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(54) Title: IL-2ALPHA RECEPTOR SUBUNIT BINDING COMPOUNDS

(57) Abstract: Peptidyl IL-2Rα ligands and compounds comprising the IL-2Rα ligands are disclosed. The IL-2Rα ligands and compounds such as synthetic monomers, homodimers, or heteromers and recombinant fusion proteins comprising the IL-2Rα ligands can be used as targeting or imaging agents, as diagnostics or to treat cancers and autoimmune diseases.

IL-2ALPHA RECEPTOR SUBUNIT BINDING COMPOUNDS

[1] This application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional Application No. 62/856,305 filed on June 3, 2019, which is incorporated by reference in its entirety.

FIELD

[2] The present disclosure relates to peptidyl IL-2Rα ligands and to compounds having a peptidyl IL-2Rα ligand. Compounds such as synthetic monomers, homodimers, heteromers, and recombinant fusion proteins comprising the IL-2Rα ligands can be used as targeting agents, imaging agents, diagnostic agents, and as therapeutics to treat cancer and autoimmune diseases.

SEQUENCE LISTING

[3] The Sequence Listing associated with this application is filed in electronic format *via* EFS-Web and is incorporated by reference in its entirety.

BACKGROUND

[4] Interleukin-2 (IL-2) plays a crucial role in regulating immune responses and maintaining peripheral self-tolerance by having both immuno-stimulatory and immuno-regulatory functions. IL-2 acts primarily as a T cell growth factor and is essential for the proliferation and survival of T cells as well as the generation of effector and memory T cells. IL-2 is a four α-helical bundle cytokine that belongs to a family of structurally related cytokines that includes IL-4, IL-7, IL-9, IL-15, and IL-21. IL-2 is produced by activated $CD4^+$ T cells in response to antigen stimulation and can also be produced by $CD8^+$ T cells and innate immune cells such as activated dendritic cells (DCs) and natural killer (NK) cells.

[5] IL-2 binds to various forms of the IL-2 receptor (IL-2R), notably the monomeric, dimeric, and trimeric forms. Monomeric IL-2R consists of the membrane-associated IL-2Rα (CD25) chain, which also exists in a soluble form; however, it is not capable of inducing signaling events. The trimeric IL-2R consists of IL-2Rα, IL2-Rβ (CD122), and IL-2Rγ, also known as the common γ-chain (γc) or CD132 and is shared by all members of the IL-2 cytokine family. Dimeric IL-2R comprises the IL-2Rγc and IL-2Rβ subunits. In contrast to monomeric IL-2R, both the dimeric and trimeric IL-2 receptors lead to a downstream signaling cascade upon IL-2 binding. IL-2 binds with high affinity to the trimeric IL-2R but with low-moderate affinity to the dimeric IL-2R, varying the sensitivity of the cell to IL-2. Additionally, IL-2 can bind to IL-2Rα expressed on the surface of activated dendritic cells for *trans* presentation to neighboring cells including antigen-specific naïve T cells and NK cells that express both IL-2Rβ and IL-2Rγc subunits. This *trans* presentation of IL-2 has been shown to facilitate initial high affinity IL-2 signaling, required early in the immune response to prime naive T-cells to produce IL-2.

[6] IL-2 is first captured by IL-2Rα, bringing about a conformational change to IL-2, increasing its affinity for IL-2Rβ. Association of IL-2 with the IL-2Rαγc subunits induces the dimerization of the signaling motifs in the cytoplasmic tails of IL-2Rβ and IL-2Rγc leading to the

phosphorylation/activation of the Janus kinases, JAK1 and JAK3, which in turn exert kinase activity on key tyrosine residues in the tail of the IL-2Rβ subunit.

[7] Downstream signaling occurs *via* three major pathways, the JAK-STAT pathway, the phosphoinositide 3-kinase (PI3K)-AKT pathway, and the mitogen-activated protein kinase (MAPK) pathway. These pathways ultimately result in the transcription of target genes that contribute to IL-2-dependent biological actions, through the recruitment of the adaptor protein Shc and the transcription factor STAT5. Target genes of IL-2 signaling include *cyclin D2, bcl-2, fasL, cd25* (encoding IL-2Rα), *socs1-2*, and the IL-2 silencing gene prdm1, which encodes for the transcription factor, BLIMP1. The production of the negative regulator of IL-2 BLIMP1 is essential for maintaining the balance between effector T cells and Treg cells, which is crucial for immune homeostasis.

[8] IL-2 plays a dual role in T cell activation by stimulating the proliferation and differentiation of T cells as well as by maintaining and expanding the population of immuno-suppressive Treg cells. The conventional naïve CD4+ and CD8+ T cells express the dimeric IL-2R, and therefore require a high concentration of IL-2 to induce their initial proliferation. Once activated, these T cells express the high-affinity trimeric IL-2R, driving the differentiation of the cells into either effector (Teff) or memory cells. This differentiation depends on the strength and duration of the IL-2 signal.

[9] During the primary expansion of $CD8^+$ T cells due to low-moderate levels of IL-2, a subset of $CD8^+$ T cells will differentiate into memory T cells. They do this by downregulating CD25 and upregulating CD127 (IL-7R) and CD62 (L-selectin), which are crucial receptors for secondary responses upon re-infection. During an acute infection, sustained high levels of IL-2 leads to a rapid up-regulation of CD25, and the differentiation of CD8+ cells into cytotoxic effector cells. The upregulation induces an IL-2 driven expression of the death receptor *fas* and *fasL*, causing activation-induced cell death (AICD) upon pathogen clearance. For $CD4^+$ T cells, the activation of STAT5 signaling by IL-2 influences their differentiation into multiple helper T cell populations, including Th1, Th2, and Th17 by regulating the expression of the appropriate receptors for each response.

[10] Homeostatic or background levels of IL-2 are essential for the survival and function of Treg cells by maintaining the expression of FOXP3 and CD25. Treg cells naturally occur in the thymus and upon contact with self-peptides become activated. Additionally, Treg cells can be generated by stimulation of conventional $CD4^+$ T cells upon interaction with antigens in peripheral lymphoid organs. Because Treg cells do not produce IL-2, Treg cells are dependent on IL-2 producing cells such as conventional T cells. Additionally, due to the high expression of IL-2Rα (CD25) Treg cells are able to consume and limit the systemic concentration of IL-2, ensuring the regulation of the immune balance. In the absence of IL-2, the number of Treg cells decreases and the number of effector T cells increases, leading to an enhanced susceptibility to autoimmune and inflammatory disorders. Therefore, the unique activation of Treg cells at low levels of IL-2, which does not activate $CD4^+$ or $CD8^+$ T cells, has allowed for the development of IL-2 as a therapeutic in autoimmune and inflammatory diseases.

[11] The production of IL-2 from both arms of the immune system highlights the importance of IL-2 in the early stages of infection, as well as the secondary adaptive response. Furthermore, the dual functions of IL-2 in both protective immunity and in immune tolerance allows IL-2 to be a potential therapeutic as both an immune stimulant for cancer treatment and as an immune suppressor for the treatment of autoimmune disease.

SUMMARY

[12] According to the present invention, IL-2Rα ligands bind to the human IL-2Rα subunit with an IC_{50} of less than 100 μM.

[13] According to the present invention, compounds comprise an IL-2Rα ligand according to the present invention.

[14] According to the present invention, pharmaceutical compositions comprise an IL-2Rα ligand according to the present invention; a compound according to the present invention; or a combination of any of the foregoing.

[15] According to the present invention, methods of treating cancer in a patient, comprise administering to a patient in need of such treatment a therapeutically effective amount of a pharmaceutical composition according to the present invention.

[16] According to the present invention, methods of treating an autoimmune disease in a patient, comprise administering to a patient in need of such treatment, a therapeutically effective amount of a pharmaceutical composition according to the present invention.

[17] According to the present invention, methods of screening compounds for IL-2α activity, comprise contacting a cell with an IL-2Rα ligand according to the present invention; the compound according to the present invention; or a combination of any of any of the foregoing wherein the cell expresses an IL-2α subunit; and contacting the cell with a test compound; and determining the activity of the test compound.

[18] According to the present invention, methods of treating a disease in a patient, wherein the IL-2 receptor signaling pathway is associated with the etiology of the disease, comprise administering to a patient in need of such treatment a therapeutically effective amount of a compound comprising an IL-2Rα ligand according to the present invention, or a pharmaceutical composition thereof.

[19] According to the present invention, methods of treating a disease in a patient, wherein activating the IL-2 receptor is effective in treating the disease, comprise administering to a patient in need of such treatment a therapeutically effective amount of a compound comprising an IL-2Rα ligand according to the present invention or a pharmaceutical composition thereof.

[20] According to the present invention, methods of treating a disease in a patient, wherein inhibiting the IL-2 receptor is effective in treating the disease, comprise administering to a patient in need of such treatment a therapeutically effective amount of a compound comprising an IL-2Rα ligand according to the present invention or a pharmaceutical composition thereof.

[21] According to the present invention, methods of treating a disease in a patient, wherein modulating the activity of the IL-2Rα subunit is effective in treating the disease, comprise administering to a patient in need of such treatment a therapeutically effective amount of a compound comprising an IL-2Rα ligand according to the present invention or a pharmaceutical composition thereof.

[22] According to the present invention, methods of treating a disease in a patient, wherein inhibiting binding to the IL-2Rα subunit is effective in treating the disease, comprise administering to a patient in need of such treatment a therapeutically effective amount of a compound comprising an IL-2Rα ligand according to the present invention or a pharmaceutical composition thereof.

[23] According to the present invention, methods of treating a disease in a patient, wherein the etiology of the disease is associated with activation of Treg cells, comprise administering to a patient in need of such treatment a therapeutically effective amount of a compound comprising an IL-2Rα ligand according to the present invention or a pharmaceutical composition thereof.

[24] According to the present invention, methods of treating a disease in a patient, wherein the etiology of the disease is associated with cells exhibiting a high IL-2Rα expression, comprise administering to a patient in need of such treatment a therapeutically effective amount of a compound comprising an IL-2Rα ligand according to the present invention or a pharmaceutical composition thereof.

[25] According to the present invention, methods of imaging cells expressing the IL-2Rα subunit comprise administering to a patient an effective amount of a compound comprising an IL-2Rα ligand according to the present invention.

[26] According to the present invention, methods of diagnosing a disease in a patient wherein the disease is associated with cells expressing the IL-2Rα subunit comprise administering to a patient an effective amount of a compound comprising an IL-2Rα ligand according to the present invention.

[27] According to the present invention, methods of targeting a compound to cells expressing the IL-2Rα subunit comprise administering to a patient an effective amount of a compound comprising an IL-2Rα ligand according to the present invention.

[28] According to the present invention, methods of delivering a cytotoxic compound to cells expressing the IL-2Rα subunit comprise administering to a patient an effective amount of a compound comprising a cytotoxic moiety and an IL-2Rα ligand according to the present invention.

DETAILED DESCRIPTION

[29] A dash ("–") that is not between two letters or symbols is used to indicate a point of attachment for a moiety or substituent. For example, $–X^1–X^2–$ denotes amino acids X^1 and X^2 covalently bonded through a single bond.

[30] "Affinity" refers to strength of the binding interaction between a single biomolecule to its ligand/binding partner. Affinity is expressed as the IC_{50}.

[31] "Agonist" refers to a biologically active ligand or compound that binds to its complementary biologically active receptor or subunit and activates the receptor to cause a biological response mediated by the receptor, or to enhance a preexisting biological activity mediated by the receptor.

[32] "Partial agonist" refers to a compound that provides a level of activation, that is, for example, less than 75% of maximum activation, less than 50%, less than 25%, less than 10%, or less than 1% of the maximum activation. A partial IL-2R agonist exhibits a level of activation that is less than the level of activation provided by IL-2.

[33] "Antagonist" refers to a biologically active ligand or compound that binds to its complementary receptor or subunit and blocks or reduces a biological response of the receptor.

[34] Amino acid residues are abbreviated as follows: alanine is Ala or A; arginine is Arg is R; asparagine is Asn or N; aspartic acid is Asp or D; cysteine is Cys or C; glutamic acid is Glu or E; glutamine is Gln or Q; glycine is Gly or G; histidine is His or H; isoleucine is Ile or I; leucine is Leu or L; lysine is Lys or K; methionine is Met or M; phenylalanine is Phe or F; proline is Pro or P; serine is Ser or S; threonine is Thr or T; tryptophan is Trp or W; tyrosine is Tyr or Y; and valine is Val or V.

[35] "Non-natural amino acids" include, for example, β-amino acids, homo-amino acids, proline and pyruvic acid derivatives, histidine derivatives with alkyl or heteroatom moieties attached to the imidazole ring, amino acids with pyridine-containing side chains, 3-substituted alanine derivatives, glycine derivatives, ring-substituted phenylalanine and tyrosine derivatives, and *N*-methyl amino acids.

[36] Amino acids having a large hydrophobic side chain include isoleucine (I), leucine (L), methionine (M), valine (V), phenylalanine (F), tyrosine (Y), and tryptophan (W).

[37] Amino acids having a small hydrophobic side chain include alanine (A), glycine (G), proline (P), serine (S), and threonine (T).

[38] Amino acids having a basic side chain include arginine (R), lysine (K), and histidine (H).

[39] Amino acids having an acidic side chain include aspartate (D) and glutamate (E).

[40] Amino acids having a polar/neutral side chain include histidine (H), asparagine (N), glutamine (Q), serine (S), threonine (T), and tyrosine (Y).

[41] Amino acids having an aromatic side chain include phenylalanine (F), histidine (H), tryptophan (W), and tyrosine (Y).

[42] Amino acids having a hydroxyl side chain include serine (S), threonine (T), or tyrosine (Y).

[43] "Conservative amino acid substitution" means that amino acids within each of the following groups can be substituted with another amino acid within the group: amino acids having a small hydrophobic side chain comprising alanine (A), glycine (G), proline (P), serine (S), and threonine (T); amino acids having a hydroxyl-containing side chain comprising serine (S), threonine (T), and tyrosine (Y); amino acids having an acidic side chain comprising aspartate (D) and glutamate (E); amino acids comprising a polar-neutral side chain comprising histidine (H), asparagine (N), glutamine (Q), serine (S), threonine (T), and tyrosine (Y); amino acids having a basic side chain comprising

arginine (R), lysine (K), and histidine (H); amino acids having a large hydrophobic side chain comprising isoleucine (I), leucine (L), methionine (M), valine (V), phenylalanine (F), tyrosine (Y), and tryptophan (W); and amino acids having an aromatic side chain comprising phenylalanine (F), histidine (H), tryptophan (W), and tyrosine (Y).

[44] "Expression" as used herein generally refers to expression of construct such as an IL-2 receptor or the outer surface of a cell.

[45] Molecular weight refers to the number average molecular weight as determined by gel permeation chromatography using a polystyrene standard.

[46] A linker refers to a moiety that binds at least one IL-2R ligand such as an IL-2Rα ligand, an IL-2Rβ ligand, and/or an IL-2Rγc ligand. A linker can bind to another IL-2R ligand which can be the same IL-2R ligand or a different IL-2R ligand. A linker can also bind to one or more additional moieties and/or compounds that can provide a desired physiological function. A linker can be divalent or multivalent. A linker can be hydrolytically stable or may be cleavable such as a physiologically hydrolyzable or enzymatically degradable linkage. A linker can bind IL-2R ligands to form dimers, trimers, or higher order multi-ligand peptides (heteromers) and compounds.

[47] A "physiologically cleavable" or "hydrolyzable" or "degradable" bond refers to a bond that reacts with water (*i.e.*, is hydrolyzed) under physiological conditions. The tendency of a bond to hydrolyze in water will depend not only on the general type of linkage connecting two central atoms but also on the substituents attached to these central atoms. Suitable hydrolytically unstable or weak linkages include but are not limited to carboxylate ester, phosphate ester, anhydrides, acetals, ketals, acyloxyalkyl ether, imines, orthoesters, peptides and oligonucleotides.

[48] An "enzymatically degradable linkage" refers to a linkage that can be degraded or cleaved by one or more enzymes.

[49] A "hydrolytically stable" linkage or bond refers to a chemical bond, such as a covalent bond, that is substantially stable in water such that the chemical bond does not undergo hydrolysis under physiological conditions to any appreciable extent over an extended period of time. Examples of hydrolytically stable linkages include, for example, carbon-carbon bonds (*e.g.*, in aliphatic chains), ethers, amides, urethanes, and the like. Generally, a hydrolytically stable linkage is one that exhibits a rate of hydrolysis of less than about 1% to 2% per day under physiological conditions.

[50] An "IL-2Rβ ligand" refers to a peptide capable of binding to the IL-2Rβ subunit of a mammalian IL-2 receptor, such as a human IL-2 receptor, with an affinity (IC_{50}) less than 100 μM. Suitable IL-2Rβ ligands are disclosed, for example, in U.S. Application Publication No. 2020/0040034 A1 and in U.S. Provisional Application No. 62/930,758 filed on November 5, 2019, each of which is incorporated by reference in its entirety.

[51] An "IL-2Rγc ligand" refers to a peptide capable of binding to the IL-2Rγc subunit of a mammalian IL-2 receptor, such as a human IL-2 receptor, with an affinity (IC_{50}) less than 100 μM. IL-2Rγc ligands are disclosed in U.S. Application Publication No. 2020/0040036 A1 and in U.S.

Provisional Application No. 62/930,758 filed on November 5, 2019, each of which is incorporated by reference in its entirety.

[52] An "IL-2Rα ligand" refers to a peptide capable of binding to the IL-2Rα subunit of a mammalian IL-2 receptor, such as a human IL-2 receptor, with an affinity (IC_{50}) less than 100 μM.

[53] The "human IL-2Rβ ligand" refers to a peptide capable of binding to the IL-2Rβ subunit of the human IL-2 receptor with an affinity less than 100 μM.

[54] The "human IL-2Rγc ligand" refers to a peptide capable of binding to the IL-2Rγc subunit of a mammalian IL-2 receptor with an affinity (IC_{50}) less than 100 μM.

[55] The "human IL-2Rα ligand" comprises refers to a peptide capable of binding to the IL-2Rα subunit of the human IL-2 receptor with an affinity (IC_{50}) less than 100 μM.

[56] The "human IL-2Rβ subunit" refers to NP_000869.1.

[57] The "human IL-2Rγc subunit" refers to NP_000197.1.

[58] The "human IL-2Rα subunit" refers to NP_001295172.1 and/or NP_001295171.1,

[59] An "IL-2R binding fusion protein" refers to a protein made by recombinant DNA technology in which the translational reading frame of an IL-2R ligand is fused to that of another protein ("IL-2R binding fusion partner") to produce a single recombinant polypeptide. An IL-2R fusion protein can comprise an IL-2Rα ligand, an IL-2Rβ ligand, and/or an IL-2Rγc ligand. An IL-2R binding fusion protein can be produced as a disulfide-linked dimer, joined together by disulfide bonds located in the hinge region. An IL-2R ligand binding fusion protein can include a peptide linker such as an amino acid sequence located between two proteins comprising a fusion protein, such that the linker peptide sequence is not derived from either partner protein. Peptide linkers can be incorporated into fusion proteins as spacers to promote proper protein folding and stability of the component protein moieties, to improve protein expression, or to enable better bioactivity of the two fusion partners.

[60] Bioisosteres are atoms or molecules that fit the broadest definition for isosteres and is used interchangeably with the term isostere. The concept of bioisosterism is based on the concept that single atom, groups, moieties, or whole molecules, which have chemical and physical similarities produce similar biological effects. A bioisostere of a parent compound can still be recognized and accepted by its appropriate target, but its functions will be altered as compared to the parent molecule. Parameters affected with bioisosteric replacements include, for example, size, conformation, inductive and mesomeric effects, polarizability, capacity for electrostatic interactions, charge distribution, H-bond formation capacity, pKa (acidity), solubility, hydrophobicity, lipophilicity, hydrophilicity, polarity, potency, selectivity, reactivity, or chemical and metabolic stability, ADME (absorption, distribution, metabolism, and excretion). Although common in pharmaceuticals, carboxyl groups or carboxylic acid functional groups ($-CO_2H$) in a parent molecule may be replaced with a suitable surrogate or (bio)isostere to overcome chemical or biological shortcomings while retaining the desired attributes of the parent molecule bearing one or more carboxyl groups or carboxylic acid functional groups ($-CO_2H$).

[61] "Isostere" or "isostere replacement" refers to any amino acid or other analog moiety having physiochemical and/or structural properties similar to a specified amino acid. An "isostere" or "suitable isostere" of an amino acid is another amino acid of the same class, wherein amino acids belong to the following classes based on the propensity of the side chain to be in contact with polar solvent like water: hydrophobic (low propensity to be in contact with water), polar or charged (energetically favorable contact with water). Examples of charged amino acid residues include lysine (+), arginine (+), aspartate (–) and glutamate (–). Examples of polar amino acids include serine, threonine, asparagine, glutamine, histidine and tyrosine. Illustrative hydrophobic amino acids include alanine, valine, leucine, isoleucine, proline, phenylalanine, tryptophan, cysteine and methionine. The amino acid glycine does not have a side chain and is hard to assign to one of the above classes. However, glycine is often found at the surface of proteins, often within loops, providing high flexibility to these regions, and an isostere may have a similar feature. Proline has the opposite effect, providing rigidity to the protein structure by imposing certain torsion angles on the segment of the polypeptide chain. An isostere can be a derivative of an amino acid, *e.g.*, a derivative having one or more modified side chains as compared to the reference amino acid.

[62] "Cyclized" refers to a reaction in which one part of a peptide or polypeptide molecule becomes linked to another part of the peptide or polypeptide molecule to form a closed ring, such as by forming a disulfide bridge or other similar bond, *e.g.*, a lactam bond. A peptide monomer compound or monomer subunit of peptide dimer compounds can be cyclized *via* an intramolecular bond between two amino acid residues present in the peptide monomer or monomer subunit.

[63] "Patient" refers to a mammal, for example, a human.

[64] "Peptide" refers to a polymer in which the monomers are α-amino acids joined together through amide bonds. A peptide can comprise less than 100 amino acids, less than 50 amino acids, less than 40 amino acids, less than 30 amino acids, or less than 20 amino acids. A peptide can comprise naturally-occurring α-amino acids, non-naturally occurring amino acids, or a combination thereof.

[65] "Polypeptide" refers to a polymer in which the monomers are α-amino acids joined together through amide bonds and comprise greater than 50 amino acids.

[66] "N-terminus" refers to the end of a peptide or polypeptide, such as an N-terminus of a peptide or polypeptide comprising an IL-2Rα ligand, an IL-2Rβ ligand, and/or an IL-2Rγc ligand, that bears an amino group in contrast to the carboxyl end bearing a carboxyl acid group.

[67] "C-terminus" refers to the end of a peptide or polypeptide, such as a C-terminus of a peptide or polypeptide comprising an IL-2Rα ligand, an IL-2Rβ ligand, and/or an IL-2Rγc ligand, that bears a carboxylic acid group in contrast to the amino terminus bearing an amino group.

[68] "Pharmaceutically acceptable" refers to approved or approvable by a regulatory agency of the Federal or a state government or listed in the U.S. Pharmacopoeia or other generally recognized pharmacopoeia for use in animals, and more particularly in humans.

[69] "Pharmaceutically acceptable salt" refers to a salt of a compound, which possesses the desired pharmacological activity of the parent compound. Such salts include acid addition salts, formed with inorganic acids and one or more protonable functional groups such as primary, secondary, or tertiary amines within the parent compound. Examples of inorganic acids include hydrochloric acid, hydrobromic acid, sulfuric acid, nitric acid, phosphoric acid, and the like. Salts can be formed with organic acids such as acetic acid, propionic acid, hexanoic acid, cyclopentanepropionic acid, glycolic acid, pyruvic acid, lactic acid, malonic acid, succinic acid, malic acid, maleic acid, fumaric acid, tartaric acid, citric acid, benzoic acid, 3-(4-hydroxybenzoyl) benzoic acid, cinnamic acid, mandelic acid, methanesulfonic acid, ethanesulfonic acid, 1,2-ethane-disulfonic acid, 2-hydroxyethanesulfonic acid, benzenesulfonic acid, 4-chlorobenzenesulfonic acid, 2-naphthalenesulfonic acid, 4-toluenesulfonic acid, camphorsulfonic acid, 4-methylbicyclo[2.2.2]-oct-2-ene-1-carboxylic acid, glucoheptonic acid, 3-phenylpropionic acid, trimethylacetic acid, tertiary butylacetic acid, lauryl sulfuric acid, gluconic acid, glutamic acid, hydroxynaphthoic acid, salicylic acid, stearic acid, muconic acid, and the like. A salt can be formed when one or more acidic protons present in the parent compound are replaced by a metal ion, *e.g.*, an alkali metal ion, an alkaline earth ion, or an aluminum ion, or combinations thereof; or coordinates with an organic base such as ethanolamine, diethanolamine, triethanolamine, and *N*-methylglucamine. A pharmaceutically acceptable salt can be the hydrochloride salt. A pharmaceutically acceptable salt can be the sodium salt. A compound can have two or more ionizable groups, a pharmaceutically acceptable salt comprises one or more counterions, such as a bi-salt, for example, a dihydrochloride salt.

[70] "Pharmaceutically acceptable salt" includes hydrates and other solvates, as well as salts in crystalline or non-crystalline form. Where a particular pharmaceutically acceptable salt is disclosed, it is understood that the particular salt (*e.g.*, a hydrochloride salt) is an example of a salt, and that other salts may be formed using techniques known to one of skill in the art. Additionally, one of skill in the art would be able to convert the pharmaceutically acceptable salt to the corresponding compound, free base and/or free acid, using techniques generally known in the art.

[71] "Pharmaceutically acceptable vehicle" refers to a pharmaceutically acceptable diluent, a pharmaceutically acceptable adjuvant, a pharmaceutically acceptable excipient, a pharmaceutically acceptable carrier, or a combination of any of the foregoing with which a compound provided by the present disclosure may be administered to a patient and which does not destroy the pharmacological activity thereof and which is non-toxic when administered in doses sufficient to provide a therapeutically effective amount of the compound.

[72] "Solvate" refers to a molecular complex of a compound with one or more solvent molecules in a stoichiometric or non-stoichiometric amount. Such solvent molecules are those commonly used in the pharmaceutical arts, which are known to be innocuous to a patient, *e.g.*, water, ethanol, and the like. A molecular complex of a compound or moiety of a compound and a solvent can be stabilized by non-covalent intra-molecular forces such as, for example, electrostatic forces, van der Waals

forces, or hydrogen bonds. The term "hydrate" refers to a solvate in which the one or more solvent molecules is water.

[73] "Pharmaceutical composition" refers to a compound comprising an IL-2Rα ligand provided by the present disclosure or a pharmaceutically acceptable salt thereof and at least one pharmaceutically acceptable vehicle, with which the compound or pharmaceutically acceptable salt thereof is administered to a patient. Pharmaceutically acceptable vehicles are known in the art.

[74] "Disease" refers to a disease, disorder, condition, or symptom of any of the foregoing.

[75] "Preventing" or "prevention" refers to a reduction in risk of acquiring a disease or disorder (*i.e.*, causing at least one of the clinical symptoms of the disease not to develop in a patient that may be exposed to or predisposed to the disease but does not yet experience or display symptoms of the disease). In some embodiments, "preventing" or "prevention" refers to reducing symptoms of the disease by taking the compound in a preventative fashion. The application of a therapeutic for preventing or prevention of a disease of disorder is known as prophylaxis.

[76] "Prodrug" refers to a derivative of a therapeutic compound that requires a transformation within the body to release the active therapeutic compound. Prodrugs are frequently, although not necessarily, pharmacologically inactive until converted to the parent drug.

"Promoiety" refers to a group bonded to a therapeutic compound, typically to a functional group of the therapeutic compound, *via* bond(s) that are cleavable under specified conditions of use. The bond(s) between the drug and promoiety may be cleaved by enzymatic or non-enzymatic means. Under the conditions of use, for example following administration to a patient, the bond(s) between the therapeutic compound and the promoiety may be cleaved to release the parent therapeutic compound. The cleavage of the promoiety may proceed spontaneously, such as *via* a hydrolysis reaction, or it may be catalyzed or induced by another agent, such as by an enzyme, by light, by acid, or by a change of or exposure to a physical or environmental parameter, such as a change of temperature or pH. The agent may be endogenous to the conditions of use, such as an enzyme present in the systemic circulation of a patient to which the prodrug is administered or the acidic conditions of the stomach or the agent may be supplied exogenously.

[77] "Substantially" means, for example, greater than 90%, greater than 95%, greater than 98%, or greater than 99%.

[78] "Therapeutically effective amount" refers to the amount of a compound that, when administered to a patient for treating a disease, or at least one of the clinical symptoms of a disease, is sufficient to affect such treatment of the disease or symptom thereof. A "therapeutically effective amount" may vary depending, for example, on the compound, the disease and/or symptoms of the disease, the severity of the disease and/or symptoms of the disease or disorder, the age, weight, and/or health of the patient to be treated, and the judgment of the prescribing physician. A therapeutically effective amount in any given instance may be ascertained by those skilled in the art or capable of determination by routine experimentation.

[79] "Therapeutically effective dose" refers to a dose that provides effective treatment of a disease or disorder in a patient. A therapeutically effective dose may vary from compound to compound, and from patient to patient, and may depend upon factors such as the condition of the patient and the route of delivery. A therapeutically effective dose may be determined in accordance with routine pharmacological procedures known to those skilled in the art.

[80] "Treating" or "treatment" of a disease refers to arresting or ameliorating a disease or at least one of the clinical symptoms of a disease or disorder, reducing the risk of acquiring a disease or at least one of the clinical symptoms of a disease, reducing the development of a disease or at least one of the clinical symptoms of the disease or reducing the risk of developing a disease or at least one of the clinical symptoms of a disease. "Treating" or "treatment" also refers to inhibiting the disease, either physically, (*e.g.*, stabilization of a discernible symptom), physiologically, (*e.g.*, stabilization of a physical parameter), or both, and to inhibiting at least one physical parameter or manifestation that may or may not be discernible to the patient. In certain embodiments, "treating" or "treatment" refers to delaying the onset of the disease or at least one or more symptoms thereof in a patient who may be exposed to or predisposed to a disease or disorder even though that patient does not yet experience or display symptoms of the disease.

[81] "Tregs" or "Treg cells" refer to regulatory T-cells. Regulatory T-cells are a class of T-cells that suppress the activity of other immune cells and are defined using flow cytometry by the cell marker phenotypes CD4+/CD25+/FOXP3+, CD4+CD25+CD127lo, or CD4+/CD25+/FOXP3+/CD127lo. Because FOXP3 is an intracellular protein and requires cell fixation and permeabilization for staining, the cell surface phenotype CD4+CD25+CD127lo- can be used for defining live Tregs. Tregs also include various Treg subclasses, such as tTregs (thymus-derived) and pTregs (peripherally-derived, differentiated from naive T-cells in the periphery). All Tregs express the IL-2Rαβγc receptor, do not produce IL-2 and are dependent on IL-2 for growth. Tregs are more potently activated by an IL-2Rαβγc-biased agonist. Treg cells are characterized by expression of the α-subunit of the IL-2 receptor (CD25) and the transcription factor forkhead box P3 (FOXP3) and play a critical role in the induction and maintenance of peripheral self-tolerance to antigens, including those expressed by tumors. Treg cells require IL-2 for their function and development and induction of their suppressive characteristics.

[82] "CD4+T cells" are a type of lymphocyte that functions to coordinate the immune response by stimulating other immune cells such as macrophages, B lymphocytes (B cells), CD8 lymphocytes (CD8 cells) to fight infection. CD4+T cells recognize peptides presented on MHC Class II molecules, which are found on antigen-presenting cells.

[83] "CD8+ (cytotoxic) T-cells" are generated in the thymus and express the T-cell receptor. Cytotoxic T-cells express a dimeric co-receptor, CD8, which typically comprises one CD8α and one CD8β chain. CD8+T-cells recognize peptides presented by MHC Class 1 molecules found on all nucleated cells. The CD8 heterodimer binds to a conservative portion of MHC Class 1 during T-

cell/antigen presenting cell interactions. CD8+T-cells (cytotoxic T lymphocytes, or CTLs) are important for immune defense against intracellular pathogens including viruses and bacteria, and for tumor surveillance.

[84] "Functional activation of Treg cells" is defined as an IL-2-mediated response in Tregs. Assays for functional activation of Treg cells include stimulation of pSTAT5, Treg cell proliferation, and stimulation of the levels of Treg effector proteins.

[85] "Polypeptide" refers to a molecule composed of monomers (amino acids) linearly linked by amide bonds (also known as peptide bonds). The term "polypeptide" refers to any chain of two or more amino acids and does not refer to a specific length of the product. Thus, peptides, dipeptides, tripeptides, oligopeptides, "protein," "amino acid chain," or any other term used to refer to a chain of two or more amino acids, are included within the definition of "polypeptide," and the term "polypeptide" may be used instead of, or interchangeably with any of these terms. The term "polypeptide" is also intended to refer to the products of post-expression modifications of the polypeptide including, for example, glycosylation, acetylation, phosphorylation, amidation, derivatization by known protecting/blocking groups, proteolytic cleavage, and/or modification by non-naturally occurring amino acids. A polypeptide may be derived from a natural biological source or produced by recombinant technology but is not necessarily translated from a designated nucleic acid sequence. A polypeptide may be generated in any manner, including by recombinant methods or by chemical synthesis. A polypeptide may have, for example, more than 100 amino acids, more than 200 amino acids, more than 500 amino acids, more than 1,000 amino acids, or more than 2,000 amino acids. Polypeptides may have a defined three-dimensional structure, although they do not necessarily have such structure. Polypeptides with a defined three-dimensional structure are referred to as folded, and polypeptides which do not possess a defined three-dimensional structure, but rather can adopt a large number of different conformations and are referred to as unfolded.

[86] "Polynucleotide" refers to an isolated nucleic acid molecule or construct, *e.g.*, messenger RNA (mRNA), virally-derived RNA, or plasmid DNA (pDNA). A polynucleotide may comprise a conventional phosphodiester bond or a non-conventional bond, such as an amide bond, such as found in peptide nucleic acids (PNA).

[87] "Nucleic acid molecule" refers to any one or more nucleic acid segments, such as DNA or RNA fragments, present in a polynucleotide.

[88] "Vector" or "expression vector" is synonymous with "expression construct" and refers to a DNA molecule that is used to introduce and direct the expression of a specific gene to which it is operably associated in a target cell. A vector can be a self-replicating nucleic acid structure as well as a vector incorporated into the genome of a host cell into which it has been introduced. An expression vector can comprise an expression cassette. Expression vectors allow transcription of large amounts of stable mRNA. Once an expression vector is inside the target cell, the ribonucleic acid molecule or

protein that is encoded by the gene is produced by the cellular transcription and/or translation machinery. An expression vector can comprise an expression cassette that comprises polynucleotide sequences that encode an IL-2Rβγc ligand or IL-2Rβγc ligand construct provided by the present disclosure.

[89] "Host cell," "host cell line," and "host cell culture" refer to cells into which are exogenous nucleic acid has been introduced, including the progeny of such cells. Host cells include, for example, "transformants" and "transformed cells," which include the primary transformed cell and progeny derived from the primary transformed cell without regard to the number of passages.

[90] "Antibody" in the broadest sense encompasses various antibody structures including, for example, monoclonal antibodies, polyclonal antibodies, multi-specific antibodies such as bispecific antibodies, and antibody fragments that exhibit a desired antigen binding activity.

[91] "Full-length antibody," "intact antibody," and "whole antibody" refer to an antibody having a structure substantially similar to a native antibody structure or having heavy chains that contain both Fab and an Fc region.

[92] "Antibody fragment" refers to a molecule other than an intact antibody that comprises a portion of an intact antibody that binds the antigen to which the intact antibody binds. Examples of antibody fragments include Fv, Fab, Fab', Fab'-SH, F(ab')2, diabodies, linear antibodies, single-chain antibody molecules such as scFv, and multi-specific antibodies formed from antibody fragments. Diabodies are antibody fragments with two antigen binding sites that may be bivalent or bispecific. Antibody fragments can be made by various techniques, including but not limited to proteolytic digestion of an intact antibody as well as production by recombinant host cells such as *E. coli* or phage.

[93] "Fab" or "Fab region" refers to a polypeptide that comprises the VH, CHI, VL, and CL immunoglobulin domains, generally on two different polypeptide chains such as VH-CH on one chain and VL-CL on the other. Fab may refer to this region in isolation, or this region in the context of a bispecific antibody. In the context of a Fab, the Fab comprises an Fv region in addition to the CHI and CL domains.

[94] "Fv" or "Fv fragment" or "Fv region" refers to a polypeptide that comprises the VL and VH domains of an antibody (Fab). Fv regions can be formatted as both Fabs (generally two different polypeptides that also include the constant regions) and scFvs, where the vi and vh domains are combined (generally with a linker as discussed) to form an scFv.

[95] "Single chain Fv" or "scFv" refers to a variable heavy domain covalently attached to a variable light domain, generally using a scFv linker as discussed herein, to form a scFv or scFv domain. A scFv domain can be in either orientation from N- to C-terminus.

[96] "Effector function" refers to a biochemical event that results from the interaction of an antibody Fc region with an Fc receptor or ligand. Effector functions include, for example, antibody-

dependent cellular toxicity (ADCC), antibody-dependent cellular phagocytosis (ADCP), and complement-dependent cytotoxicity (CDC).

[97] "Fc" or "Fc region" or "Fc chain" refers to polypeptide comprising the constant region of an antibody, in some instances, excluding all or a portion of the first constant region immunoglobulin domain (*e.g.*, CHI) or a portion thereof, and in some cases, further excluding all or a portion of the hinge. Thus, an Fc can refer to the last two constant region immunoglobulin domains (*e.g.*, CH2 and CH3) of lgA, IgD, and IgG, the last three constant region immunoglobulin domains of IgE and IgM, and optionally, all or a portion of the flexible hinge N-terminal to these domains. For IgA and IgM, Fc may include the J chain. For IgG, the Fc chain comprises immunoglobulin domains CH2 and CH3 (Cy2 and Cy3), and optionally all or a portion of the hinge region between CHI (Cyl) and CH2 (Cy2). Although the boundaries of the Fc region may vary, the human IgG heavy chain Fc region is usually defined to include residues E216, C226, or A231 to its carboxyl-terminus, wherein the numbering is according to the EU index as in Kabat. An amino acid modification can be made to the Fc region, for example to alter binding to one or more FcyR or to the FcRn. In EU numbering for human IgG1, the CH2-CH3 domain comprises amino acids 231 to 447, and the hinge is 216 to 230. Thus, the definition of Fc chain includes both amino acids 231-447 (CH2-CH3) or 216-447 (hinge-CH2-CH3), or fragments thereof. An Fc fragment can contain fewer amino acids from either or both of the N- and C-termini that retains the ability to form a dimer with another Fc chain or Fc fragment as can be detected using standard methods, generally based on size (*e.g.*, non-denaturing chromatography, size exclusion chromatography, *etc.*). Human IgG Fc chains are of particular use, and can be the Fc chain from human IgGl, IgG2 or IgG4.

[98] "Heavy constant region" refers to the CH1-hinge-CH2-CH3 portion of an antibody or fragments thereof, excluding the variable heavy domain; in EU numbering of human IgGl, such as amino acids 118-447. "Heavy chain constant region fragment" refers to a heavy chain constant region that contains fewer amino acids from either or both of the N- and C-termini that retains the ability to form a dimer with another heavy chain constant region.

[99] "Immunoglobulin molecule" refers to a protein having the structure of a naturally occurring antibody. For example, immunoglobulins of the IgG class are heterotetrameric glycoproteins of about 150,000 Da, composed of two light chains and two heavy chains that are bonded together through disulfide bonds. From N- to C-terminus, each heavy chain has a variable region (VH), also called a variable heavy domain or a heavy chain variable domain, followed by three constant domains (CHI, CH2, and CH3), also called a heavy chain constant region. Similarly, from N- to C-terminus, each light chain has a variable region (VL), also called a variable light domain or a light chain variable domain, followed by a constant light (CL) domain, also called a light chain constant region. The heavy chain of an immunoglobulin may be assigned to one of five classes, called α (IgA), Ii (IgD), E (IgE), y (IgG), or μ (IgM), some of which may be further divided into subclasses, *e.g.*, γ1 (IgG1), γ2 (IgG2), γ3 (IgG3), γ4(gG4), α1 (IgA1) and α2 (IgA2). The light chain of an immunoglobulin may be

assigned to one of two types, kappa (k) or lambda (L), based on the amino acid sequence of its constant domain. An immunoglobulin essentially consists of two Fab molecules and an Fc chain, linked *via* the immunoglobulin hinge region.

[100] "Immunoconjugate" refers to a polypeptide molecule that includes at least one IL-2Rβγc ligand and at least one antigen binding moiety. An immunoconjugate can comprise at least one IL-2Rβγc ligand, and at least two antigen binding moieties. An immunoconjugate can comprise at least one IL-2Rβγc ligand and two antigen binding moieties joined by one or more linker sequences. An antigen binding moiety can be joined to the IL-2Rβγc ligand by a variety of interactions and in a variety of configurations.

[101] "Amino acid sequence similarity" refers to an amino acid sequence in which one or more amino acids of the amino has been replaced with a chemically similar amino acid. Examples of chemically similar amino acids include (a) amino acids having a small hydrophobic side chain such as alanine (A), glycine (G), proline (P), serine (S), or threonine (T); (b) amino acids having a hydroxyl-containing side chain such as serine (S), threonine (T), or tyrosine (Y); (c) amino acids having an acidic side chain such as aspartate (D) or glutamate (E); (d) amino acids having a polar-neutral side chain such as histidine (H), asparagine (N), glutamine (Q), serine (S), threonine (T), or tyrosine (Y); (e) amino acids having a basic side chain such as arginine (R), lysine (K), or histidine (H); (f) amino acids having a large hydrophobic side chain such as isoleucine (I), leucine (L), methionine (M), valine (V), phenylalanine (F), tyrosine (Y), or tryptophan (W); and (g) amino acids having an aromatic side chain comprising phenylalanine (F), histidine (H), tryptophan (W), or tyrosine (Y). A chemically similar amino acid can comprise a naturally occurring amino acid or a non-natural amino acid.

[102] "Percent (%) sequence similarity" refers to amino acid sequences in which one or more amino acids of a reference amino acid sequence is replaced with an amino acid such as a chemically similar amino acid. For example, given a reference amino acid sequence – RDQYYPCWMAQLGELCDLDEVF–, the amino acid sequence – RDQYYPCYMAQLGELCDLEEVF– represents a similar amino acid sequence, in which an amino acid W having aromatic side chain is replaced with chemically similar amino acid Y having an aromatic side chain; and an amino acid D having an acidic side chain is replaced with chemically similar amino acid E having an acidic side chain. Referring to this example, the similar amino acid sequence, which consists of 22 amino acids, has a 90.9% (2/22) sequence similarity to the reference amino acid sequence.

[103] "Percent (%) sequence similarity" is determined by comparing the number of amino acids that are the same in a subject peptide ligand and a reference peptide ligand. A peptide ligand provided by the present disclosure can comprise, for example, greater than 70%, greater than 80%, or greater than 90% sequence similarity to a reference peptide ligand. For example, based on a reference peptide ligand having SEQ ID NO: 1030, peptide ligands having SEQ-ID NOS: 1031-1036, have either 1, 2, 3, 4, or 5 amino acid in which an amino acid of the reference peptide has been substituted or replaced

with the amino acid, alanine. Peptide ligands having SEQ ID NOS: 1031-1036 are characterized by a 95%, 90%, 85%, 80%, 75%, or 70% sequence similarity, respectively, to the amino acid sequence of the reference peptide.

SEQ ID NO: 1030	Y	P	C	W	L	A	R	V	G	E	L	C	D	L	D	S	G	D	V	H
SEQ ID NO: 1031	A	P	C	W	L	A	R	V	G	E	L	C	D	L	D	S	G	D	V	H
SEQ ID NO: 1032	A	P	C	A	L	A	R	V	G	E	L	C	D	L	D	S	G	D	V	H
SEQ ID NO: 1033	A	P	C	A	L	A	A	V	G	E	L	C	D	L	D	S	G	D	V	H
SEQ ID NO: 1034	A	P	C	A	L	A	A	V	G	A	L	C	D	L	D	S	G	D	V	H
SEQ ID NO: 1035	A	P	C	A	L	A	A	V	G	A	L	C	D	L	A	S	G	D	V	H
SEQ ID NO: 1036	A	P	C	A	L	A	A	V	G	A	L	C	D	L	A	A	G	D	V	H

[104] A peptide ligand provided by the present disclosure can have an amino acid sequence in which from 1 to 5 amino acids of a reference amino acid sequence is substituted with another amino acid.

[105] For example, a peptide ligand derived from a reference peptide ligand can have from 1 to 5 amino acid substitutions, from 1 to 4, from 1 to 3, or from 1 to 2 amino acid substitutions. For example, a peptide ligand derived from a reference peptide ligand can have 1 amino acid substitution, 2 amino acid substitutions, 3 amino acid substitutions, 4 amino acid substitutions, or 5 amino acid substitutions.

[106] An amino acid substitution can be independent of the other amino acid substitutions.

[107] Each amino acid substitution can independently be a conservative amino acid substitution or a non-conservative amino acid substitution.

[108] A conservative amino acid substitution refers to one of the following amino acid substitutions: amino acids having a small hydrophobic side chain comprising alanine (A), glycine (G), proline (P), serine (S), or threonine (T); amino acids having a hydroxyl-containing side chain comprising serine (S), threonine (T), or tyrosine (Y); amino acids having an acidic side chain comprising aspartate (D) or glutamate (E); amino acids having a polar-neutral side chain comprising histidine (H), asparagine (N), glutamine (Q), serine (S), threonine (T), or tyrosine (Y); amino acids having a basic side chain comprising arginine (R), lysine (K), or histidine (H); amino acids having a large hydrophobic side chain comprising isoleucine (I), leucine (L), methionine (M), valine (V), phenylalanine (F), tyrosine (Y), or tryptophan (W); and amino acids having an aromatic side chain comprising phenylalanine (F), histidine (H), tryptophan (W), or tyrosine (Y).

[109] For example, a reference peptide ligand can have the amino acid sequence of SEQ ID NO: 1020.

SEQ ID NO: 1020	Y	W	C	W	M	A	Q	V	G	E	L	C	D	L
SEQ ID NO: 1021	Y	H	C	W	M	A	Q	V	G	E	L	C	D	L
SEQ ID NO: 1022	Y	H	C	W	M	G	Q	V	G	E	L	C	D	L

SEQ ID NO: 1023	Y	H	C	W	M	G	Q	M	G	E	L	C	D	L	
SEQ ID NO: 1024	Y	H	C	W	M	G	Q	M	G	E	L	C	E	L	
SEQ ID NO: 1025	Y	H	C	W	M	G	Q	M	G	E	L	C	E	M	

[110] Peptide ligands having SEQ ID NOS: 1021-1025 represent peptide ligands in which the reference peptide ligand having SEQ ID NO: 1020 has been substituted with from 1 to 5 conservative amino acid substitutions, respectively.

[111] A peptide ligand provided by the present disclosure can comprise a truncated peptide ligand. A truncated peptide ligand refers to a peptide ligand in which from 1 to 5 amino acids have independently been removed from the N-terminus, the C-terminus, or from both the N-terminus and the C-terminus of the corresponding reference peptide ligand. A truncated peptide ligand derived from the corresponding reference peptide ligand can independently have from 1 to 5 amino acids, such as from 1 to 4 amino acids, from 1 to 3 amino acids, or from 1 to 2 amino acids independently removed from the N-terminus, the C-terminus, or from both the N-terminus and the C-terminus of the reference peptide ligand. A truncated peptide ligand derived from the corresponding reference peptide ligand can independently have 1 amino acid, 2 amino acids, 3 amino acids, 4 amino acids, or 5 amino acids removed from the N-terminus, the C-terminus, or from both the N-terminus and the C-terminus of the reference peptide ligand.

[112] For example, a reference peptide ligand can have the amino acid sequence of SEQ ID. NO: 1000. Examples of truncated peptide ligands derived from the reference peptide ligand of SEQ ID. NO: 1000 include truncated peptide ligands of amino acid sequence of SEQ ID NOS: 1001-1008.

SEQ ID NO: 1000	M	G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V	D
SEQ ID NO: 1001		G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V	D
SEQ ID NO: 1002			F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V	D
SEQ ID NO: 1003				Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V	D
SEQ ID NO: 1004	M	G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V	
SEQ ID NO: 1005	M	G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S		
SEQ ID NO: 1006	M	G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L			
SEQ ID NO: 1007		G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V	
SEQ ID NO: 1008			F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L			

[113] The truncated peptide ligands of SEQ ID NOS: 1001-1003 have amino acids removed from the N-terminus of the reference peptide ligand; truncated peptide ligands of SEQ ID NOS: 1004-1006 have amino acids removed from the C-terminus of the reference peptide ligand; and truncated peptide ligands of SEQ ID NOS: 1007-1008 have amino acids removed from both the N-terminus and from the C-terminus of the reference peptide ligand.

[114] As another example, a reference peptide ligand can comprise an amino acid sequence of Formula (A):

$$-X^{500}-X^{501}-C-X^{502}-X^{503}-X^{504}-X^{505}-X^{506}-X^{507}-X^{508}-X^{509}-C-X^{510}-X^{511}- \quad (A)$$

where each –X– independently represents an amino acid. Amino acid sequences of Formula (A1)-(A2) represent truncated peptide ligands derived from the reference peptide ligand comprising the amino acid seqeunce of Formula (A):

$$–X^{501}–C–X^{502}–X^{503}–X^{504}–X^{505}–X^{506}–X^{507}–X^{508}–X^{509}–C–X^{510}–X^{511}– \quad (A1)$$

$$–C–X^{502}–X^{503}–X^{504}–X^{505}–X^{506}–X^{507}–X^{508}–X^{509}–C–X^{510}–X^{511}– \quad (A2)$$

$$–C–X^{502}–X^{503}–X^{504}–X^{505}–X^{506}–X^{507}–X^{508}–X^{509}–C– \quad (A3)$$

$$–X^{502}–X^{503}–X^{504}–X^{505}–X^{506}–X^{507}–X^{508}–X^{509}–C–X^{510}– \quad (A4)$$

$$–X^{502}–X^{503}–X^{504}–X^{505}–X^{506}–X^{507}–X^{508}–X^{509}– \quad (A5)$$

[115] A peptide ligand provided by the present disclosure can comprise an amino acid sequence in which from 1 to 3 glycines are independently bonded to the N-terminus, to the C-terminus, or to both the N-terminus and to the C-terminus of a reference peptide ligand.

SEQ ID NO: 1010				K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	
SEQ ID NO: 1011			G	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	
SEQ ID NO: 1012		G	G	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	
SEQ ID NO: 1013	G	G	G	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	
SEQ ID NO: 1014				K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	G
SEQ ID NO: 1015				K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	G	G
SEQ ID NO: 1016				K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	G	G	G
SEQ ID NO: 1017			G	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	G		
SEQ ID NO: 1018		G	G	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	G		

[116] For example, reference peptide ligand can have SEQ ID NO: 1010. Peptide ligands having SEQ ID NOS: 1011-1013 have from 1 to 3 glycines bonded to the N-terminus of the reference peptide ligand, respectively; peptide ligands having SEQ ID NOS: 1014-1016 have from 1 to 3 glycines bonded to the C-terminus of the reference peptide ligand, respectively; and peptide ligands having SEQ ID NOS: 1017-1018 independently have 1 or 2 glycines bonded to both the N-terminus and to the C-terminus of the reference peptide ligand.

[117] A peptide ligand can comprise a truncated peptide ligand in which from 1 to 3 glycines are independently bonded to the N-terminus, to the C-terminus, or to both the N-terminus and to the C-terminus of a reference truncated peptide ligand.

[118] "IL-2Rα binding compound" refers to an IL-2Rα ligand provided by the present disclosure, a tandem IL-2Rα ligand provided by the present disclosure, an IL-2Rα ligand construct provided by the present disclosure, and a construct comprising at least one IL-2Rα ligand and at least one IL-2Rβ ligand and/or at least one IL-2Rγc ligand.

[119] The expression "at least one" refers to "one or more." For example, the expression at least can refer to from 1 to 10, from 1 to 8, from 1 to 6, from 1 to 5, from 1 to 4, from 1 to 3, or from 1 to 2. For example, the expression at least one can refer to 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10.

[120] Reference is now made in detail to certain embodiments of compounds, compositions, and methods. The disclosed embodiments are not intended to be limiting of the claims. To the contrary, the claims are intended to cover all alternatives, modifications, and equivalents.

[121] IL-2Rα ligands provided by the present disclosure comprise peptide domains amenable to strategies to simultaneously mask peripheral bioactivity, target delivery to a tumor, selectively activate cytotoxic anti-tumor cells, and direct IL-2 receptor activation at tumor sites. IL-2R agonists provided by the present disclosure can also be used to treat autoimmune diseases.

[122] IL-2R agonists can be designed to selectively activate a specific form of the IL-2 receptor. The small peptide IL-2R ligands, having an amino acid sequence that is unrelated to that of the natural cytokine, can selectively bind to and activate the IL-2Rα subunit to produce therapeutic IL-2 activity. Because the IL-2R peptidyl ligands are small, *i.e.* from 5 to 20 amino acids, with very low immunogenic potential, the small peptidyl IL-2R ligands can be incorporated into compounds to enhance therapeutic efficacy. For example, this allows the affinity of the IL-2R peptidyl ligands for each of the three IL-2R subunits to be tuned to direct the responsiveness of a particular immune cell population and affords flexibility to chemically target to tumor sites and mediate the immune response.

[123] IL-2Rβ and IL-2Rγc ligands and compounds comprising IL-2Rβ and IL-2Rγc ligands are disclosed in U.S. Provisional Application No. 62/715,097 filed on August 6, 2018, which is incorporated by reference in its entirety.

[124] The present disclosure is directed to IL-2Rα ligands and compounds comprising IL-2Rα ligands. The compounds comprising IL-2Rα ligands can comprise an IL-2Rβ ligand and/or an IL-2Rγc ligand.

[125] Peptides having a binding affinity to IL-2Rα can be identified by random peptide diversity generating systems in conjunction with an affinity enrichment process, for example, using peptides on plasmids or peptides on phage systems.

[126] Peptidyl ligands for the IL-2Rα subunit can be identified from highly complex peptide diversity libraries such as phage display libraries, optimized by peptide synthesis, and can be assembled into monomers, homo-oligomers, heteromers or incorporated into other compounds.

[127] Random peptides can be presented either on the surface of a phage particle, as part of a fusion protein comprising either the pIII or the pVIII coat protein of a phage fd derivative (peptides on phage) or as a fusion protein with the LacI peptide fusion protein bound to a plasmid (peptides on plasmids). The phage or plasmids, including the DNA encoding the peptides, can be identified and isolated by an affinity enrichment process using an immobilized IL-2Rα subunit. The affinity enrichment process, sometimes referred to as "panning," involves multiple rounds of incubating the

phage or plasmids with the immobilized receptor, collecting the phage or plasmids that bind to the receptor (along with the accompanying DNA), and producing more of the phage or plasmids (along with the accompanying LacI-peptide fusion protein) collected. The extracellular domain (ECD) of the IL-2Rα subunit can be used during panning.

[128] After several rounds of affinity enrichment, the phage or plasmids and accompanying peptides were examined by ELISA to determine if the peptides bind specifically to the IL-2Rα subunit. The assay can be performed using methods similar to those described for the affinity enrichment process, except that after removing unbound phage, the wells can be treated with an antibody such as a rabbit anti-phage antibody and then with alkaline phosphatase (AP)-conjugated goat anti-rabbit antibody. The amount of alkaline phosphatase in each well can be determined by standard methods.

[129] By comparing test wells with control wells without the IL-2 receptor, one can determine whether the fusion proteins bind to the receptor specifically. The phage pools found to bind to the IL-2Rα subunit can be screened in a colony lift probing format using monovalent or divalent receptor.

[130] IL-2Rα ligands can also be identified by panning subunits fused to Fc.

[131] Peptides found to bind specifically to the IL-2Rα subunit can then be synthesized as the free peptide (*e.g.*, no phage) and tested in a blocking assay. The blocking assay can be carried out in a similar manner to the ELISA, except that IL-2Rα binding peptides or a reference peptide at different concentrations can be added to the wells before the tracer peptide or fusion protein (the control wells can be of two types: (1) no receptor; and (2) IL-2Rα subunit binding peptide or reference peptide). Tracer peptides or fusion protein in the instance comprise IL-2Rα ligands wherein binding to immobilized IL-2Rα can be detected by a variety of means.

[132] The IL-2 receptor, as well as its extracellular domain, can be produced in recombinant host cells.

[133] Screening methods used to identify peptides that bind to IL-2Rα can involve first identifying lead peptides which bind to the extracellular domain of the receptor and then synthesizing other peptides which resemble the lead peptides. Specifically, using a pIII or pVIII-based peptides on a phage system, a random library can be screened to discover a phage that presents a peptide that binds to the IL-2Rα subunit. The phage DNAs are sequenced to determine the sequences of the peptides displayed on the surface of the phages.

[134] For example, clones capable of specific binding to IL-2Rα can be identified from a random linear or disulfide-bridged cyclic 10-mer pVIII library and a random linear or disulfide-bridged cyclic 12-mer pVIII library. The sequences of these peptides can serve as the basis for the construction of other peptide libraries designed to contain a high frequency of derivatives of the initially identified peptides. These libraries can be synthesized so as to favor the production of peptides that differ from the binding peptide in only a few residues. This approach involves the synthesis of an oligonucleotide with the binding peptide coding sequence, except that rather than using pure preparations of each of

the four nucleoside triphosphates in the synthesis, mixtures of the four nucleoside triphosphates (*i.e.*, 55% of the "correct" nucleotide, and 15% each of the other three nucleotides is one preferred mixture for this purpose and 70% of the "correct" nucleotide and 10% of each of the other three nucleotides is another preferred mixture for this purpose) can be used so as to generate derivatives of the binding peptide coding sequence.

[135] A variety of strategies can be used to derivatize the lead peptides by making "mutagenesis on a theme" libraries, including a pVIII phagemid mutagenesis library based on the consensus sequence and mutagenized at 70:10:10:10 frequency with 5 NNK codons on each terminus (probing with radiolabeled monovalent receptor and with or without peptide elution).

[136] The "peptides on plasmids" method can also be used for peptide screening and mutagenesis studies. According to this approach, random peptides can be fused at the C-terminus of LacI through expression from a plasmid vector carrying the fusion gene. Linkage of the LacI-peptide fusion to its encoding DNA occurs *via* the lacO sequences on the plasmid, forming a stable peptide-LacI-plasmid complex that can be screened by affinity purification (panning) on an immobilized receptor. The plasmids thus isolated can then be reintroduced into *E. coli* by electroporation to amplify the selected population for additional rounds of screening, or for the examination of individual clones.

[137] In addition, random peptide screening and mutagenesis studies can be performed using a modified C-terminal Lac-I display system in which display valency was reduced ("headpiece dimer" display system). The libraries can be screened, and the resulting DNA inserts were cloned as a pool into a maltose binding protein (MBP) vector allowing their expression as a C-terminal fusion protein. Crude cell lysates from randomly picked individual MBP fusion clones were then assayed for IL-2Rα binding in an ELISA format, as discussed above.

[138] A variety of methods can be used to evaluate IC_{50} values. For example, an equilibrium binding ELISA assay, an IL-2 or IL-2Rα peptide tracer, was used to determine whether the peptides inhibit the binding of the tracer to the extracellular domain of IL-2α. The IC_{50} value can be determined using the free peptide, which optionally can be C-terminally amidated, or can be prepared as an ester or other carboxy amide. To recreate the exact sequence displayed by the phage, the N-terminal and C-terminal amino acids of the synthetic peptides are often preceded by one or two glycine residues. These glycines are not believed to be necessary for binding or activity.

[139] Synthetic peptide library technologies such as DNA-encoded peptide libraries can also be used.

[140] In general, peptides and peptidomimetics having an IC_{50} of greater than 100 μM lack sufficient binding affinity to be useful in imaging, targeting, diagnostic, and therapeutic applications. For imaging, targeting or diagnostic purposes, peptides and peptidomimetics can have an IC_{50}, for example, of 1 μM or less and, for pharmaceutical purposes, peptides and peptidomimetics can have an IC_{50}, for example, less than 100 μm, or less than 100 nm.

[141] An IL-2Rα ligand provided by the present disclosure can bind to the human IL-2Rα subunit with an IC_{50}, for example, of less than 100 μM, less than 10 μM, less than 1 μM, less than 0.1 μM, or less than 0.01 μM.

[142] An IL-2Rα ligand provided by the present disclosure can bind to the human IL-2Rα subunit with an IC_{50}, for example, from 1 pM to 100 μM, from 10 pM to 10 μM, from 100 pM to 1 μM, from, 0.001 μM to 1 μM, or from 0.01 μM to 1 μM.

[143] An IL-2Rα ligand provided by the present disclosure can bind to a mammalian IL-2Rα subunit with an IC_{50}, for example, of less than 100 μM, less than 10 μM, less than 1 μM, less than 0.1 μM, or less than 0.01 μM.

[144] An IL-2Rα ligand provided by the present disclosure can bind to a mammalian IL-2Rα subunit with an IC_{50}, for example, from 1 pM to 100 μM, from 10 pM to 10 μM, from 100 pM to 1 μM, from, 0.001 μM to 1 μM, or from 0.01 μM to 1 μM.

[145] An IL-2Rα ligand provided by the present disclosure can have an amino acid sequence of any one of SEQ ID NOS: 1-307 and 400-422.

[146] An IL-2Rα ligand provided by the present disclosure can have greater than 70% sequence similarity, greater than 75% sequence similarity, greater than 80%, greater than 85% sequence similarity, greater than 90% sequence similarity, or greater than 95% sequence similarity to any one of SEQ ID NOS: 1-307 and 400-422.

[147] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (1) (SEQ ID NO: 1):

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (1)$$

wherein,

X^1 can be selected from an amino acid comprising a large hydrophobic side chain or an aromatic side chain;

X^2 can be selected from an amino acid comprising a large hydrophobic side chain;

X^3 can be selected from an amino acid;

X^4 can be selected from an amino acid comprising a large hydrophobic side chain;

X^5 can be selected from an amino acid comprising a small hydrophobic side chain or a polar/neutral side chain;

X^6 can be selected from an amino acid comprising a large hydrophobic side chain;

X^7 can be selected from an amino acid comprising a large hydrophobic side chain;

X^8 can be selected from an amino acid comprising a large hydrophobic side chain;

X^9 can be selected from an amino acid comprising a small hydrophobic side chain;

X^{10} can be selected from an amino acid comprising a polar/neutral side chain;

X^{11} can be selected from an amino acid comprising a large hydrophobic side chain; and

X^{12} can be selected from an amino acid comprising a large hydrophobic side chain.

[148] In IL-2Rα ligands of Formula (1), X^1 can be selected from F, H, I, L, M, V, W, and Y.

[149] In IL-2Rα ligands of Formula (1), X^2 can be selected from F, I, L, M, V, W, and Y.

[150] In IL-2Rα ligands of Formula (1), X^3 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[151] In IL-2Rα ligands of Formula (1), X^4 can be selected from F, I, L, M, V, W, and Y.

[152] In IL-2Rα ligands of Formula (1), X^5 can be selected from H, N, Q, Y, A, G, P, S, and T.

[153] In IL-2Rα ligands of Formula (1), X^6 can be selected from F, I, L, M, V, W, and Y.

[154] In IL-2Rα ligands of Formula (1), X^7 can be selected from F, I, L, M, V, W, and Y.

[155] In IL-2Rα ligands of Formula (1), X^9 can be selected from A, G, P, S, and T.

[156] In IL-2Rα ligands of Formula (1), X^{10} can be selected from H, N, Q, S, T, and Y.

[157] In IL-2Rα ligands of Formula (1), X^{11} can be selected from F, I, L, M, V, W, and Y.

[158] In IL-2Rα ligands of Formula (1), X^{12} can be selected from F, I, L, M, V, W, and Y.

[159] In IL-2Rα ligands of Formula (1), X^1 can be selected from L, W, and F.

[160] In IL-2Rα ligands of Formula (1), X^2 can be selected from D, A, L, and V.

[161] In IL-2Rα ligands of Formula (1), X^3 can be selected from L, V, H, P, and E.

[162] In IL-2Rα ligands of Formula (1), X^4 can be selected from T, D, and W.

[163] In IL-2Rα ligands of Formula (1), X^5 can be selected from Y, W, P, and Q.

[164] In IL-2Rα ligands of Formula (1), X^6 can be selected from D, S, V, and A.

[165] In IL-2Rα ligands of Formula (1), X^7 can be selected from E and Y.

[166] In IL-2Rα ligands of Formula (1), X^8 can be selected from L and F.

[167] In IL-2Rα ligands of Formula (1), X^9 can be selected from L, R, and S.

[168] In IL-2Rα ligands of Formula (1), X^{10} can be selected from A, R, and Q.

[169] In IL-2Rα ligands of Formula (1), X^{11} can be selected from C, R, V, and M.

[170] In IL-2Rα ligands of Formula (1), X^{12} can be selected from T, L, and M.

[171] In IL-2Rα ligands of Formula (1), X^1 can be F.

[172] In IL-2Rα ligands of Formula (1), X^2 can be selected from L and V.

[173] In IL-2Rα ligands of Formula (1), X^3 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[174] In IL-2Rα ligands of Formula (1), X^4 can be W.

[175] In IL-2Rα ligands of Formula (1), X^5 can be P.

[176] In IL-2Rα ligands of Formula (1), X^6 can be V.

[177] In IL-2Rα ligands of Formula (1), X^7 can be Y.

[178] In IL-2Rα ligands of Formula (1), X^8 can be F.

[179] In IL-2Rα ligands of Formula (1), X^9 can be S.

[180] In IL-2Rα ligands of Formula (1), X^{10} can be Q.

[181] In IL-2Rα ligands of Formula (1), X^{11} can be selected from N and V.

[182] In IL-2Rα ligands of Formula (1), X^{12} can be selected from L and M.

[183] In IL-2Rα ligands of Formula (1), X^1 can be F, X^4 can be W, X^5 can be P, X^6, can be V, X^7 can be Y, X^8 can be F, X^9 can be S, and X^{10} can be Q.

[184] In IL-2Rα ligands of Formula (1),

X^1 can be F;

X^2 can be selected from F, H, I, L, M, V, W, and Y;

X^3 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^4 can be W;

X^5 can be selected from H, N, Q, Y, A, G, P, S, and T;

X^6 can be V;

X^7 can be Y;

X^8 can be F;

X^9 can be S;

X^{10} can be Q;

X^{11} can be selected from F, I, L, M, V, W, and Y; and

X^{12} can be selected from F, I, L, M, V, W, and Y.

[185] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 2 to SEQ ID NO: 6:

SEQ ID NO: 2	L	D	L	T	Y	D	E	L	L	A	C	T
SEQ ID NO: 3	W	A	Y	D	W	S	C	F	R	R	R	L
SEQ ID NO: 4	F	L	H	W	P	V	Y	F	C	Q	V	M
SEQ ID NO: 5	F	L	P	W	P	V	Y	F	S	Q	V	L
SEQ ID NO: 6	F	V	E	W	Q	A	Y	F	S	Q	M	M

[186] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 1 to SEQ ID NO: 6.

[187] An IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 1 to SEQ ID NO: 6, or a truncated amino acid sequence of any one of SEQ ID NO: 1 to SEQ ID NO: 6, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[188] An IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 1 to SEQ ID NO: 6, or a truncated amino acid sequence of any one of SEQ ID NO: 1 to SEQ ID NO: 6, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[189] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (2) (SEQ ID NO: 7):

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (2)$$

wherein,

X^1 can be selected from an amino acid comprising a large hydrophobic side chain;

X^2 can be selected from an amino acid comprising a large hydrophobic side chain;

X^3 can be selected from an amino acid comprising a small hydrophobic side chain;

X^4 can be selected from an amino acid comprising a large hydrophobic side chain;

X^5 can be selected from an amino acid comprising an acidic side chain;

X^6 can be selected from an amino acid comprising an acidic side chain;

X^7 can be selected from an amino acid comprising a large hydrophobic side chain;

X^8 can be selected from an amino acid comprising a large hydrophobic side chain;

X^9 can be selected from an amino acid;

X^{10} can be selected from an amino acid comprising a polar/neutral side chain;

X^{11} can be selected from an amino acid comprising a large hydrophobic side chain;

and

X^{12} can be selected from an amino acid comprising a large hydrophobic side chain.

[190] In IL-2Rα ligands of Formula (2), X^1 can be selected from F, I, L, M, V, W, and Y.

[191] In IL-2Rα ligands of Formula (2), X^2 can be selected from F, I, L, M, V, W, and Y.

[192] In IL-2Rα ligands of Formula (2), X^3 can be selected from A, G, P, S, and T.

[193] In IL-2Rα ligands of Formula (2), X^4 can be selected from F, I, L, M, V, W, and Y.

[194] In IL-2Rα ligands of Formula (2), X^6 can be selected from D and E.

[195] In IL-2Rα ligands of Formula (2), X^7 can be selected from F, I, L, M, V, W, and Y.

[196] In IL-2Rα ligands of Formula (2), X^8 can be selected from F, I, L, M, V, W, and Y.

[197] In IL-2Rα ligands of Formula (2), X^9 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[198] In IL-2Rα ligands of Formula (2), X^{10} can be selected from H, N, Q, S, T, and Y.

[199] In IL-2Rα ligands of Formula (2), X^{11} can be selected from F, I, L, M, V, W, and Y.

[200] In IL-2Rα ligands of Formula (2), X^{12} can be selected from F, I, L, M, V, W, and Y.

[201] In IL-2Rα ligands of Formula (2), X^1 can be F.

[202] In IL-2Rα ligands of Formula (2), X^2 can be selected from I, L, and V.

[203] In IL-2Rα ligands of Formula (2), X^3 can be P.

[204] In IL-2Rα ligands of Formula (2), X^4 can be W.

[205] In IL-2Rα ligands of Formula (2), X^5 can be selected from P, D, and E.

[206] In IL-2Rα ligands of Formula (2), X^6 can be selected from V and E.

[207] In IL-2Rα ligands of Formula (2), X^7 can be Y.

[208] In IL-2Rα ligands of Formula (2), X^8 can be F.

[209] In IL-2Rα ligands of Formula (2), X^9 can be S, A, K, and L.

[210] In IL-2Rα ligands of Formula (2), X^{10} can be Q.

[211] In IL-2Rα ligands of Formula (2), X^{11} can be selected from V, I, and L.

[212] In IL-2Rα ligands of Formula (2), X^{12} can be selected from L and M.

[213] In IL-2Rα ligands of Formula (2), X^1 can be F.

[214] In IL-2Rα ligands of Formula (2), X^2 can be selected from L and V.

[215] In IL-2Rα ligands of Formula (2), X^3 can be P.

[216] In IL-2Rα ligands of Formula (2), X^4 can be W.

[217] In IL-2Rα ligands of Formula (2), X^5 can be D.

[218] In IL-2Rα ligands of Formula (2), X^6 can be E.

[219] In IL-2Rα ligands of Formula (2), X^7 can be Y.

[220] In IL-2Rα ligands of Formula (2), X^8 can be F.

[221] In IL-2Rα ligands of Formula (2), X^9 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[222] In IL-2Rα ligands of Formula (2), X^9 can be S.

[223] In IL-2Rα ligands of Formula (2), X^{10} can be Q.

[224] In IL-2Rα ligands of Formula (2), X^{11} can be selected from I, L, and V.

[225] In IL-2Rα ligands of Formula (2), X^{12} can be L.

[226] In IL-2Rα ligands of Formula (2), X^1 can be F, X^3 can be P, X^4 can be W, X^5 can be D, X^6, can be E, X^7 can be Y, X^8 can be F, X^{10} can be Q, and X^{12} can be L.

[227] In IL-2Rα ligands of Formula (2),

X^1 can be F;

X^2 can be selected from F, I, L, M, V, W, and Y;

X^3 can be P;

X^4 can be W;

X^5 can be selected from D and P;

X^6 can be E;

X^7 can be Y;

X^8 can be F;

X^9 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} can be Q;

X^{11} can be selected from F, I, L, M, V, W, and Y; and

X^{12} can be L.

[228] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 8 to SEQ ID NO: 15:

SEQ ID NO: 8	F	I	P	W	D	E	Y	F	A	Q	L	L

SEQ ID NO: 9	F	I	P	W	D	E	Y	F	K	Q	V	L
SEQ ID NO: 10	F	V	P	W	D	V	Y	F	S	Q	I	L
SEQ ID NO: 11	F	I	P	W	D	E	Y	F	K	Q	V	L
SEQ ID NO: 12	F	V	P	W	P	E	Y	F	L	Q	I	M
SEQ ID NO: 13	F	I	P	W	E	E	Y	F	S	Q	L	L
SEQ ID NO: 14	F	I	P	W	P	E	Y	F	S	Q	L	L
SEQ ID NO: 15	F	V	P	W	D	E	Y	F	L	Q	I	L

[229] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 7 to SEQ ID NO: 15.

[230] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 7 to SEQ ID NO: 15, or a truncated amino acid sequence of any one of SEQ ID NO: 7 to SEQ ID NO: 15, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[231] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 7 to SEQ ID NO: 15, or a truncated amino acid sequence of any one of SEQ ID NO: 7 to SEQ ID NO: 15, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[232] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (3a) (SEQ ID NO: 16), the amino acid sequence of Formula (3b) (SEQ ID NO: 17), or the amino acid sequence of Formula (3c) (SEQ ID NO: 18):

$$–X^5–X^6–X^7–X^8– \quad (3a)$$

$$–X^3–C–X^5–X^6–X^7–X^8–C–X^{10}– \quad (3b)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}– \quad (3c)$$

wherein,

X^1 can be selected from an amino acid comprising a large hydrophobic side chain;

X^2 can be selected from an amino acid comprising a large hydrophobic side chain;

X^3 can be selected from an amino acid;

X^4 can be C;

X^5 can be selected from an amino acid comprising a small hydrophobic side chain;

X^6 can be selected from an amino acid;

X^7 can be selected from an amino acid;

X^8 can be selected from amino acid comprising a small hydrophobic side chain;

X^9 can be C;

X^{10} can be selected from an amino acid comprising a basic side chain or a polar/neutral side chain;

X^{11} can be selected from an amino acid comprising a small hydrophobic side chain; and

X^{12} can be selected from an amino acid.

[233] In IL-2Rα ligands of Formula (3a)-(3c), X^1 can be selected from F, I, L, M, V, W, and Y.

[234] In IL-2Rα ligands of Formula (3a)-(3c), X^2 can be selected from F, I, L, M, V, W, and Y.

[235] In IL-2Rα ligands of Formula (3a)-(3c), X^3 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[236] In IL-2Rα ligands of Formula (3a)-(3c), X^4 can be C.

[237] In IL-2Rα ligands of Formula (3a)-(3c), X^5 can be selected from A, G, P, S, and T.

[238] In IL-2Rα ligands of Formula (3a)-(3c), X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[239] In IL-2Rα ligands of Formula (3a)-(3c), X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[240] In IL-2Rα ligands of Formula (3a)-(3c), X^8 can be selected from A, G, P, S, and T.

[241] In IL-2Rα ligands of Formula (3a)-(3c), X^9 can be C.

[242] In IL-2Rα ligands of Formula (3a)-(3c), X^{10} can be selected from H, K, N, Q, R, S, T, and Y.

[243] In IL-2Rα ligands of Formula (3a)-(3c), X^{11} can be selected from A, G, P, S, and T.

[244] In IL-2Rα ligands of Formula (3a)-(3c), X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[245] In IL-2Rα ligands of Formula (3a)-(3c), X^1 can be selected from Y and W.

[246] In IL-2Rα ligands of Formula (3a)-(3c), X^2 can be V.

[247] In IL-2Rα ligands of Formula (3a)-(3c), X^3 can be selected from M and I.

[248] In IL-2Rα ligands of Formula (3a)-(3c), X^4 can be C.

[249] In IL-2Rα ligands of Formula (3a)-(3c), X^5 can be S.

[250] In IL-2Rα ligands of Formula (3a)-(3c), X^6 can be A.

[251] In IL-2Rα ligands of Formula (3a)-(3c), X^7 can be F, L, V, and M.

[252] In IL-2Rα ligands of Formula (3a)-(3c), X^8 can be G.

[253] In IL-2Rα ligands of Formula (3a)-(3c), X^9 can be C.

[254] In IL-2Rα ligands of Formula (3a)-(3c), X^{10} can be selected from K and R.

[255] In IL-2Rα ligands of Formula (3a)-(3c), X^{11} can be selected from S, P, and A.

[256] In IL-2Rα ligands of Formula (3a)-(3c), X^{12} can be selected from I, L, M, F, and W.

[257] In IL-2Rα ligands of Formula (3a)-(3c), X^1 can be selected from F, I, L, M, V, W, and Y.

[258] In IL-2Rα ligands of Formula (3a)-(3c), X^2 can be V.

[259] In IL-2Rα ligands of Formula (3a)-(3c), X^3 can be selected from F, I, L, M, V, W, and Y.

[260] In IL-2Rα ligands of Formula (3a)-(3c), X^4 can be C.

[261] In IL-2Rα ligands of Formula (3a)-(3c), X^5 can be G.

[262] In IL-2Rα ligands of Formula (3a)-(3c), X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[263] In IL-2Rα ligands of Formula (3a)-(3c), X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[264] In IL-2Rα ligands of Formula (3a)-(3c), X^8 can be G.

[265] In IL-2Rα ligands of Formula (3a)-(3c), X^9 can be C.

[266] In IL-2Rα ligands of Formula (3a)-(3c), X^{10} can be R.

[267] In IL-2Rα ligands of Formula (3a)-(3c), X^{11} can be S.

[268] In IL-2Rα ligands of Formula (3a)-(3c), X^{12} can be selected from F, I, L, M, V, W, and Y.

[269] In IL-2Rα ligands of Formula (3a)-(3c), X^{12} can be V.

[270] In IL-2Rα ligands of Formula (3a)-(3c), X^2 can be V, X^4 can be C, X^5 can be G, X^8 can be G, X^9 can be C, X^{10} can be R, and X^{11} can be S.

[271] In IL-2Rα ligands of Formula (3a)-(3c),

X^1 can be selected from F, I, L, M, V, W, and Y;

X^2 can be V;

X^3 can be selected from F, I, L, M, V, W, and Y;

X^4 can be C;

X^5 can be G;

X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be G;

X^9 can be C;

X^{10} can be R;

X^{11} can be S; and

X^{12} can be selected from F, I, L, M, V, W, and Y.

[272] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 19 to SEQ ID NO: 24:

SEQ ID NO: 19	F	V	L	C	G	L	Q	G	C	R	G	S
SEQ ID NO: 20	K	V	I	C	G	W	D	G	C	R		
SEQ ID NO: 21	L	V	F	C	G	K	N	G	C	H	S	G
SEQ ID NO: 22	V	V	L	C	T	P	K	G	C	R	S	A
SEQ ID NO: 23	Y	V	M	C	S	A	F	G	C	K	S	I
SEQ ID NO: 24	F	V	H	C	T	L	L	G	C	W	S	G

[273] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 16 to SEQ ID NO: 24.

[274] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 16 to SEQ ID NO: 24, or a truncated amino acid sequence of

any one of SEQ ID NO: 16 to SEQ ID NO: 24, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[275] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 16 to SEQ ID NO: 24, or a truncated amino acid sequence of any one of SEQ ID NO: 16 to SEQ ID NO: 24, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[276] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (4a) (SEQ ID NO: 25), the amino acid sequence of Formula (4b) (SEQ ID NO: 26), the amino acid sequence of Formula (4c) (SEQ ID NO: 27), or the amino acid sequence of Formula (4d) (SEQ ID NO: 28):

$$–X^5–X^6–X^7–X^8–X^9– \quad (4a)$$

$$–X^3–C–X^5–X^6–X^7–X^8–C–X^{10}– \quad (4b)$$

$$–X^2–X^3–C–X^5–X^6–X^7–X^8–C–X^{10}–X^{11}– \quad (4c)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}– \quad (4d)$$

wherein,

X^1 can be selected from an amino acid comprising a large hydrophobic side chain;

X^2 can be selected from an amino acid comprising a large hydrophobic side chain;

X^3 can be selected from an amino acid comprising a large hydrophobic side chain;

X^4 can be C;

X^5 can be selected from an amino acid comprising a small hydrophobic side chain;

X^6 can be selected from an amino acid comprising a small hydrophobic side chain;

X^7 can be selected from an amino acid comprising a large hydrophobic side chain;

X^8 can be selected from an amino acid comprising a small hydrophobic side chain;

X^9 can be C;

X^{10} can be selected from an amino acid comprising a basic side chain;

X^{11} can be selected from an amino acid comprising a small hydrophobic side chain;

and

X^{12} can be selected from an amino acid comprising a large hydrophobic side chain.

[277] In IL-2Rα ligands of Formula (4a)-(4d), X^1 can be selected from F, I, L, M, V, W, and Y.

[278] In IL-2Rα ligands of Formula (4a)-(4d), X^2 can be selected from F, I, L, M, V, W, and Y.

[279] In IL-2Rα ligands of Formula (4a)-(4d), X^3 can be selected from F, I, L, M, V, W, and Y.

[280] In IL-2Rα ligands of Formula (4a)-(4d), X^4 can be C.

[281] In IL-2Rα ligands of Formula (4a)-(4d), X^5 can be selected from A, G, P, S, and T.

[282] In IL-2Rα ligands of Formula (4a)-(4d), X^6 can be selected from A, G, P, S, and T.

[283] In IL-2Rα ligands of Formula (4a)-(4d), X^7 can be selected from F, I, L, M, V, W, and Y.

[284] In IL-2Rα ligands of Formula (4a)-(4d), X^8 can be selected from A, G, P, S, and T.

[285] In IL-2Rα ligands of Formula (4a)-(4d), X^9 can be C.

[286] In IL-2Rα ligands of Formula (4a)-(4d), X^{10} can be selected from H, K, and R.

[287] In IL-2Rα ligands of Formula (4a)-(4d), X^{11} can be selected from A, G, P, S, and T.

[288] In IL-2Rα ligands of Formula (4a)-(4d), X^{12} can be selected from F, I, L, M, V, W, and Y.

[289] In IL-2Rα ligands of Formula (4a)-(4d), X^1 can be selected from Y and W.

[290] In IL-2Rα ligands of Formula (4a)-(4d), X^2 can be V.

[291] In IL-2Rα ligands of Formula (4a)-(4d), X^3 can be selected from M and I.

[292] In IL-2Rα ligands of Formula (4a)-(4d), X^4 can be C.

[293] In IL-2Rα ligands of Formula (4a)-(4d), X^5 can be S.

[294] In IL-2Rα ligands of Formula (4a)-(4d), X^6 can be A.

[295] In IL-2Rα ligands of Formula (4a)-(4d), X^7 can be selected from F, L, V, and M.

[296] In IL-2Rα ligands of Formula (4a)-(4d), X^8 can be G.

[297] In IL-2Rα ligands of Formula (4a)-(4d), X^9 can be C.

[298] In IL-2Rα ligands of Formula (4a)-(4d), X^{10} can be selected from R and K.

[299] In IL-2Rα ligands of Formula (4a)-(4d), X^{11} can be selected from S, P, and A.

[300] In IL-2Rα ligands of Formula (4a)-(4d), X^{12} can be selected from I, M, F, and W.

[301] In IL-2Rα ligands of Formula (4a)-(4d), X^1 can be W.

[302] In IL-2Rα ligands of Formula (4a)-(4d), X^2 can be V.

[303] In IL-2Rα ligands of Formula (4a)-(4d), X^3 can be I.

[304] In IL-2Rα ligands of Formula (4a)-(4d), X^4 can be C.

[305] In IL-2Rα ligands of Formula (4a)-(4d), X^5 can be S.

[306] In IL-2Rα ligands of Formula (4a)-(4d), X^6 can be A.

[307] In IL-2Rα ligands of Formula (4a)-(4d), X^7 can be selected from F, I, L, M, V, W, and Y.

[308] In IL-2Rα ligands of Formula (4a)-(4d), X^8 can be G.

[309] In IL-2Rα ligands of Formula (4a)-(4d), X^9 can be C.

[310] In IL-2Rα ligands of Formula (4a)-(4d), X^{10} can be R.

[311] In IL-2Rα ligands of Formula (4a)-(4d), X^{11} can be S.

[312] In IL-2Rα ligands of Formula (4a)-(4d), X^{12} can be selected from F, I, L, M, V, W, and Y.

[313] In IL-2Rα ligands of Formula (4a)-(4d), X1 can be W, X^2 can be V, X^3 can be I, X^4 can be C, X^5 can be S, X^6 can be A, X^8 can be G, X^9 can be C, X^{10} can be R, and X^{11} can be S.

[314] In IL-2Rα ligands of Formula (4a)-(4d),

X^1 can be W;

X^2 can be V;

X^3 can be I;

X^4 can be C;

X^5 can be S;

X^6 can be A;

X^7 can be selected from F, I, L, M, V, W, and Y.

X^8 can be G;

X^9 can be C;

X^{10} can be selected from R and K;

X^{11} can be S; and

X^{12} can be selected from F, I, L, M, V, W, and Y.

[315] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 29 to SEQ ID NO: 36:

SEQ ID NO: 29	W	V	I	C	S	A	L	G	C	R	S	L
SEQ ID NO: 30	W	V	I	C	S	A	L	G	C	R	S	M
SEQ ID NO: 31	W	V	I	C	S	A	V	G	C	R	P	F
SEQ ID NO: 32	W	V	I	C	S	A	M	G	C	R	S	I
SEQ ID NO: 33	W	V	I	C	S	A	L	G	C	R	S	I
SEQ ID NO: 34	W	V	I	C	S	A	F	G	C	R	S	M
SEQ ID NO: 35	W	V	I	C	S	A	L	G	C	R	P	F
SEQ ID NO: 36	W	V	I	C	S	A	L	G	C	K	A	W

[316] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 25 to SEQ ID NO: 36.

[317] An IL-2Rα ligand\s provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 25 to SEQ ID NO: 36, or a truncated amino acid sequence of any one of SEQ ID NO: 25 to SEQ ID NO: 36, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[318] An IL-2Rα ligand\s provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 25 to SEQ ID NO: 36, or a truncated amino acid sequence of any one of SEQ ID NO: 25 to SEQ ID NO: 36, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[319] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (5a) (SEQ ID NO: 37), the amino acid sequence of Formula (5b) (SEQ ID NO: 38), the amino acid sequence of Formula (5c) (SEQ ID NO: 39), or the amino acid sequence of Formula (5d) (SEQ ID NO: 40):

$$–X^5–X^6–X^7–X^8–X^9– \quad (5a)$$

$$–X^3–C–X^5–X^6–X^7–X^8–X^9–C–X^{11}— \quad (5b)$$

$$–X^3–X^4–C– X^5–X^6–X^7–X^8–X^9–C–X^{11}–X^{12}– \quad (5c)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}– \quad (5d)$$

wherein,

X^1 can be selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^2 can be selected from an amino acid comprising a large hydrophobic side chain;

X^3 can be selected from an amino acid comprising a large hydrophobic side chain;

X^4 can be C;

X^5 can be selected from an amino acid comprising a small hydrophobic side chain or an acidic side chain;

X^6 can be selected from an amino acid;

X^7 can be selected from an amino acid;

X^8 can be selected from an amino acid;

X^9 can be selected from an amino acid comprising a small hydrophobic side chain;

X^{10} can be C;

X^{11} can be selected from an amino acid comprising a basic side chain; and

X^{12} can be selected from an amino acid.

[320] In IL-2Rα ligands of Formula (5a)-(5d), X^1 can be selected from F, H, I, L, M, V, W, and Y.

[321] In IL-2Rα ligands of Formula (5a)-(5d), X^2 can be selected from F, I, L, M, V, W, and Y.

[322] In IL-2Rα ligands of Formula (5a)-(5d), X^3 can be selected from F, I, L, M, V, W, and Y.

[323] In IL-2Rα ligands of Formula (5a)-(5d), X^4 can be C.

[324] In IL-2Rα ligands of Formula (5a)-(5d), X^5 can be selected from A, G, H, K, P, R, S, and T.

[325] In IL-2Rα ligands of Formula (5a)-(5d), X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[326] In IL-2Rα ligands of Formula (5a)-(5d), X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[327] In IL-2Rα ligands of Formula (5a)-(5d), X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[328] In IL-2Rα ligands of Formula (5a)-(5d), X^9 can be selected from A, G, P, S, and T.

[329] In IL-2Rα ligands of Formula (5a)-(5d), X^{10} can be C.

[330] In IL-2Rα ligands of Formula (5a)-(5d), X^{11} can be selected from H, K, and R.

[331] In IL-2Rα ligands of Formula (5a)-(5d), X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[332] In IL-2Rα ligands of Formula (5a)-(5d), X^1 can be selected from F, H, W, and Y.

[333] In IL-2Rα ligands of Formula (5a)-(5d), X^2 can be V.

[334] In IL-2Rα ligands of Formula (5a)-(5d), X^3 can be selected from F, I, L, M, V, W, and Y.

[335] In IL-2Rα ligands of Formula (5a)-(5d), X^4 can be selected from F, K, L, V, W, and H.

[336] In IL-2Rα ligands of Formula (5a)-(5d), X^5 can be V.

[337] In IL-2Rα ligands of Formula (5a)-(5d), X^5 can be selected from L, F, M, H, T, A, and I.

[338] In IL-2Rα ligands of Formula (5a)-(5d), X^5 can be C.

[339] In IL-2Rα ligands of Formula (5a)-(5d), X^6 can be selected from G, T, S, R, and K.

[340] In IL-2Rα ligands of Formula (5a)-(5d), X^6 can be selected from L, W, K, P, A, N, W, and V,

[341] In IL-2Rα ligands of Formula (5a)-(5d), X^7 can be selected from Q, D, N, K, F, L, R, G, and D,

[342] In IL-2Rα ligands of Formula (5a)-(5d), X^8 can be selected from G, N, Y, H, and G.

[343] In IL-2Rα ligands of Formula (5a)-(5d), X^9 can be G.

[344] In IL-2Rα ligands of Formula (5a)-(5d), X^{10} can be C.

[345] In IL-2Rα ligands of Formula (5a)-(5d), X^{11} can be selected from G, S, R, T, and Y.

[346] In IL-2Rα ligands of Formula (5a)-(5d), X^{12} can be selected from S, G, A, I, G, P, R, and S.

[347] In IL-2Rα ligands of Formula (5a)-(5d), X^1 can be selected from F, W, and Y.

[348] In IL-2Rα ligands of Formula (5a)-(5d), X^2 can be V.

[349] In IL-2Rα ligands of Formula (5a)-(5d), X^3 can be selected from F, I, L, M, V, W, and Y.

[350] In IL-2Rα ligands of Formula (5a)-(5d), X^4 can be C.

[351] In IL-2Rα ligands of Formula (5a)-(5d), X^5 can be selected from A, G, P, S, and T.

[352] In IL-2Rα ligands of Formula (5a)-(5d), X^5 can be selected from H, K, and R.

[353] In IL-2Rα ligands of Formula (5a)-(5d), X^5 can be S.

[354] In IL-2Rα ligands of Formula (5a)-(5d), X^6 can be selected from F, I, L, M, V, W, and Y.

[355] In IL-2Rα ligands of Formula (5a)-(5d), X^6 can be W.

[356] In IL-2Rα ligands of Formula (5a)-(5d), X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[357] In IL-2Rα ligands of Formula (5a)-(5d), X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[358] In IL-2Rα ligands of Formula (5a)-(5d), X^9 can be G.

[359] In IL-2Rα ligands of Formula (5a)-(5d), X^{10} can be C.

[360] In IL-2Rα ligands of Formula (5a)-(5d), X^{11} can be R.

[361] In IL-2Rα ligands of Formula (5a)-(5d), X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[362] In IL-2Rα ligands of Formula (5a)-(5d), X^2 can be V, X^4 can be C, X^5 can be S, X^9 can be G, X^{10} can be C, and X^{11} can be R.

[363] In IL-2Rα ligands of Formula (5a)-(5d),

X^1 can be selected from F, H, I, L, M, V, W, and Y;

X^2 can be V;

X^3 can be selected from F, I, L, M, V, W, and Y;

X^4 can be C;

X^5 can be S;

X^6 can be selected from F, I, L, M, V, W, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 can be G;

X^{10} can be C;

X^{11} can be R; and

X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[364] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 41 to SEQ ID NO: 45:

SEQ ID NO: 41	Y	V	L	C	S	N	R	N	G	C	R	P
SEQ ID NO: 42	Y	V	T	C	R	W	G	Y	G	C	T	R
SEQ ID NO: 43	W	V	A	C	S	W	D	H	G	C	R	S
SEQ ID NO: 44	H	V	I	C	S	V	N	G	G	C	R	G
SEQ ID NO: 45	W	V	X	C	K	P	L	H	G	C	Y	G

[365] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 37 to SEQ ID NO: 45.

[366] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 37 to SEQ ID NO: 45, or a truncated amino acid sequence of any one of SEQ ID NO: 37 to SEQ ID NO: 45, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[367] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 37 to SEQ ID NO: 45, or a truncated amino acid sequence of any one of SEQ ID NO: 37 to SEQ ID NO: 45, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[368] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (6a) (SEQ ID NO: 46), the amino acid sequence of Formula (6b) (SEQ ID NO: 47), the amino acid sequence of Formula (6c) (SEQ ID NO: 48), or the amino acid sequence of Formula (6d) (SEQ ID NO: 49):

$$–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}– \quad (6a)$$

$$–X^3–C–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–C–X^{13}— \quad (6b)$$

$$–X^2–X^3–C–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–C–X^{13}–X^{14}– \quad (6c)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}–X^{14}–X^{15}– \quad (6d)$$

wherein,

X^1 can be selected from an amino acid;

X^2 can be selected from an amino acid;

X^3 can be selected from an amino acid comprising a large hydrophobic side chain or an aromatic side chain;

X^4 can be C;

X^5 can be selected from an amino acid comprising a large hydrophobic side chain;

X^6 can be selected from an amino acid comprising a basic side chain;

X^7 can be selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain;

X^8 can be selected from an amino acid comprising an acidic side chain;

X^9 can be selected from an amino acid comprising a small hydrophobic side chain;

X^{10} can be selected from an amino acid;

X^{11} can be selected from an amino acid comprising a small hydrophobic side chain;

X^{12} can be C;

X^{13} can be selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^{14} can be selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain; and

X^{15} can be selected from an amino acid.

[369] In IL-2Rα ligands of Formula (6a)-(6d),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 can be selected from F, H, I, L, M, V, W, and Y;

X^4 can be C;

X^5 can be selected from F, I, L, M, V, W, and Y;

X^6 can be selected from H, K, and R;

X^7 can be selected from A, G, H, N, P, Q, S, T, and Y;

X^8 can be selected from D and E;

X^9 can be selected from A, G, P, S, and T;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be selected from A, G, P, S, and T;

X^{12} can be C;

X^{13} can be selected from F, H, I, L, M, V, W, and Y;

X^{14} can be selected from A, G, H, N, P, Q, S, T, and Y; and

X^{15} can be selected from any A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y

[370] In IL-2Rα ligands of Formula (6a)-(6d), X^1 can be selected from E, K, R, T, and L.

[371] In IL-2Rα ligands of Formula (6a)-(6d), X^2 can be selected from Q, Y, V, K, and R.

[372] In IL-2Rα ligands of Formula (6a)-(6d), X^3 can be selected from F, W, V, and L.

[373] In IL-2Rα ligands of Formula (6a)-(6d), X^4 can be C.

[374] In IL-2Rα ligands of Formula (6a)-(6d), X^5 can be L.

[375] In IL-2Rα ligands of Formula (6a)-(6d), X^6 can be selected from V, R, A, and K.

[376] In IL-2Rα ligands of Formula (6a)-(6d), X^7 can be S.

[377] In IL-2Rα ligands of Formula (6a)-(6d), X^8 can be selected from D and E.

[378] In IL-2Rα ligands of Formula (6a)-(6d), X^9 can be P.

[379] In IL-2Rα ligands of Formula (6a)-(6d), X^{10} can be selected from M, D, N, M Q, and T.

[380] In IL-2Rα ligands of Formula (6a)-(6d), X^{11} can be selected from A and S.

[381] In IL-2Rα ligands of Formula (6a)-(6d), X^{12} can be selected from C.

[382] In IL-2Rα ligands of Formula (6a)-(6d), X^{13} can be selected from F and W.

[383] In IL-2Rα ligands of Formula (6a)-(6d), X^{14} can be selected from S, A, and I.

[384] In IL-2Rα ligands of Formula (6a)-(6d), X^{15} can be selected from L, T, M, and V.

[385] In IL-2Rα ligands of Formula (6a)-(6d), X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[386] In IL-2Rα ligands of Formula (6a)-(6d), X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[387] In IL-2Rα ligands of Formula (6a)-(6d), X^3 can be selected from F, W, and Y.

[388] In IL-2Rα ligands of Formula (6a)-(6d), X^4 can be C.

[389] In IL-2Rα ligands of Formula (6a)-(6d), X^5 can be L.

[390] In IL-2Rα ligands of Formula (6a)-(6d), X^6 can be selected from H, K, and R.

[391] In IL-2Rα ligands of Formula (6a)-(6d), X^7 can be S.

[392] In IL-2Rα ligands of Formula (6a)-(6d), X^8 can be selected from D and E.

[393] In IL-2Rα ligands of Formula (6a)-(6d), X^9 can be P.

[394] In IL-2Rα ligands of Formula (6a)-(6d), X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[395] In IL-2Rα ligands of Formula (6a)-(6d), X^{11} can be A.

[396] In IL-2Rα ligands of Formula (6a)-(6d), X^{12} can be C.

[397] In IL-2Rα ligands of Formula (6a)-(6d), X^{13} can be selected from F, W, and Y.

[398] In IL-2Rα ligands of Formula (6a)-(6d), X^{13} can be W.

[399] In IL-2Rα ligands of Formula (6a)-(6d), X^{14} can be S.

[400] In IL-2Rα ligands of Formula (6a)-(6d), X^{15} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[401] In IL-2Rα ligands of Formula (6a)-(6d), X^4 can be C, X^5 can be L, X^7 can be S, X^8 can be E, X^9 can be P, X^{11} can be A, X^{12} can be C, X^{12} can be W, and X^{14} can be S.

[402] In IL-2Rα ligands of Formula (6a)-(6d),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 can be selected from F, H, I, L, M, V, W, and Y;

X^4 can be C;

X^5 can be L;

X^6 can be selected from H, K, and R;

X^7 can be S;

X^8 can be E;

X^9 can be P;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be A;

X^{12} can be C;

X^{13} can be W;

X^{14} can be S; and

X^{15} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[403] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 50 to SEQ ID NO: 54:

SEQ ID NO: 50	E	Q	F	C	L	V	S	D	P	M	A	C	W	S	L
SEQ ID NO: 51	K	Y	W	C	L	R	S	E	P	D	A	C	F	A	T
SEQ ID NO: 52	R	V	Y	C	L	A	S	E	P	N	S	C	W	S	T
SEQ ID NO: 53	T	K	L	C	L	K	S	E	P	Q	A	C	W	S	M
SEQ ID NO: 54	I	R	F	C	L	R	S	E	P	T	A	C	W	I	V

[404] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 46 to SEQ ID NO: 54.

[405] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 46 to SEQ ID NO: 54, or a truncated amino acid sequence of any one of SEQ ID NO: 46 to SEQ ID NO: 54, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[406] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 46 to SEQ ID NO: 54, or a truncated amino acid sequence of any one of SEQ ID NO: 46 to SEQ ID NO: 54, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[407] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (7a) (SEQ ID NO: 55), the amino acid sequence of Formula (7b) (SEQ ID NO: 56), the amino acid sequence of Formula (7c) (SEQ ID NO: 57), or the amino acid sequence of Formula (7d) (SEQ ID NO: 58):

$$–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}— \quad (7a)$$

$$–X^3–C–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–C–X^{13}– \quad (7b)$$

$$–X^2–X^3–C–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–C–X^{13}–X^{14}– \quad (7c)$$

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-X^{14}-X^{15}- \quad (7d)$$

wherein,

X^1 can be selected from a basic amino acid;

X^2 can be selected from a basic amino acid;

X^3 can be selected from an amino acid comprising a large hydrophobic side chain;

X^4 can be C;

X^5 can be selected from an amino acid comprising a large hydrophobic side chain;

X^6 can be selected from an amino acid comprising a basic side chain;

X^7 can be selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain;

X^8 can be selected from an amino acid comprising a large hydrophobic side chain;

X^9 can be selected from an amino acid comprising a small hydrophobic side chain;

X^{10} can be selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain;

X^{11} can be selected from an amino acid comprising a small hydrophobic side chain;

X^{12} can be C;

X^{13} can be selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^{14} can be selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain; and

X^{15} can be selected from an amino acid comprising a large hydrophobic side chain.

[408] In IL-2Rα ligands of Formula (7a)-(7d),

X^1 can be selected from K, and R;

X^2 can be selected from H, K, and R;

X^3 can be selected from F, I, L, M, V, W, and Y;

X^4 can be C;

X^5 can be selected from F, I, L, M, V, W, and Y;

X^6 can be selected from H, K, and R;

X^7 can be selected from A, G, H, N, P, Q, S, T, and Y;

X^8 can be selected from F, I, L, M, V, W, and Y;

X^9 can be selected from A, G, P, S, and T;

X^{10} can be selected from A, G, H, N, P, Q, S, T, and Y;

X^{11} can be selected from A, G, P, S, and T;

X^{12} can be C;

X^{13} can be selected from F, H, I, L, M, V, W, and Y;

X^{14} can be selected from A, G, H, N, P, Q, S, T, and Y; and

X^{15} can be selected from F, I, L, M, V, W, and Y.

[409] In IL-2Rα ligands of Formula (7a)-(7d), X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[410] In IL-2Rα ligands of Formula (7a)-(7d), X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[411] In IL-2Rα ligands of Formula (7a)-(7d), X^3 can be selected from F, I, L, M, V, W, and Y.

[412] In IL-2Rα ligands of Formula (7a)-(7d), X^4 can be C.

[413] In IL-2Rα ligands of Formula (7a)-(7d), X^5 can be selected from F, I, L, M, V, W, and Y.

[414] In IL-2Rα ligands of Formula (7a)-(7d), X^5 can be L.

[415] In IL-2Rα ligands of Formula (7a)-(7d), X^6 can be selected from H, K, and R.

[416] In IL-2Rα ligands of Formula (7a)-(7d), X^7 can be selected from A, G, P, S, and T.

[417] In IL-2Rα ligands of Formula (7a)-(7d), X^7 can be selected from H, N, Q, S, T, and Y.

[418] In IL-2Rα ligands of Formula (7a)-(7d), X^7 can be S.

[419] In IL-2Rα ligands of Formula (7a)-(7d), X^8 can be selected from D and E.

[420] In IL-2Rα ligands of Formula (7a)-(7d), X^9 can be P.

[421] In IL-2Rα ligands of Formula (7a)-(7d), X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[422] In IL-2Rα ligands of Formula (7a)-(7d), X^{11} can be A.

[423] In IL-2Rα ligands of Formula (7a)-(7d), X^{12} can be C.

[424] In IL-2Rα ligands of Formula (7a)-(7d), X^{13} can be W.

[425] In IL-2Rα ligands of Formula (7a)-(7d), X^{14} can be S.

[426] In IL-2Rα ligands of Formula (7a)-(7d), X^{15} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[427] In IL-2Rα ligands of Formula (7a)-(7d), X^1 can be R.

[428] In IL-2Rα ligands of Formula (7a)-(7d), X^2 can be R.

[429] In IL-2Rα ligands of Formula (7a)-(7d), X^3 can be F.

[430] In IL-2Rα ligands of Formula (7a)-(7d), X^4 can be C.

[431] In IL-2Rα ligands of Formula (7a)-(7d), X^5 can be L.

[432] In IL-2Rα ligands of Formula (7a)-(7d), X^6 can be R.

[433] In IL-2Rα ligands of Formula (7a)-(7d), X^7 can be S.

[434] In IL-2Rα ligands of Formula (7a)-(7d), X^8 can be E.

[435] In IL-2Rα ligands of Formula (7a)-(7d), X^9 can be P.

[436] In IL-2Rα ligands of Formula (7a)-(7d), X^{10} can be T.

[437] In IL-2Rα ligands of Formula (7a)-(7d), X^{11} can be A.

[438] In IL-2Rα ligands of Formula (7a)-(7d), X^{12} can be C.

[439] In IL-2Rα ligands of Formula (7a)-(7d), X^{13} can be W.

[440] In IL-2Rα ligands of Formula (7a)-(7d), X^{14} can be T.

[441] In IL-2Rα ligands of Formula (7a)-(7d), X^{15} can be V.

[442] In IL-2Rα ligands of Formula (7a)-(7d), X^1 can be R, X^2 can be R, X^3 can be F, X^4 can be C, X^5 can be L, X^6, can be R, X^7 can be S, X^8 can be E, X^9 can be P, X^{10} can be T, X^{11} can be A, X^{12} can be C, X^{13} can be W, and X^{15} can be V.

[443] In IL-2Rα ligands of Formula (7a)-(7d),

X^1 can be selected from K and R;

X^2 can be R;

X^3 can be F;

X^4 can be C;

X^5 can be L;

X^6 can be R;

X^7 can be S;

X^8 can be E;

X^9 can be P;

X^{10} can be T;

X^{11} can be A;

X^{12} can be C;

X^{13} can be W;

X^{14} can be T; and

X^{15} can be V.

[444] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 59 to SEQ ID NO: 68:

SEQ ID NO: 59	R	R	F	C	L	R	S	E	P	T	A	C	W	I	V
SEQ ID NO: 60	K	L	F	C	L	R	S	G	D	R	A	C	W	V	V
SEQ ID NO: 61	M	R	F	C	L	R	S	E	P	T	A	C	W	T	V
SEQ ID NO: 62	R	R	F	C	L	R	S	E	P	T	A	C	W	D	V
SEQ ID NO: 63	R	R	F	C	L	R	S	D	P	T	A	C	W	I	V
SEQ ID NO: 64	K	R	F	C	L	R	S	E	P	T	A	C	W	T	V
SEQ ID NO: 65	R	R	F	C	L	R	S	E	P	M	A	C	W	T	V
SEQ ID NO: 66	R	R	F	C	L	R	S	E	P	T	A	C	W	T	V
SEQ ID NO: 67	R	R	F	C	L	R	S	E	P	A	A	C	W	F	V
SEQ ID NO: 68	R	R	F	C	L	R	S	E	P	T	A	C	W	Y	V

[445] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 55 to SEQ ID NO: 68.

[446] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 55 to SEQ ID NO: 68, or a truncated amino acid sequence of any one of SEQ ID NO: 55 to SEQ ID NO: 68, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[447] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 55 to SEQ ID NO: 68, or a truncated amino acid sequence of any one of SEQ ID NO: 55 to SEQ ID NO: 68, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[448] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (8a) (SEQ ID NO: 69) the amino acid sequence of Formula (8b) (SEQ ID NO: 70), or the amino acid sequence of Formula (8c) (SEQ ID NO: 71):

$$–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}– \quad (8a)$$

$$–X^2–C–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–C–X^{13}– \quad (8b)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}–X^{14}– \quad (8c)$$

wherein,

X^1 can be selected from an amino acid;

X^2 can be selected from an amino acid comprising a basic side chain;

X^3 can be C;

X^4 can be selected from an amino acid comprising a large hydrophobic side chain or a basic side chain;

X^5 can be selected from an amino acid;

X^6 can be selected from an amino acid comprising an acidic side chain;

X^7 can be selected from an amino acid;

X^8 can be selected from an amino acid;

X^9 can be selected from an amino acid;

X^{10} can be selected from an amino acid comprising a small hydrophobic side chain;

X^{11} can be selected from an amino acid;

X^{12} can be C;

X^{13} can be selected from an amino acid comprising a large hydrophobic side chain; and

X^{14} can be selected from an amino acid comprising a large hydrophobic side chain.

[449] In IL-2Rα ligands of Formula (8a)-(8c),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from H, K, and R;

X^3 can be C;

X^4 can be selected from F, H, I, K, L, M, R, V, W, and Y;

X^5 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^6 can be selected from D and E;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} can be selected from A, G, P, S, and T;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be C;

X^{13} can be selected from F, I, L, M, V, W, and Y; and

X^{14} can be selected from F, I, L, M, V, W, and Y.

[450] In IL-2Rα ligands of Formula (8a)-(8c), X^1 can be selected from R, I, L, M, N, S. T, V, and D.

[451] In IL-2Rα ligands of Formula (8a)-(8c), X^2 can be selected from S, K, R, H, G, and F.

[452] In IL-2Rα ligands of Formula (8a)-(8c), X^3 can be C.

[453] In IL-2Rα ligands of Formula (8a)-(8c), X^4 can be selected from N, R , I, T, V, L, and D.

[454] In IL-2Rα ligands of Formula (8a)-(8c), X^5 can be selected from R, V, L, M, V, G, Y, I, F, and T.

[455] In IL-2Rα ligands of Formula (8a)-(8c), X^5 can be selected from Y, L, E, D, S, I, Y, D, and R.

[456] In IL-2Rα ligands of Formula (8a)-(8c), X^6 can be selected from Y, L, E, D, S, and R.

[457] In IL-2Rα ligands of Formula (8a)-(8c), X^7 can be selected from G, E, K, T, P, W, L, Y, G, S, and R.

[458] In IL-2Rα ligands of Formula (8a)-(8c), X^8 can be selected from I, A, Q, R, S R, L, N, P, A, I, R, D, and W.

[459] In IL-2Rα ligands of Formula (8a)-(8c), X^9 can be selected from W, G, S, D, R, L, F, P, A, and T.

[460] In IL-2Rα ligands of Formula (8a)-(8c), X^{10} can be selected from G, T, E, W, Q, R, and Y.

[461] In IL-2Rα ligands of Formula (8a)-(8c), X^{11} can be selected from H, P, I, T, H, A, S, F, and Y.

[462] In IL-2Rα ligands of Formula (8a)-(8c), X^{12} can be C.

[463] In IL-2Rα ligands of Formula (8a)-(8c), X^{13} can be selected from D, V, L, I, Y, I, R, H, T, I, and W.

[464] In IL-2Rα ligands of Formula (8a)-(8c), X^{14} can be selected from T, S, F, and I.

[465] In IL-2Rα ligands of Formula (8a)-(8c), X^1 can be selected from R, I, L, M, N, S. T, V, and D.

[466] In IL-2Rα ligands of Formula (8a)-(8c), X^2 can be selected from S, K, R, H, G, and F.

[467] In IL-2Rα ligands of Formula (8a)-(8c), X^3 can be C.

[468] In IL-2Rα ligands of Formula (8a)-(8c), X^4 can be selected from F, I, L, M, V, W, and Y.

[469] In IL-2Rα ligands of Formula (8a)-(8c), X^4 can be selected from H, K, and R.

[470] In IL-2Rα ligands of Formula (8a)-(8c), X^5 can be selected from Y, L, E, D, S, I, Y, D, and R.

[471] In IL-2Rα ligands of Formula (8a)-(8c), X^6 can be selected from Y, L, E, D, S, and R.

[472] In IL-2Rα ligands of Formula (8a)-(8c), X^6 can be selected from D and E.

[473] In IL-2Rα ligands of Formula (8a)-(8c), X^7 can be selected from G, E, K, T, P, W, L, Y, G, S, and R.

[474] In IL-2Rα ligands of Formula (8a)-(8c), X^8 can be selected from I, A, Q, R, S R, L, N, P, A, I, R, D, and W.

[475] In IL-2Rα ligands of Formula (8a)-(8c), X^9 can be selected from W, G, S, D, R, L, F, P, A, and T.

[476] In IL-2Rα ligands of Formula (8a)-(8c), X^{10} can be selected from G, T, E, W, Q, R, and Y.

[477] In IL-2Rα ligands of Formula (8a)-(8c), X^{10} can be G.

[478] In IL-2Rα ligands of Formula (8a)-(8c), X^{11} can be selected from H, P, I, T, H, A, S, F, and Y.

[479] In IL-2Rα ligands of Formula (8a)-(8c), X^{12} can be C.

[480] In IL-2Rα ligands of Formula (8a)-(8c), X^{13} can be selected from F, I, L, M, V, W, and Y.

[481] In IL-2Rα ligands of Formula (8a)-(8c), X^{14} can be F.

[482] In IL-2Rα ligands of Formula (8a)-(8c), X^2 can be R, X^3 can be C, X^6, can be D, X^{10} can be G, X^{12} can be C, and X^{14} can be F.

[483] In IL-2Rα ligands of Formula (8a)-(8c),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be R;

X^3 can be C;

X^4 can be selected from F, H, I, K, L, M, R, V, W, and Y;

X^5 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^6 can be D;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} can be G;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be C;

X^{13} can be selected from F, I, L, M, V, W, and Y; and

X^{14} can be F.

[484] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 72 to SEQ ID NO: 86:

SEQ ID NO: 72	R	S	C	N	R	Y	G	I	W	G	H	C	D	T
SEQ ID NO: 73	I	K	C	R	V	L	E	A	G	T	P	C	V	F
SEQ ID NO: 74	I	R	C	R	Y	E	K	Q	S	G	I	C	L	F
SEQ ID NO: 75	L	R	C	R	L	D	T	R	D	G	T	C	R	F
SEQ ID NO: 76	M	R	C	I	L	S	P	S	R	E	H	C	L	F

SEQ ID NO: 77	N	H	C	T	M	D	W	R	L	G	A	C	I	F
SEQ ID NO: 78	S	G	C	R	L	S	L	L	D	G	H	C	Y	F
SEQ ID NO: 79	S	K	C	V	Y	D	Y	N	F	G	T	C	I	F
SEQ ID NO: 80	S	R	C	V	M	S	L	Q	L	G	A	C	I	F
SEQ ID NO: 81	T	R	C	T	V	I	G	P	P	W	S	C	R	F
SEQ ID NO: 82	V	F	C	I	G	Y	G	A	A	Q	S	C	H	S
SEQ ID NO: 83	V	R	C	L	Y	D	S	I	T	R	T	C	T	F
SEQ ID NO: 84	V	S	C	K	I	D	R	R	S	G	S	C	L	F
SEQ ID NO: 85	V	S	C	R	F	R	P	D	L	G	F	C	I	F
SEQ ID NO: 86	D	R	C	D	T	R	T	W	G	Y	Y	C	W	I

[485] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 69 to SEQ ID NO: 86.

[486] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 69 to SEQ ID NO: 86, or a truncated amino acid sequence of any one of SEQ ID NO: 69 to SEQ ID NO: 86, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[487] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 69 to SEQ ID NO: 86, or a truncated amino acid sequence of any one of SEQ ID NO: 69 to SEQ ID NO: 86, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[488] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (9a) (SEQ ID NO: 87), the amino acid sequence of Formula (9b) (SEQ ID NO: 88), the amino acid sequence of Formula (9c) (SEQ ID NO: 89), or the amino acid sequence of Formula (9d) (SEQ ID NO: 90):

$$–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}– \quad (9a)$$

$$–X^3–C–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–C–X^{14}– \quad (9b)$$

$$–X^2–X^3–C–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–C–X^{14}– X^{15}– \quad (9c)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}–X^{14}– X^{15}–X^{16}– \quad (9d)$$

wherein,

X^1 can be selected from an amino acid;

X^2 can be selected from an amino acid comprising a large hydrophobic side chain;

X^3 can be selected from an amino acid comprising a large hydrophobic side chain or an acidic side chain;

X^4 can be C;

X^5 can be selected from an amino acid comprising a large hydrophobic side chain or a basic side chain;

X^6 can be selected from an amino acid comprising a large hydrophobic side chain;

X^7 can be selected from an amino acid;

X^8 can be selected from an amino acid comprising a small hydrophobic side chain;

X^9 can be selected from an amino acid comprising a small hydrophobic side chain;

X^{10} can be selected from an amino acid comprising a large hydrophobic side chain or a basic side chain;

X^{11} can be selected from an amino acid comprising a basic side chain or an acidic side chain;

X^{12} can be selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain;

X^{13} can be C;

X^{14} can be selected from an amino acid;

X^{15} can be selected from an amino acid; and

X^{16} can be selected from an amino acid.

[489] In IL-2Rα ligands of Formula (9a)-(9d),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from F, I, L, M, V, W, and Y;

X^3 can be selected from D, E, F, I, L, M, V, W, and Y;

X^4 can be C;

X^5 can be selected from F, H, I, K, L, M, R, V, W, and Y;

X^6 can be selected from F, I, L, M, V, W, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be selected from A, G, P, S, and T;

X^9 can be selected from A, G, P, S, and T;

X^{10} can be selected from F, H, I, K, L, M, R, V, W, and Y;

X^{11} can be selected from D, E, H, K, and R;

X^{12} can be selected from A, G, H, N, P, Q, S, T, and Y;

X^{13} can be C;

X^{14} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{15} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y; and

X^{16} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[490] In IL-2Rα ligands of Formula (9a)-(9d), X^1 can be selected from G, E, F, K, P, Q, R, S, and V.

[491] In IL-2Rα ligands of Formula (9a)-(9d), X^2 can be selected from S, W, I, F, L, and R.

[492] In IL-2Rα ligands of Formula (9a)-(9d), X^3 can be selected from R, E, I, V, S, N, F, L, and M.

[493] In IL-2Rα ligands of Formula (9a)-(9d), X^4 can be C.

[494] In IL-2Rα ligands of Formula (9a)-(9d), X^5 can be selected from Y, R, V, T, E, I, and K.

[495] In IL-2Rα ligands of Formula (9a)-(9d), X^6 can be selected from W, F, Y, L, H, I, T, S, and V.

[496] In IL-2Rα ligands of Formula (9a)-(9d), X^7 can be selected from D, L, S, D, V, Y, S, Q, I, R, M, G, and A.

[497] In IL-2Rα ligands of Formula (9a)-(9d), X^8 can be P.

[498] In IL-2Rα ligands of Formula (9a)-(9d), X^9 can be G.

[499] In IL-2Rα ligands of Formula (9a)-(9d), X^{10} can be selected from R, S, T, N, R, V, L, H, W, and Y.

[500] In IL-2Rα ligands of Formula (9a)-(9d), X^{11} can be selected from E, R, H, G, E, K, Q, and V.

[501] In IL-2Rα ligands of Formula (9a)-(9d), X^{12} can be selected from V, G, S, A, and W.

[502] In IL-2Rα ligands of Formula (9a)-(9d), X^{13} can be C.

[503] In IL-2Rα ligands of Formula (9a)-(9d), X^{14} can be selected from I, S, R, W, H, V, K, T, R, G, and P.

[504] In IL-2Rα ligands of Formula (9a)-(9d), X^{13} can be selected from F, L, M, S, W, T, A, and R.

[505] In IL-2Rα ligands of Formula (9a)-(9d), X^{14} can be selected from K, F, V, I, F, M, L, Q, T, and N.

[506] In IL-2Rα ligands of Formula (9a)-(9d), X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[507] In IL-2Rα ligands of Formula (9a)-(9d), X^2 can be selected from F, W, and Y.

[508] In IL-2Rα ligands of Formula (9a)-(9d), X^3 can be W.

[509] In IL-2Rα ligands of Formula (9a)-(9d), X^4 can be C.

[510] In IL-2Rα ligands of Formula (9a)-(9d), X^5 can be selected from F, I, L, M, V, W, and Y.

[511] In IL-2Rα ligands of Formula (9a)-(9d), X^5 can be selected from D and E.

[512] In IL-2Rα ligands of Formula (9a)-(9d), X^6 can be selected from F, I, L, M, V, W, and Y.

[513] In IL-2Rα ligands of Formula (9a)-(9d), X^6 can be selected from F, W, and Y.

[514] In IL-2Rα ligands of Formula (9a)-(9d), X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[515] In IL-2Rα ligands of Formula (9a)-(9d), X^8 can be P.

[516] In IL-2Rα ligands of Formula (9a)-(9d), X^9 can be G.

[517] In IL-2Rα ligands of Formula (9a)-(9d), X^{10} can be selected from F, I, L, M, V, W, and Y.

[518] In IL-2Rα ligands of Formula (9a)-(9d), X^{10} can be selected from F, W, and Y.

[519] In IL-2Rα ligands of Formula (9a)-(9d), X^{10} can be selected from H, K, and R.

[520] In IL-2Rα ligands of Formula (9a)-(9d), X^{11} can be selected from H, K, and R.

[521] In IL-2Rα ligands of Formula (9a)-(9d), X^{11} can be selected from D and E.

[522] In IL-2Rα ligands of Formula (9a)-(9d), X^{12} can be selected from A, G, P, S, and T.

[523] In IL-2Rα ligands of Formula (9a)-(9d), X^{12} can be selected from N, Q, S, T, and Y.

[524] In IL-2Rα ligands of Formula (9a)-(9d), X^{13} can be C.

[525] In IL-2Rα ligands of Formula (9a)-(9d), X^{14} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[526] In IL-2Rα ligands of Formula (9a)-(9d), X^{15} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[527] In IL-2Rα ligands of Formula (9a)-(9d), X^{16} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[528] In IL-2Rα ligands of Formula (9a)-(9d), X^{16} can be selected from F, I, L, M, V, W, and Y.

[529] In IL-2Rα ligands of Formula (9a)-(9d), X^{16} can be selected from F, W, and Y.

[530] In IL-2Rα ligands of Formula (9a)-(9d), X^2 can be W, X^3 can be E, X^4 can be C, X^5, can be R, X^8 can be P, X^9 can be G, X^{10} can be R, X^{11} can be R, X^{12} can be G, and X^{13} can be C.

[531] In IL-2Rα ligands of Formula (9a)-(9d),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be W;

X^3 can be E;

X^4 can be C;

X^5 can be R;

X^6 can be selected from F, H, I, L, M, V, W, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be P;

X^9 can be G

X^{10} can be R;

X^{11} can be R;

X^{12} can be G;

X^{13} can be C;

X^{14} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{15} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y; and

X^{16} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[532] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 91 to SEQ ID NO: 104:

SEQ ID NO: 91	G	S	R	C	Y	W	D	P	G	R	E	V	C	I	F	K
SEQ ID NO: 92	E	W	E	C	R	F	L	P	G	R	R	G	C	S	L	F
SEQ ID NO: 93	F	W	E	C	V	Y	S	P	G	S	R	G	C	R	M	V
SEQ ID NO: 94	G	F	R	C	T	Y	D	P	G	T	H	S	C	W	S	I
SEQ ID NO: 95	K	W	I	C	R	L	V	P	G	N	G	A	C	H	S	F
SEQ ID NO: 96	P	W	V	C	E	H	Y	P	G	R	R	G	C	V	L	M
SEQ ID NO: 97	Q	W	S	C	V	F	S	P	G	V	R	G	C	K	L	V
SEQ ID NO: 98	R	F	I	C	R	I	Q	P	G	R	E	G	C	W	S	L
SEQ ID NO: 99	R	W	E	C	I	Y	I	P	G	R	K	G	C	T	L	Q

SEQ ID NO: 100	S	L	N	C	K	T	R	P	G	L	R	W	C	T	W	T
SEQ ID NO: 101	S	W	E	C	V	Y	M	P	G	H	Q	G	C	R	L	F
SEQ ID NO: 102	V	R	F	C	R	S	G	P	G	W	V	S	C	G	T	Q
SEQ ID NO: 103	V	R	L	C	R	V	G	P	G	Y	E	S	C	P	A	N
SEQ ID NO: 104	V	R	M	C	Y	V	A	P	G	Y	V	S	C	P	R	M

[533] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 87 to SEQ ID NO: 104.

[534] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 87 to SEQ ID NO: 104, or a truncated amino acid sequence of any one of SEQ ID NO: 87 to SEQ ID NO: 104, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[535] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 87 to SEQ ID NO: 104, or a truncated amino acid sequence of any one of SEQ ID NO: 87 to SEQ ID NO: 104, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[536] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (10a) (SEQ ID NO: 105), the amino acid sequence of Formula (10b) (SEQ ID NO: 106), the amino acid sequence of Formula (10c) (SEQ ID NO: 107), or the amino acid sequence of Formula (10d) (SEQ ID NO: 108):

$$-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (10a)$$

$$-X^3-C-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}- \quad (10b)$$

$$-X^2-X^3-C-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}-X^{15}- \quad (10c)$$

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-X^{14}-X^{15}-X^{16}- \quad (10d)$$

wherein,

X^1 can be selected from an amino acid comprising an acidic side chain;

X^2 can be selected from an amino acid comprising a large hydrophobic side chain;

X^3 can be selected from an amino acid comprising an acidic side chain;

X^4 can be C;

X^5 can be selected from an amino acid comprising a large hydrophobic side chain;

X^6 can be selected from an amino acid comprising a large hydrophobic side chain;

X^7 can be selected from an amino acid comprising a large hydrophobic side chain;

X^8 can be selected from an amino acid comprising a small hydrophobic side chain;

X^9 can be selected from an amino acid comprising a small hydrophobic side chain;

X^{10} can be selected from an amino acid comprising a basic side chain;

X^{11} can be selected from an amino acid comprising a basic side chain;

X^{12} can be selected from an amino acid comprising a small hydrophobic side chain;

X^{13} can be C;

X^{14} can be selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain;

X^{14} can be selected from an amino acid comprising a large hydrophobic side chain; and

X^{15} can be selected from an amino acid comprising a large hydrophobic side chain.

[537] In IL-2Rα ligands of Formula (10a)-(10d),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from F, I, L, M, V, W, and Y;

X^3 can be selected from D and E;

X^4 can be C;

X^5 can be selected from F, I, L, M, V, W, and Y;

X^6 can be selected from F, I, L, M, V, W, and Y;

X^7 can be selected from F, I, L, M, V, W, and Y;

X^8 can be selected from A, G, P, S, and T;

X^9 can be selected from A, G, P, S, and T;

X^{10} can be selected from H, K, and R;

X^{11} can be selected from H, K, and R;

X^{12} can be selected from A, G, P, S, and T;

X^{13} can be C;

X^{14} can be selected from A, G, H, N, P, Q, S, T, and Y;

X^{15} can be selected from F, I, L, M, V, W, and Y; and

X^{16} can be selected from F, I, L, M, V, W, and Y.

[538] In IL-2Rα ligands of Formula (10a)-(10d), X^1 can be selected from N, D, E, A, V, and T.

[539] In IL-2Rα ligands of Formula (10a)-(10d), X^2 can be selected from W and Y.

[540] In IL-2Rα ligands of Formula (10a)-(10d), X^3 can be selected from E, H, and D.

[541] In IL-2Rα ligands of Formula (10a)-(10d), X^4 can be C.

[542] In IL-2Rα ligands of Formula (10a)-(10d), X^5 can be selected from I, l, W, and V.

[543] In IL-2Rα ligands of Formula (10a)-(10d), X^6 can be selected from F and I.

[544] In IL-2Rα ligands of Formula (10a)-(10d), X^7 can be selected from S, L, and M.

[545] In IL-2Rα ligands of Formula (10a)-(10d), X^8 can be P.

[546] In IL-2Rα ligands of Formula (10a)-(10d), X^9 can be G.

[547] In IL-2Rα ligands of Formula (10a)-(10d), X^{10} can be selected from R and H.

[548] In IL-2Rα ligands of Formula (10a)-(10d), X^{11} can be selected from R and K.

[549] In IL-2Rα ligands of Formula (10a)-(10d), X^{12} can be G.

[550] In IL-2Rα ligands of Formula (10a)-(10d), X^{13} can be C.

[551] In IL-2Rα ligands of Formula (10a)-(10d), X^{14} can be selected from S, L, T, and F.

[552] In IL-2Rα ligands of Formula (10a)-(10d), X^{13} can be selected from L and G.

[553] In IL-2Rα ligands of Formula (10a)-(10d), X^{14} can be selected from F, M, T, and I.

[554] In IL-2Rα ligands of Formula (10a)-(10d), X^{1} can be selected from D and E.

[555] In IL-2Rα ligands of Formula (10a)-(10d), X^{2} can be W.

[556] In IL-2Rα ligands of Formula (10a)-(10d), X^{3} can be selected from D and E.

[557] In IL-2Rα ligands of Formula (10a)-(10d), X^{4} can be C.

[558] In IL-2Rα ligands of Formula (10a)-(10d), X^{5} can be selected from F, I, L, M, V, W, and Y.

[559] In IL-2Rα ligands of Formula (10a)-(10d), X^{5} can be selected from I and L.

[560] In IL-2Rα ligands of Formula (10a)-(10d), X^{6} can be F.

[561] In IL-2Rα ligands of Formula (10a)-(10d), X^{7} can be selected from L and M.

[562] In IL-2Rα ligands of Formula (10a)-(10d), X^{8} can be P.

[563] In IL-2Rα ligands of Formula (10a)-(10d), X^{9} can be G.

[564] In IL-2Rα ligands of Formula (10a)-(10d), X^{10} can be selected from H and R.

[565] In IL-2Rα ligands of Formula (10a)-(10d), X^{11} can be selected from K and R.

[566] In IL-2Rα ligands of Formula (10a)-(10d), X^{12} can be G.

[567] In IL-2Rα ligands of Formula (10a)-(10d), X^{13} can be C.

[568] In IL-2Rα ligands of Formula (10a)-(10d), X^{14} can be selected from S and T.

[569] In IL-2Rα ligands of Formula (10a)-(10d), X^{15} can be L.

[570] In IL-2Rα ligands of Formula (10a)-(10d), X^{16} can be selected from F and M.

[571] In IL-2Rα ligands of Formula (10a)-(10d),

X^{1} can be D;

X^{2} can be W;

X^{3} can be E;

X^{4} can be C;

X^{5} can be L;

X^{6} can be F;

X^{7} can be L;

X^{8} can be P;

X^{9} can be G;

X^{10} can be selected from H and R;

X^{11} can be selected from K and R;

X^{12} can be G;

X^{13} can be C;

X^{14} can be T;

X^{15} can be L; and

X^{16} can be F.

[572] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 109 to SEQ ID NO: 121:

SEQ ID NO: 109	N	W	E	C	I	F	S	P	G	R	R	G	C	S	L	T
SEQ ID NO: 110	D	W	E	C	L	F	L	P	G	R	R	G	C	L	L	F
SEQ ID NO: 111	E	W	E	C	L	F	M	P	G	R	R	G	C	L	L	M
SEQ ID NO: 112	A	W	E	C	L	F	L	P	G	H	R	G	C	S	L	F
SEQ ID NO: 113	E	W	E	C	L	F	L	P	G	R	K	G	C	T	L	F
SEQ ID NO: 114	D	W	E	C	I	F	L	P	G	R	R	G	C	T	L	F
SEQ ID NO: 115	V	Y	E	C	L	F	M	P	G	R	K	G	C	F	G	M
SEQ ID NO: 116	E	W	E	C	W	F	L	P	G	R	R	G	C	T	L	I
SEQ ID NO: 117	D	W	H	C	L	F	L	P	G	H	R	G	C	T	L	F
SEQ ID NO: 118	D	W	E	C	L	F	L	P	G	R	R	G	C	T	L	F
SEQ ID NO: 119	Y	W	E	C	V	F	M	P	G	H	R	G	C	S	L	I
SEQ ID NO: 120	T	W	D	C	L	F	L	P	G	R	R	G	C	T	L	M
SEQ ID NO: 121	N	W	E	C	I	F	S	P	G	R	R	G	C	S	L	T

[573] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 105 to SEQ ID NO: 121.

[574] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 105 to SEQ ID NO: 121, or a truncated amino acid sequence of any one of SEQ ID NO: 105 to SEQ ID NO: 121, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[575] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 105 to SEQ ID NO: 121, or a truncated amino acid sequence of any one of SEQ ID NO: 105 to SEQ ID NO: 121, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[576] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (11a) (SEQ ID NO: 122), the amino acid sequence of Formula (11b) (SEQ ID NO: 123), the amino acid sequence of Formula (11c) (SEQ ID NO: 124), or the amino acid sequence of Formula (11d) (SEQ ID NO: 125):

$$-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}— \quad (11a)$$

$$-X^3-C-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}- \quad (11b)$$

$$-X^2-X^3-C-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}-X^{15}- \quad (11c)$$

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-X^{14}- X^{15}-X^{16}- \quad (11d)$$

wherein,

X^1 can be selected from an amino acid;

X^2 can be selected from an amino acid;

X^3 can be selected from an amino acid;

X^4 can be C;

X^5 can be selected from an amino acid comprising an acidic side chain;

X^6 can be selected from an amino acid

X^7 can be selected from an amino acid comprising an acidic side chain or an aromatic side chain;

X^8 can be selected from an amino acid comprising a small hydrophobic side chain;

X^9 can be selected from an amino acid comprising a small hydrophobic side chain;

X^{10} can be selected from an amino acid comprising an aromatic chain;

X^{11} can be selected from an amino acid;

X^{12} can be selected from an amino acid;

X^{13} can be C;

X^{14} can be selected from an amino acid;

X^{15} can be selected from an amino acid comprising a large hydrophobic side chain; and

X^{16} can be selected from an amino acid comprising a large hydrophobic side chain.

[577] In IL-2Rα ligands of Formula (11a)-(11d),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^4 can be C;

X^5 can be selected from D and E;

X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 can be selected from D, E, F, H, W, and Y;

X^8 can be selected from A, G, P, S, and T;

X^9 can be selected from A, G, P, S, and T;

X^{10} can be selected from F, H, W, and Y;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} can be C;

X^{14} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{15} can be selected from F, I, L, M, V, W, and Y; and

X^{16} can be selected from F, I, L, M, V, W, and Y.

[578] In IL-2Rα ligands of Formula (11a)-(11d), X^1 can be selected from A, E, F, G, K, R, T, Y, and W.

[579] In IL-2Rα ligands of Formula (11a)-(11d), X^2 can be selected from G, T, K, Q, S, L, Q, R, and A.

[580] In IL-2Rα ligands of Formula (11a)-(11d), X^3 can be selected from F, Y, W, and H.

[581] In IL-2Rα ligands of Formula (11a)-(11d), X^3 can be selected from G, W, P, L, R, F, M, V, S, and P.

[582] In IL-2Rα ligands of Formula (11a)-(11d), X^4 can be C.

[583] In IL-2Rα ligands of Formula (11a)-(11d), X^5 can be selected from K, D, Y, T, Y, Q, F, L, and S.

[584] In IL-2Rα ligands of Formula (11a)-(11d), X^6 can be selected from L, D, F, Y, W, N, D, M, V, D, L, and Y.

[585] In IL-2Rα ligands of Formula (11a)-(11d), X^7 can be selected from N, H, F, D, N, S, L, and Y.

[586] In IL-2Rα ligands of Formula (11a)-(11d), X^8 can be P.

[587] In IL-2Rα ligands of Formula (11a)-(11d), X^9 can be G.

[588] In IL-2Rα ligands of Formula (11a)-(11d), X^{10} can be selected from T, H, L, S, Q, R, N, Y, W, V, S, and H.

[589] In IL-2Rα ligands of Formula (11a)-(11d), X^{11} can be selected from Q, W, P, D, E, S, P, E, H, G, R, and G.

[590] In IL-2Rα ligands of Formula (11a)-(11d), X^{12} can be selected from V, S, R, I, A, D, S, E, Y, and G.

[591] In IL-2Rα ligands of Formula (11a)-(11d), X^{13} can be C.

[592] In IL-2Rα ligands of Formula (11a)-(11d), X^{14} can be selected from S, E, T, V, I, D, Q, W, P, I, and Y.

[593] In IL-2Rα ligands of Formula (11a)-(11d), X^{15} can be selected from F, M, W, I, V, T, N, L, and S.

[594] In IL-2Rα ligands of Formula (11a)-(11d), X^{16} can be selected from Y, V, I, L, S, K, E, and R.

[595] In IL-2Rα ligands of Formula (11a)-(11d), X^4 can be C.

[596] In IL-2Rα ligands of Formula (11a)-(11d), X^5 can be D.

[597] In IL-2Rα ligands of Formula (11a)-(11d), X^7 can be selected from D and H.

[598] In IL-2Rα ligands of Formula (11a)-(11d), X^8 can be P.

[599] In IL-2Rα ligands of Formula (11a)-(11d), X^9 can be G.

[600] In IL-2Rα ligands of Formula (11a)-(11d), X^{10} can be selected from F, H, W, and Y.

[601] In IL-2Rα ligands of Formula (11a)-(11d), X^{13} can be C.

[602] In IL-2Rα ligands of Formula (11a)-(11d), X^{15} can be selected from F, M, I, W, V, and L.

[603] In IL-2Rα ligands of Formula (11a)-(11d), X^{16} can be selected from Y, V, I, and L.

[604] In IL-2Rα ligands of Formula (11a)-(11d),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^4 can be C;

X^5 can be selected from D and E;

X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 can be selected from D, E, H, F, W, and Y;

X^8 can be P;

X^9 can be G;

X^{10} can be selected from H, F, W, and Y;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} can be C;

X^{14} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{15} can be selected from F, I, L, M, V, W, and Y; and

X^{16} can be selected from F, I, L, M, V, W, and Y.

[605] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 126 to SEQ ID NO: 140:

SEQ ID NO: 126	A	G	W	C	K	L	N	P	G	T	Q	V	C	S	F	Y
SEQ ID NO: 127	E	T	P	C	D	L	H	P	G	H	W	S	C	S	M	V
SEQ ID NO: 128	F	F	L	C	D	D	F	P	G	L	P	R	C	E	W	I
SEQ ID NO: 129	G	L	R	C	Y	F	D	P	G	S	Q	I	C	T	F	L
SEQ ID NO: 130	G	Q	R	C	T	Y	D	P	G	Q	D	A	C	V	F	S
SEQ ID NO: 131	G	S	R	C	Y	W	D	P	G	R	E	V	C	I	F	K
SEQ ID NO: 132	K	L	W	C	Q	N	N	P	G	N	S	I	C	D	M	Y
SEQ ID NO: 133	K	S	W	C	F	D	H	P	G	Y	P	I	C	Q	F	Y
SEQ ID NO: 134	R	L	F	C	L	M	N	P	G	P	P	D	C	W	I	Y
SEQ ID NO: 135	R	Q	F	C	L	V	S	P	G	Y	E	D	C	W	F	V
SEQ ID NO: 136	T	R	M	C	F	D	D	P	G	W	H	S	C	P	V	V
SEQ ID NO: 137	T	R	W	C	S	L	H	P	G	V	G	E	C	V	T	L
SEQ ID NO: 138	T	T	V	C	D	Y	H	P	G	S	R	Y	C	I	N	E
SEQ ID NO: 139	Y	A	S	C	T	Y	L	P	G	H	R	G	C	T	L	V
SEQ ID NO: 140	W	L	P	C	D	D	Y	P	G	H	G	Y	C	Y	S	R

[606] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 122 to SEQ ID NO: 140.

[607] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 122 to SEQ ID NO: 140, or a truncated amino acid sequence of any one of SEQ ID NO: 122 to SEQ ID NO: 140, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[608] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 122 to SEQ ID NO: 140, or a truncated amino acid sequence of

any one of SEQ ID NO: 122 to SEQ ID NO: 140, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[609] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (12a) (SEQ ID NO: 141), the amino acid sequence of Formula (12b) (SEQ ID NO: 142), or the amino acid sequence of Formula (12c) (SEQ ID NO: 143):

$$–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}– \quad (12a)$$

$$–X^2–C–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–C–X^{14}– \quad (12b)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}–X^{14}– X^{15}–X^{16}– \quad (12c)$$

wherein,

X^1 can be selected from an amino acid;

X^2 can be selected from an amino acid;

X^3 can be C;

X^4 can be selected from an amino acid;

X^5 can be selected from an amino acid comprising a large hydrophobic side chain;

X^6 can be selected from an amino acid;

X^7 can be selected from an amino acid;

X^8 can be selected from an amino acid;

X^9 can be selected from an amino acid comprising an acidic side chain, a small hydrophobic side chain, or a polar neutral side chain;

X^{10} can be selected from an amino acid;

X^{11} can be selected from an amino acid comprising a large hydrophobic side chain;

X^{12} can be selected from an amino acid comprising a large hydrophobic side chain;

X^{13} can be C;

X^{14} can be selected from an amino acid comprising a large hydrophobic side chain; and

X^{15} can be selected from an amino acid comprising a large hydrophobic side chain.

[610] In IL-2Rα ligands of Formula (12a)-(12c),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 can be C;

X^4 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^5 can be selected from F, I, L, M, V, W, and Y;

X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 can be selected from A, D, E, G, H, N, P, Q, S, T, and Y;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be selected from F, I, L, M, V, W, and Y;

X^{12} can be selected from F, I, L, M, V, W, and Y;

X^{13} can be C;

X^{14} can be selected from F, I, L, M, V, W, and Y; and

X^{15} can be selected from F, I, L, M, V, W, and Y.

[611] In IL-2Rα ligands of Formula (12a)-(12c), X^1 can be selected from S, N, Q, R, and G.

[612] In IL-2Rα ligands of Formula (12a)-(12c), X^2 can be selected from A, H, R, and G.

[613] In IL-2Rα ligands of Formula (12a)-(12c), X^3 can be C.

[614] In IL-2Rα ligands of Formula (12a)-(12c), X^4 can be selected from Q, T, N, M, and S.

[615] In IL-2Rα ligands of Formula (12a)-(12c), X^5 can be selected from L and R.

[616] In IL-2Rα ligands of Formula (12a)-(12c), X^6 can be selected from K, S, R, and V.

[617] In IL-2Rα ligands of Formula (12a)-(12c), X^7 can be selected from W, K, and L.

[618] In IL-2Rα ligands of Formula (12a)-(12c), X^8 can be selected from D, T, L, Q, and A.

[619] In IL-2Rα ligands of Formula (12a)-(12c), X^9 can be selected from E, Y, D, and P.

[620] In IL-2Rα ligands of Formula (12a)-(12c), X^{10} can be selected from G, P, A, E, and S.

[621] In IL-2Rα ligands of Formula (12a)-(12c), X^{11} can be selected from W and L.

[622] In IL-2Rα ligands of Formula (12a)-(12c), X^{12} can be selected from T, V, I, and A.

[623] In IL-2Rα ligands of Formula (12a)-(12c), X^{13} can be C.

[624] In IL-2Rα ligands of Formula (12a)-(12c), X^{14} can be selected from L, V, Q, and I.

[625] In IL-2Rα ligands of Formula (12a)-(12c), X^{13} can be selected from F and A.

[626] In IL-2Rα ligands of Formula (12a)-(12c), X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[627] In IL-2Rα ligands of Formula (12a)-(12c), X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[628] In IL-2Rα ligands of Formula (12a)-(12c), X^3 can be C.

[629] In IL-2Rα ligands of Formula (12a)-(12c), X^4 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[630] In IL-2Rα ligands of Formula (12a)-(12c), X^5 can be L.

[631] In IL-2Rα ligands of Formula (12a)-(12c), X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[632] In IL-2Rα ligands of Formula (12a)-(12c), X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[633] In IL-2Rα ligands of Formula (12a)-(12c), X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[634] In IL-2Rα ligands of Formula (12a)-(12c), X^9 can be selected from D and E.

[635] In IL-2Rα ligands of Formula (12a)-(12c), X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[636] In IL-2Rα ligands of Formula (12a)-(12c), X^{11} can be selected from F, I, L, M, V, W, and Y.

[637] In IL-2Rα ligands of Formula (12a)-(12c), X^{11} can be W.

[638] In IL-2Rα ligands of Formula (12a)-(12c), X^{12} can be selected from F, I, L, M, V, W, and Y.

[639] In IL-2Rα ligands of Formula (12a)-(12c), X^{13} can be C.

[640] In IL-2Rα ligands of Formula (12a)-(12c), X^{14} can be selected from F, I, L, M, V, W, and Y.

[641] In IL-2Rα ligands of Formula (12a)-(12c), X^{15} can be F.

[642] In IL-2Rα ligands of Formula (12a)-(12c), X^3 can be C, X^5 can be L, X^9 can be D or E, X^{11} can be W, X^{13} can be C, and X^{15} can be F.

[643] In IL-2Rα ligands of Formula (12a)-(12c),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 can be C;

X^4 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^5 can be L;

X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 can be selected from D and E;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y:

X^{11} can be selected from F, I, L, M, V, W, and Y;

X^{12} can be selected from F, I, L, M, V, W, and Y;

X^{13} can be C;

X^{14} can be selected from F, I, L, M, V, W, and Y; and

X^{15} can be F.

[644] In IL-2Rα ligands of Formula (12a)-(12c), X^3 can be C, X^5 can be L, X^{11} can be W, X^{13} can be C, and X^{15} can be F.

[645] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 144 to SEQ ID NO: 148:

SEQ ID NO: 144	S	A	C	Q	L	K	W	D	E	G	W	T	C	L	F
SEQ ID NO: 145	N	H	C	T	L	S	K	T	Y	P	W	V	C	V	F
SEQ ID NO: 146	Q	R	C	N	R	S	L	L	D	A	L	I	C	Q	A
SEQ ID NO: 147	R	G	C	M	L	R	L	Q	P	E	L	A	C	V	F
SEQ ID NO: 148	G	G	C	S	L	V	W	A	D	S	W	V	C	I	F

[646] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 141 to SEQ ID NO: 148.

[647] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 141 to SEQ ID NO: 148, or a truncated amino acid sequence of any one of SEQ ID NO: 141 to SEQ ID NO: 148, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[648] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 141 to SEQ ID NO: 148, or a truncated amino acid sequence of any one of SEQ ID NO: 141 to SEQ ID NO: 148, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[649] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (13a) (SEQ ID NO: 149), the amino acid sequence of Formula (13b) (SEQ ID NO: 150), or the amino acid sequence of Formula (13c) (SEQ ID NO: 151):

$$–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}– \quad (13a)$$

$$–X^2–C–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–C–X^{14}– \quad (13b)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}–X^{14}– X^{15}– \quad (13c)$$

wherein,

X^1 can be selected from an amino acid comprising a small hydrophobic side chain or a basic side chain;

X^2 can be selected from an amino acid comprising a small hydrophobic side chain or a basic side chain;

X^3 can be C;

X^4 can be selected from an amino acid comprising a small hydrophobic side chain;

X^5 can be selected from an amino acid comprising a large hydrophobic side chain;

X^6 can be selected from an amino acid comprising a large hydrophobic side chain;

X^7 can be selected from an amino acid comprising a large hydrophobic side chain;

X^8 can be selected from an amino acid;

X^9 can be selected from an amino acid comprising an acidic side chain;

X^{10} can be selected from an amino acid comprising a small hydrophobic side chain;

X^{11} can be selected from an amino acid comprising a large hydrophobic side chain;

X^{12} can be selected from an amino acid comprising a large hydrophobic side chain or an acidic side chain;

X^{13} can be C;

X^{14} can be selected from an amino acid comprising a large hydrophobic side chain; and

X^{15} can be selected from an amino acid comprising a large hydrophobic side chain.

[650] In IL-2Rα ligands of Formula (13a)-(13c),

X^1 can be selected from A, G, H, K, P, R, S, and T;

X^2 can be selected from A, G, H, K, P, R, S, and T;

X^3 can be C;

X^4 can be selected from A, G, P, S, and T;

X^5 can be selected from F, I, L, M, V, W, and Y;

X^6 can be selected from F, I, L, M, V, W, and Y;

X^7 can be selected from F, I, L, M, V, W, and Y;

X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 can be selected from D and E;

X^{10} can be selected from A, G, P, S, and T;

X^{11} can be selected from F, I, L, M, V, W, and Y;

X^{12} can be selected from D, E, F, I, L, M, V, W, and Y;

X^{13} can be C;

X^{14} can be selected from F, I, L, M, V, W, and Y; and

X^{15} can be selected from F, I, L, M, V, W, and Y.

[651] In IL-2Rα ligands of Formula (13a)-(13c), X^1 can be selected from S, R, Q, V, A, and G.

[652] In IL-2Rα ligands of Formula (13a)-(13c), X^2 can be selected from R, G, A, and S.

[653] In IL-2Rα ligands of Formula (13a)-(13c), X^3 can be C.

[654] In IL-2Rα ligands of Formula (13a)-(13c), X^4 can be selected from S, T, Q, and H.

[655] In IL-2Rα ligands of Formula (13a)-(13c), X^5 can be L.

[656] In IL-2Rα ligands of Formula (13a)-(13c), X^6 can be selected from V, Q, A, and R.

[657] In IL-2Rα ligands of Formula (13a)-(13c), X^7 can be selected from W and F.

[658] In IL-2Rα ligands of Formula (13a)-(13c), X^8 can be selected from T, D, S, L, A, E, and Q.

[659] In IL-2Rα ligands of Formula (13a)-(13c), X^9 can be selected from D, G, and E.

[660] In IL-2Rα ligands of Formula (13a)-(13c), X^{10} can be selected from T, S, R, G, A, S, and N.

[661] In IL-2Rα ligands of Formula (13a)-(13c), X^{11} can be W.

[662] In IL-2Rα ligands of Formula (13a)-(13c), X^{12} can be selected from V and E.

[663] In IL-2Rα ligands of Formula (13a)-(13c), X^{13} can be C.

[664] In IL-2Rα ligands of Formula (13a)-(13c), X^{14} can be selected from V and I.

[665] In IL-2Rα ligands of Formula (13a)-(13c), X^{13} can be F.

[666] In IL-2Rα ligands of Formula (13a)-(13c), X^1 can be selected from A, G, P, S, and T.

[667] In IL-2Rα ligands of Formula (13a)-(13c), X^1 can be selected from H, K, and R.

[668] In IL-2Rα ligands of Formula (13a)-(13c), X^2 can be selected from A, G, P, S, and T.

[669] In IL-2Rα ligands of Formula (13a)-(13c), X^2 can be selected from H, K, and R.

[670] In IL-2Rα ligands of Formula (13a)-(13c), X^2 can be selected from R and G.

[671] In IL-2Rα ligands of Formula (13a)-(13c), X^3 can be C.

[672] In IL-2Rα ligands of Formula (13a)-(13c), X^4 can be selected from A, G, P, S, and T.

[673] In IL-2Rα ligands of Formula (13a)-(13c), X^4 can be selected from S and T.

[674] In IL-2Rα ligands of Formula (13a)-(13c), X^5 can be selected from F, I, L, M, V, W, and Y.

[675] In IL-2Rα ligands of Formula (13a)-(13c), X^5 can be L.

[676] In IL-2Rα ligands of Formula (13a)-(13c), X^6 can be selected from F, I, L, M, V, W, and Y.

[677] In IL-2Rα ligands of Formula (13a)-(13c), X^6 can be V.

[678] In IL-2Rα ligands of Formula (13a)-(13c), X^7 can be selected from F, I, L, M, V, W, and Y.

[679] In IL-2Rα ligands of Formula (13a)-(13c), X^7 can be selected from F, W, and Y.

[680] In IL-2Rα ligands of Formula (13a)-(13c), X^7 can be W.

[681] In IL-2Rα ligands of Formula (13a)-(13c), X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[682] In IL-2Rα ligands of Formula (13a)-(13c), X^8 can be selected from A, G, P, S, and T.

[683] In IL-2Rα ligands of Formula (13a)-(13c), X^8 can be A.

[684] In IL-2Rα ligands of Formula (13a)-(13c), X^9 can be selected from D and E.

[685] In IL-2Rα ligands of Formula (13a)-(13c), X^9 can be D.

[686] In IL-2Rα ligands of Formula (13a)-(13c), X^{10} can be selected from A, G, P, S, and T.

[687] In IL-2Rα ligands of Formula (13a)-(13c), X^{10} can be S.

[688] In IL-2Rα ligands of Formula (13a)-(13c), X^{11} can be selected from F, I, L, M, V, W, and Y.

[689] In IL-2Rα ligands of Formula (13a)-(13c), X^{11} can be selected from F, W, and Y.

[690] In IL-2Rα ligands of Formula (13a)-(13c), X^{11} can be W.

[691] In IL-2Rα ligands of Formula (13a)-(13c), X^{12} can be selected from F, I, L, M, V, W, and Y.

[692] In IL-2Rα ligands of Formula (13a)-(13c), X^{12} can be selected from D and E.

[693] In IL-2Rα ligands of Formula (13a)-(13c), X^{12} can be selected from V and E.

[694] In IL-2Rα ligands of Formula (13a)-(13c), X^{12} can be V.

[695] In IL-2Rα ligands of Formula (13a)-(13c), X^{13} can be C.

[696] In IL-2Rα ligands of Formula (13a)-(13c), X^{14} can be selected from F, I, L, M, V, W, and Y.

[697] In IL-2Rα ligands of Formula (13a)-(13c), X^{14} can be I.

[698] In IL-2Rα ligands of Formula (13a)-(13c), X^{15} can be F.

[699] In IL-2Rα ligands of Formula (13a)-(13c), X^2 can be R, X^3 can be C, X^5 can be S, X^6 can be L, X^7 can be V, X^8 can be W, X^{10} can be D, X^{11} can be S, X^{12} can be W, X^{13} can be V, X^{14} can be C, X^{15} can be I, and X^{16} can be F.

[700] In IL-2Rα ligands of Formula (13a)-(13c),

X^1 can be selected from A, D, E, G, P, S, and T;

X^2 can be selected from G and R;

X^3 can be C;

X^4 can be selected from S and T;

X^5 can be L;

X^6 can be V;

X^7 can be selected from F and W;

X^8 can be selected from A, G, P, S, and T;

X^9 can be selected from D and E;

X^{10} can be S;

X^{11} can be W;

X^{12} can be V;

X^{13} can be C;

X^{14} can be I; and

X^{15} can be F.

[701] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 152 to SEQ ID NO: 166:

SEQ ID NO: 152	S	R	C	S	L	V	W	T	D	T	W	V	C	V	F
SEQ ID NO: 153	S	R	C	T	L	V	F	D	D	S	W	V	C	V	F
SEQ ID NO: 154	R	G	C	S	L	V	W	S	G	S	W	E	C	I	F
SEQ ID NO: 155	Q	A	C	Q	L	V	W	L	D	S	W	V	C	I	F
SEQ ID NO: 156	V	G	C	S	L	V	W	T	D	R	W	E	C	I	F
SEQ ID NO: 157	S	G	C	S	L	Q	W	A	D	G	W	V	C	I	F
SEQ ID NO: 158	A	R	C	S	L	V	W	D	E	A	W	V	C	I	F
SEQ ID NO: 159	R	G	C	S	L	V	W	A	G	S	W	E	C	I	F
SEQ ID NO: 160	S	R	C	S	L	V	W	A	E	N	W	V	C	I	F
SEQ ID NO: 161	R	R	C	T	L	V	F	L	D	S	W	E	C	I	F
SEQ ID NO: 162	R	G	C	T	L	A	W	E	D	S	W	V	C	I	F
SEQ ID NO: 163	R	G	C	S	L	R	F	A	E	A	W	E	C	I	F
SEQ ID NO: 164	A	S	C	S	L	V	W	Q	D	S	W	V	C	I	F
SEQ ID NO: 165	S	R	C	S	L	V	W	A	D	S	W	V	C	I	F
SEQ ID NO: 166	G	R	C	H	L	V	W	S	D	R	W	E	C	I	F

[702] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 149 to SEQ ID NO: 166.

[703] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 149 to SEQ ID NO: 166, or a truncated amino acid sequence of any one of SEQ ID NO: 149 to SEQ ID NO: 166, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[704] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 149 to SEQ ID NO: 166, or a truncated amino acid sequence of

any one of SEQ ID NO: 149 to SEQ ID NO: 166, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[705] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (14a) (SEQ ID NO: 167), or the amino acid sequence of Formula (14b) (SEQ ID NO: 168) :

$$–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}– \quad (14a)$$

$$–X^1–C–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–C–X^{14}– \quad (14b)$$

wherein,

X^1 can be selected from an amino acid comprising a small hydrophobic side chain;

X^2 can be C;

X^3 can be selected from an amino acid comprising a small hydrophobic side chain;

X^4 can be selected from an amino acid comprising a large hydrophobic side chain;

X^5 can be selected from an amino acid;

X^6 can be selected from an amino acid comprising a large hydrophobic side chain;

X^7 can be selected from an amino acid comprising an acidic side chain or a polar neutral side chain;

X^8 can be selected from an amino acid;

X^9 can be selected from an amino acid;

X^{10} can be selected from an amino acid comprising a large hydrophobic side chain;

X^{11} can be selected from an amino acid comprising a large hydrophobic side chain;

X^{12} can be selected from an amino acid comprising a large hydrophobic side chain or an acidic side chain;

X^{13} can be C; and

X^{14} can be selected from an amino acid comprising a large hydrophobic side chain.

[706] In IL-2Rα ligands of Formula (14a)-(14b),

X^1 can be selected from A, G, P, S, and T;

X^2 can be C;

X^3 can be selected from A, G, P, S, and T;

X^4 can be selected from F, I, L, M, V, W, and Y;

X^5 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^6 can be selected from F, I, L, M, V, W, and Y;

X^7 can be selected from D, E, N, Q, S, T, and Y;

X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} can be selected from F, I, L, M, V, W, and Y;

X^{11} can be selected from F, I, L, M, V, W, and Y;

X^{11} can be selected from D, E, F, I, L, M, V, W, and Y;

X^{13} can be C; and

X^{14} can be selected from F, I, L, M, V, W, and Y.

[707] In IL-2Rα ligands of Formula (14a)-(14b), X^1 can be selected from G and S.

[708] In IL-2Rα ligands of Formula (14a)-(14b), X^2 can be C.

[709] In IL-2Rα ligands of Formula (14a)-(14b), X^3 can be selected from T, S, M, and V.

[710] In IL-2Rα ligands of Formula (14a)-(14b), X^4 can be selected from L and V.

[711] In IL-2Rα ligands of Formula (14a)-(14b), X^5 can be selected from K, R, M, S, T, and Q.

[712] In IL-2Rα ligands of Formula (14a)-(14b), X^6 can be selected from W, R, and F.

[713] In IL-2Rα ligands of Formula (14a)-(14b), X^7 can be selected from E, D, Q, N, G, and S.

[714] In IL-2Rα ligands of Formula (14a)-(14b), X^8 can be selected from S, G, D, Q, K, and G.

[715] In IL-2Rα ligands of Formula (14a)-(14b), X^9 can be selected from P, D, G, F, and V.

[716] In IL-2Rα ligands of Formula (14a)-(14b), X^{10} can be selected from N and W.

[717] In IL-2Rα ligands of Formula (14a)-(14b), X^{11} can be W.

[718] In IL-2Rα ligands of Formula (14a)-(14b), X^{12} can be selected from T, V, H, and E.

[719] In IL-2Rα ligands of Formula (14a)-(14b), X^{13} can be C.

[720] In IL-2Rα ligands of Formula (14a)-(14b), X^{14} can be selected from Y, E, I, and V.

[721] In IL-2Rα ligands of Formula (14a)-(14b), X^1 can be G.

[722] In IL-2Rα ligands of Formula (14a)-(14b), X^2 can be C.

[723] In IL-2Rα ligands of Formula (14a)-(14b), X^3 can be selected from S and T.

[724] In IL-2Rα ligands of Formula (14a)-(14b), X^3 can be T.

[725] In IL-2Rα ligands of Formula (14a)-(14b), X^4 can be L.

[726] In IL-2Rα ligands of Formula (14a)-(14b), X^5 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[727] In IL-2Rα ligands of Formula (14a)-(14b), X^6 can be W.

[728] In IL-2Rα ligands of Formula (14a)-(14b), X^7 can be selected from D, E, Q, and N.

[729] In IL-2Rα ligands of Formula (14a)-(14b), X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[730] In IL-2Rα ligands of Formula (14a)-(14b), X^9 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[731] In IL-2Rα ligands of Formula (14a)-(14b), X^{10} can be W.

[732] In IL-2Rα ligands of Formula (14a)-(14b), X^{11} can be W.

[733] In IL-2Rα ligands of Formula (14a)-(14b), X^{12} can be selected from F, I, L, M, V, W, and Y.

[734] In IL-2Rα ligands of Formula (14a)-(14b), X^{12} can be selected from D and E.

[735] In IL-2Rα ligands of Formula (14a)-(14b), X^{12} can be selected from E and V.

[736] In IL-2Rα ligands of Formula (14a)-(14b), X^{13} can be C.

[737] In IL-2Rα ligands of Formula (14a)-(14b), X^{14} can be selected from F, I, L, M, V, W, and Y.

[738] In IL-2Rα ligands of Formula (14a)-(14b), X^{14} can be selected from I and V.

[739] In IL-2Rα ligands of Formula (14a)-(14b), X^1 can be G, X^2 can be C, X^3 can be T, X^4 can be L, X^6 can be W, X^{10} can be W, X^{11} can be W, and X^{13} can be C.

[740] In IL-2Rα ligands of Formula (14a)-(14b),

X^1 can be G;

X^2 can be C;

X^3 can be selected from T and S;

X^4 can be L;

X^5 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^6 can be W;

X^7 can be selected from D, E, N, Q, S, T, and Y;

X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} can be W;

X^{11} can be W;

X^{12} can be selected from V and E;

X^{13} can be C; and

X^{14} can be selected from F, I, L, M, V, W, and Y.

[741] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 169 to SEQ ID NO: 174:

SEQ ID NO: 169	G	C	T	L	K	W	E	S	P	N	W	T	C	Y
SEQ ID NO: 170	S	C	T	V	R	W	D	G	D	W	W	V	C	E
SEQ ID NO: 171	G	C	S	L	M	W	Q	D	G	W	W	V	C	I
SEQ ID NO: 172	G	C	T	L	S	W	N	Q	G	W	W	H	C	V
SEQ ID NO: 173	G	C	M	L	T	R	G	K	F	W	W	E	C	I
SEQ ID NO: 174	G	C	V	L	Q	F	S	G	V	W	W	E	C	V

[742] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 167 to SEQ ID NO: 174.

[743] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 167 to SEQ ID NO: 174, or a truncated amino acid sequence of any one of SEQ ID NO: 167 to SEQ ID NO: 174, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[744] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 167 to SEQ ID NO: 174, or a truncated amino acid sequence of

any one of SEQ ID NO: 167 to SEQ ID NO: 174, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[745] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (15a) (SEQ ID NO: 175), the amino acid sequence of Formula (15b) (SEQ ID NO: 176), or the amino acid sequence of Formula (15c) (SEQ ID NO: 177):

$$-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}- \quad (15a)$$

$$-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-C-X^{15}- \quad (15b)$$

$$-X^1-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-C-X^{15}-X^{16}- \quad (15c)$$

wherein,

X^1 can be selected from an amino acid;

X^2 can be selected from an amino acid;

X^3 can be C;

X^4 can be selected from an amino acid comprising a polar/neutral side chain or a basic side chain;

X^5 can be selected from an amino acid comprising a large hydrophobic side chain;

X^6 can be selected from an amino acid;

X^7 can be selected from an amino acid comprising a polar neutral side chain or a basic side chain;

X^8 can be P;

X^9 can be G;

X^{10} can be selected from an amino acid;

X^{11} can be selected from an amino acid;

X^{12} can be selected from an amino acid comprising a large hydrophobic side chain;

X^{13} can be selected from an amino acid comprising an acidic side chain or a polar/neutral side chain;

X^{14} can be C;

X^{15} can be selected from an amino acid comprising a large hydrophobic side chain; and

X^{16} can be selected from an amino acid comprising a large hydrophobic side chain.

[746] In IL-2Rα ligands of Formula (15a)-(15c),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 can be C;

X^4 can be selected from H, K, N, Q, R, S, T, and Y;

X^5 can be selected from F, I, L, M, V, W, and Y;

X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 can be selected from H, K, N, Q, R, S, T, and Y;

X^8 can be P;

X^9 can be G;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be selected from F, I, L, M, V, W, and Y;

X^{13} can be selected from D, E, N, Q, S, T, and Y;

X^{14} can be C;

X^{15} can be selected from F, I, L, M, V, W, and Y; and

X^{16} can be selected from F, I, L, M, V, W, and Y.

[747] In IL-2Rα ligands of Formula (15a)-(15c), X^1 can be selected from Q, A, G, K, L, N, P, Q, S, and T.

[748] In IL-2Rα ligands of Formula (15a)-(15c), X^2 can be selected from R, G, K, T, P, A, S, and H.

[749] In IL-2Rα ligands of Formula (15a)-(15c), X^3 can be C.

[750] In IL-2Rα ligands of Formula (15a)-(15c), X^4 can be selected from Q, M, S, R, T, I, K, R, H, and L.

[751] In IL-2Rα ligands of Formula (15a)-(15c), X^5 can be selected from L, P, M, and V.

[752] In IL-2Rα ligands of Formula (15a)-(15c), X^6 can be selected from S, L, R, Q, F, W, N, I, and G.

[753] In IL-2Rα ligands of Formula (15a)-(15c), X^7 can be selected from K, H, R, W, L, N, F, and V.

[754] In IL-2Rα ligands of Formula (15a)-(15c), X^8 can be selected from S, P, T, and L.

[755] In IL-2Rα ligands of Formula (15a)-(15c), X^9 can be G.

[756] In IL-2Rα ligands of Formula (15a)-(15c), X^{10} can be selected from G, L, S, D, T, E, M, N, F, H, R, K, and P.

[757] In IL-2Rα ligands of Formula (15a)-(15c), X^{11} can be selected from E, Y, R, G, H, S, I, G, L, W, F, and V.

[758] In IL-2Rα ligands of Formula (15a)-(15c), X^{12} can be selected from L, W, Y, H, and V.

[759] In IL-2Rα ligands of Formula (15a)-(15c), X^{13} can be selected from G, E, V, T, Q, and A.

[760] In IL-2Rα ligands of Formula (15a)-(15c), X^{14} can be C.

[761] In IL-2Rα ligands of Formula (15a)-(15c), X^{15} can be selected from M, I, V, L, W, R, and F.

[762] In IL-2Rα ligands of Formula (15a)-(15c), X^{16} can be selected from F, S, and G.

[763] In IL-2Rα ligands of Formula (15a)-(15c), X^1 can be selected from S and T.

[764] In IL-2Rα ligands of Formula (15a)-(15c), X^2 can be selected from S, T, R, and K.

[765] In IL-2Rα ligands of Formula (15a)-(15c), X^3 can be C.

[766] In IL-2Rα ligands of Formula (15a)-(15c), X^4 can be selected from N, Q, S, T, and Y.

[767] In IL-2Rα ligands of Formula (15a)-(15c), X^4 can be T.

[768] In IL-2Rα ligands of Formula (15a)-(15c), X^5 can be selected from L, M, and V.

[769] In IL-2Rα ligands of Formula (15a)-(15c), X^5 can be L.

[770] In IL-2Rα ligands of Formula (15a)-(15c), X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[771] In IL-2Rα ligands of Formula (15a)-(15c), X^7 can be selected from N, K, H, and R.

[772] In IL-2Rα ligands of Formula (15a)-(15c), X^7 can be N.

[773] In IL-2Rα ligands of Formula (15a)-(15c), X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[774] In IL-2Rα ligands of Formula (15a)-(15c), X^8 can be selected from A, G, P, S, and T.

[775] In IL-2Rα ligands of Formula (15a)-(15c), X^8 can be P.

[776] In IL-2Rα ligands of Formula (15a)-(15c), X^9 can be G.

[777] In IL-2Rα ligands of Formula (15a)-(15c), X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[778] In IL-2Rα ligands of Formula (15a)-(15c), X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[779] In IL-2Rα ligands of Formula (15a)-(15c), X^{11} can be selected from A, G, P, S, and T.

[780] In IL-2Rα ligands of Formula (15a)-(15c), X^{11} can be G.

[781] In IL-2Rα ligands of Formula (15a)-(15c), X^{12} can be W.

[782] In IL-2Rα ligands of Formula (15a)-(15c), X^{13} can be selected from N, Q, S, T, and Y.

[783] In IL-2Rα ligands of Formula (15a)-(15c), X^{13} can be selected from D and E.

[784] In IL-2Rα ligands of Formula (15a)-(15c), X^{13} can be selected from E and Q.

[785] In IL-2Rα ligands of Formula (15a)-(15c), X^{13} can be E.

[786] In IL-2Rα ligands of Formula (15a)-(15c), X^{14} can be C.

[787] In IL-2Rα ligands of Formula (15a)-(15c), X^{15} can be selected from F, I, L, M, V, W, and Y.

[788] In IL-2Rα ligands of Formula (15a)-(15c), X^{15} can be selected from M, I, V, L, and F.

[789] In IL-2Rα ligands of Formula (15a)-(15c), X^{15} can be selected from I and V.

[790] In IL-2Rα ligands of Formula (15a)-(15c), X^{16} can be F.

In IL-2Rα ligands of Formula (15a)-(15c), X^3 can be C, X^5 can be L, X^8 can be P, X^9 can be G, X^{12} can be W, X^{13} can be E, X^{14} can be C, and X^{16} can be F.

[791] In IL-2Rα ligands of Formula (15a)-(15c),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 can be C;

X^4 can be selected from N, Q, S, T, and Y;

X^5 can be L;

X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 can be selected from N, Q, S, T, and Y;

X^8 can be P;

X^9 can be G;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be selected from A, G, P, S, and T;

X^{12} can be W;

X^{13} can be selected from E and Q;

X^{14} can be C;

X^{15} can be selected from F, I, L, M, V, W, and Y; and

X^{16} can be F.

[792] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 178 to SEQ ID NO: 195:

SEQ ID NO: 178	Q	R	C	Q	L	S	W	S	G	G	E	L	G	C	M	F
SEQ ID NO: 179	A	G	C	M	L	L	K	P	G	L	Y	W	E	C	I	F
SEQ ID NO: 180	A	R	C	S	L	H	H	T	G	S	R	Y	E	C	I	F
SEQ ID NO: 181	A	T	C	M	L	R	L	L	G	D	G	W	G	C	V	F
SEQ ID NO: 182	G	P	C	R	L	S	N	P	G	T	G	W	E	C	I	F
SEQ ID NO: 183	K	G	C	T	L	Q	N	P	G	S	G	W	V	C	L	F
SEQ ID NO: 184	L	A	C	I	L	S	K	P	G	E	H	W	E	C	L	F
SEQ ID NO: 185	N	G	C	T	L	S	F	S	G	M	S	W	T	C	V	Y
SEQ ID NO: 186	N	S	C	I	L	S	N	P	G	L	G	W	Q	C	V	F
SEQ ID NO: 187	N	T	C	K	L	F	R	S	G	N	I	W	Q	C	I	F
SEQ ID NO: 188	P	S	C	R	L	W	N	P	G	F	G	W	E	C	I	F
SEQ ID NO: 189	Q	S	C	T	L	Q	R	L	G	H	L	Y	Q	C	W	F
SEQ ID NO: 190	S	A	C	T	P	N	W	T	G	R	W	W	E	C	V	F
SEQ ID NO: 191	S	K	C	H	L	I	V	S	G	K	F	H	E	C	V	F
SEQ ID NO: 192	S	S	C	T	L	F	N	P	G	T	G	W	T	C	V	F
SEQ ID NO: 193	S	T	C	R	M	G	N	P	G	G	V	W	G	C	Y	F
SEQ ID NO: 194	T	H	C	L	V	Q	W	P	G	P	V	V	A	C	R	S
SEQ ID NO: 195	T	R	C	R	L	L	K	L	G	S	L	W	E	C	F	G

[793] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 175 to SEQ ID NO: 195.

[794] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 175 to SEQ ID NO: 195, or a truncated amino acid sequence of any one of SEQ ID NO: 175 to SEQ ID NO: 195, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[795] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 175 to SEQ ID NO: 195, or a truncated amino acid sequence of any one of SEQ ID NO: 175 to SEQ ID NO: 195, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[796] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (16a) (SEQ ID NO: 196), or the amino acid sequence of Formula (16b) (SEQ ID NO: 197):

$$–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}– \quad (16a)$$

$$–X^1–C–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}–C–X^{15}– \quad (16b)$$

wherein,

X^1 can be selected from an amino acid;

X^2 can be C;

X^3 can be selected from an amino acid comprising a basic side chain;

X^4 can be selected from an amino acid comprising a large hydrophobic side chain;

X^5 can be selected from an amino acid comprising a basic side chain or a polar/neutral side chain;

X^6 can be selected from an amino acid comprising a basic side chain or a polar/neutral side chain;

X^7 can be selected from an amino acid;

X^8 can be selected from an amino acid;

X^9 can be selected from an amino acid;

X^{10} can be selected from an amino acid;

X^{11} can be selected from an amino acid;

X^{12} can be selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^{13} can be selected from an amino acid comprising an acidic side chain;

X^{14} can be C; and

X^{15} can be selected from an amino acid comprising a large hydrophobic side chain.

[797] In IL-2Rα ligands of Formula (16a)-(16b),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from C;

X^3 can be selected from H, K, and R;

X^4 can be selected from F, I, L, M, V, W, and Y;

X^5 can be selected from H, K, N, Q, R, S, T, and Y;

X^6 can be selected from H, K, N, Q, R, S, T, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be selected from F, H, I, L, M, V, W, and Y;

X^{13} can be selected from D and E;

X^{14} can be C; and

X^{15} can be selected from F, I, L, M, V, W, and Y.

[798] In IL-2Rα ligands of Formula (16a)-(16b), X^1 can be selected from A, K, N, R, and T.

[799] In IL-2Rα ligands of Formula (16a)-(16b), X^2 can be C.

[800] In IL-2Rα ligands of Formula (16a)-(16b), X^3 can be selected from W, R, and T.

[801] In IL-2Rα ligands of Formula (16a)-(16b), X^4 can be selected from R, L, and V.

[802] In IL-2Rα ligands of Formula (16a)-(16b), X^5 can be selected from S, R, Q, K, and H.

[803] In IL-2Rα ligands of Formula (16a)-(16b), X^6 can be selected from W, Q, H, K, F, and R.

[804] In IL-2Rα ligands of Formula (16a)-(16b), X^7 can be selected from R, M, L, A, D, S, and I.

[805] In IL-2Rα ligands of Formula (16a)-(16b), X^8 can be selected from Y, S, P, G, and A.

[806] In IL-2Rα ligands of Formula (16a)-(16b), X^9 can be selected from P, R, Y, G, Q, P, and L.

[807] In IL-2Rα ligands of Formula (16a)-(16b), X^{10} can be selected from T, G, P, N, T, N, and A.

[808] In IL-2Rα ligands of Formula (16a)-(16b), X^{11} can be selected from R, G, F, T, G, S, and E.

[809] In IL-2Rα ligands of Formula (16a)-(16b), X^{12} can be selected from T and W.

[810] In IL-2Rα ligands of Formula (16a)-(16b), X^{13} can be selected from F, E, and S.

[811] In IL-2Rα ligands of Formula (16a)-(16b), X^{14} can be C.

[812] In IL-2Rα ligands of Formula (16a)-(16b), X^{15} can be selected from S, L, N, I, and V.

[813] In IL-2Rα ligands of Formula (16a)-(16b), X^2 can be C.

[814] In IL-2Rα ligands of Formula (16a)-(16b), X^3 can be R.

[815] In IL-2Rα ligands of Formula (16a)-(16b), X^4 can be selected from L and V.

[816] In IL-2Rα ligands of Formula (16a)-(16b), X^5 can be selected from R, K, and H.

[817] In IL-2Rα ligands of Formula (16a)-(16b), X^6 can be selected from R, K, and H.

[818] In IL-2Rα ligands of Formula (16a)-(16b), X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[819] In IL-2Rα ligands of Formula (16a)-(16b), X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[820] In IL-2Rα ligands of Formula (16a)-(16b), X^8 can be G.

[821] In IL-2Rα ligands of Formula (16a)-(16b), X^9 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[822] In IL-2Rα ligands of Formula (16a)-(16b), X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[823] In IL-2Rα ligands of Formula (16a)-(16b), X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[824] In IL-2Rα ligands of Formula (16a)-(16b), X^{12} can be selected from F, I, L, M, V, W, and Y.

[825] In IL-2Rα ligands of Formula (16a)-(16b), X^{12} can be selected from F, W, and Y.

[826] In IL-2Rα ligands of Formula (16a)-(16b), X^{12} can be W.

[827] In IL-2Rα ligands of Formula (16a)-(16b), X^{13} can be E.

[828] In IL-2Rα ligands of Formula (16a)-(16b), X^{14} can be C.

[829] In IL-2Rα ligands of Formula (16a)-(16b), X^{15} can be selected from F, I, L, M, V, W, and Y.

[830] In IL-2Rα ligands of Formula (16a)-(16b), X^{15} can be selected from L, I, and V.

[831] In IL-2Rα ligands of Formula (16a)-(16b), X^2 can be C, X^3 can be R, X^{12} can be W, X^{13} can be E, and X^{14} can be C.

[832] In IL-2Rα ligands of Formula (16a)-(16b),

X^2 can be C;

X^3 can be R;

X^4 can be selected from F, I, L, M, V, W, and Y;

X^5 can be selected from N, Q, S, T, and Y;

X^6 can be selected from N, Q, S, T, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be selected from A, G, P, S, and T;

X^9 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be W;

X^{13} can be E;

X^{14} can be C; and

X^{15} can be selected from F, I, L, M, V, W, and Y.

[833] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 189 to SEQ ID NO: 204:

SEQ ID NO: 198	A	C	W	R	S	W	R	Y	P	T	R	T	F	C	S
SEQ ID NO: 199	K	C	R	L	R	Q	M	S	R	G	G	W	E	C	L
SEQ ID NO: 200	N	C	R	V	R	H	L	P	Y	P	F	W	S	C	L
SEQ ID NO: 201	R	C	R	L	Q	K	A	G	G	N	T	W	E	C	I
SEQ ID NO: 202	R	C	T	L	R	F	D	A	Q	T	G	W	E	C	N
SEQ ID NO: 203	T	C	R	L	K	R	S	G	P	N	S	W	E	C	I
SEQ ID NO: 204	T	C	T	V	H	R	I	G	L	A	E	W	E	C	V

[834] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 196 to SEQ ID NO: 204.

[835] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 196 to SEQ ID NO: 204, or a truncated amino acid sequence of any one of SEQ ID NO: 196 to SEQ ID NO: 204, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[836] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 196 to SEQ ID NO: 204, or a truncated amino acid sequence of any one of SEQ ID NO: 196 to SEQ ID NO: 204, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[837] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (17a) (SEQ ID NO: 205), the amino acid sequence of Formula (17b) (SEQ ID NO: 206), or the amino acid sequence of Formula (17c) (SEQ ID NO: 207):

$$-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}- \quad (17a)$$

$$-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-C-X^{15}- \quad (17b)$$

$$-X^1-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-C\ X^{15}-X^{16}- \quad (17c)$$

wherein,

X^1 can be selected from an amino acid comprising a large hydrophobic side chain;

X^2 can be selected from an amino acid comprising a basic side chain;

X^3 can be C;

X^4 can be selected from an amino acid comprising a basic side chain;

X^5 can be selected from an amino acid comprising a basic side chain or an aromatic side chain or a large hydrophobic side chain;

X^6 can be selected from an amino acid;

X^7 can be selected from an amino acid;

X^8 can be P;

X^9 can be G;

X^{10} can be selected from an amino acid;

X^{11} can be selected from an amino acid;

X^{12} can be selected from an amino acid;

X^{13} can be selected from an amino acid;

X^{14} can be C;

X^{15} can be selected from an amino acid comprising a large hydrophobic side chain; and

X^{16} can be selected from an amino acid comprising a small hydrophobic side chain.

[838] In IL-2Rα ligands of Formula (17a)-(17c),

X^1 can be selected from F, I, L, M, V, W, and Y;

X^2 can be selected from H, K, and R;

X^3 can be C;

X^4 can be selected from H, K, and R;

X^5 can be selected from F, H, I, K, L, M, R, V, W, and Y;

X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be P;

X^9 can be G;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{14} can be C;

X^{15} can be selected from F, I, L, M, V, W, and Y; and

X^{1g} can be selected from F, I, L, M, V, W, and Y.

[839] In IL-2Rα ligands of Formula (17a)-(17c), X^1 can be V.

[840] In IL-2Rα ligands of Formula (17a)-(17c), X^2 can be selected from K, R, T, and Y.

[841] In IL-2Rα ligands of Formula (17a)-(17c), X^3 can be C.

[842] In IL-2Rα ligands of Formula (17a)-(17c), X^4 can be selected from K, F, R, and Y.

[843] In IL-2Rα ligands of Formula (17a)-(17c), X^5 can be selected from L, M, V, and R.

[844] In IL-2Rα ligands of Formula (17a)-(17c), X^6 can be selected from V, S, A, L, and E.

[845] In IL-2Rα ligands of Formula (17a)-(17c), X^7 can be selected from M, E, R, Y, V, and K.

[846] In IL-2Rα ligands of Formula (17a)-(17c), X^8 can be P.

[847] In IL-2Rα ligands of Formula (17a)-(17c), X^9 can be G.

[848] In IL-2Rα ligands of Formula (17a)-(17c), X^{10} can be selected from S, R, L, Q, V, and G.

[849] In IL-2Rα ligands of Formula (17a)-(17c), X^{11} can be selected from G, V, T, M, and E.

[850] In IL-2Rα ligands of Formula (17a)-(17c), X^{12} can be selected from W, S, W, A, and M.

[851] In IL-2Rα ligands of Formula (17a)-(17c), X^{13} can be selected from A, Y, E, V, and H.

[852] In IL-2Rα ligands of Formula (17a)-(17c), X^{14} can be C.

[853] In IL-2Rα ligands of Formula (17a)-(17c), X^{14} can be selected from H, T, L, V, F, and R.

[854] In IL-2Rα ligands of Formula (17a)-(17c), X^{14} can be selected from F, A, and S.

[855] In IL-2Rα ligands of Formula (17a)-(17c), X^1 can be V.

[856] In IL-2Rα ligands of Formula (17a)-(17c), X^2 can be R.

[857] In IL-2Rα ligands of Formula (17a)-(17c), X^3 can be C.

[858] In IL-2Rα ligands of Formula (17a)-(17c), X^4 can be R.

[859] In IL-2Rα ligands of Formula (17a)-(17c), X^5 can be selected from F, I, L, M, V, W, and Y.

[860] In IL-2Rα ligands of Formula (17a)-(17c), X^5 can be selected from F, W, and Y.

[861] In IL-2Rα ligands of Formula (17a)-(17c), X^5 can be selected from H, K, and R.

[862] In IL-2Rα ligands of Formula (17a)-(17c), X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[863] In IL-2Rα ligands of Formula (17a)-(17c), X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[864] In IL-2Rα ligands of Formula (17a)-(17c), X^8 can be P.

[865] In IL-2Rα ligands of Formula (17a)-(17c), X^9 can be G.

[866] In IL-2Rα ligands of Formula (17a)-(17c), X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[867] In IL-2Rα ligands of Formula (17a)-(17c), X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[868] In IL-2Rα ligands of Formula (17a)-(17c), X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[869] In IL-2Rα ligands of Formula (17a)-(17c), X^{13} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[870] In IL-2Rα ligands of Formula (17a)-(17c), X^{14} can be C.

[871] In IL-2Rα ligands of Formula (17a)-(17c), X^{15} can be selected from F, I, L, M, V, W, and Y.

[872] In IL-2Rα ligands of Formula (17a)-(17c), X^{16} can be S.

[873] In IL-2Rα ligands of Formula (17a)-(17c), X^1 can be V, X^2, can be R, X^3 can be C, X^4 can be R, X^{14} can be C, and X^{16} can be S.

[874] In IL-2Rα ligands of Formula (17a)-(17c),

X^1 can be V;

X^2 can be R;

X^3 can be C;

X^4 can be R;

X^5 can be selected from H, F, I, K, L, M, R, V, W, and Y;

X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be P;

X^9 can be G;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{14} can be C;

X^{154} can be selected from F, I, L, M, V, W, and Y; and

X^{16} can be S.

[875] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 208 to SEQ ID NO: 213:

SEQ ID NO: 208	V	K	C	K	L	V	N	P	G	S	G	W	A	C	H	F
SEQ ID NO: 209	V	R	C	F	M	S	E	P	G	R	V	S	Y	C	T	A
SEQ ID NO: 210	V	R	C	R	L	A	R	P	G	L	T	W	E	C	L	S
SEQ ID NO: 211	V	R	C	R	V	L	Y	P	G	Q	M	A	V	C	V	S
SEQ ID NO: 212	V	T	C	Y	R	A	V	P	G	V	E	A	Y	C	F	S
SEQ ID NO: 213	V	Y	C	R	R	E	K	P	G	G	E	M	H	C	R	S

[876] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 205 to SEQ ID NO: 213.

[877] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 205 to SEQ ID NO: 213, or a truncated amino acid sequence of any one of SEQ ID NO: 205 to SEQ ID NO: 213, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[878] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 205 to SEQ ID NO: 213, or a truncated amino acid sequence of any one of SEQ ID NO: 205 to SEQ ID NO: 213, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[879] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (18a) (SEQ ID NO: 214), the amino acid sequence of Formula (18b) (SEQ ID NO: 215), or the amino acid sequence of Formula (18c) (SEQ ID NO: 216):

$$–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}– \quad (18a)$$

$$–X^2–C–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}–C– X^{15}– \quad (18b)$$

$$–X^1–X^2–C–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}–C– X^{15}–X^{16}– \quad (18c)$$

wherein,

X^1 can be selected from an amino acid;

X^2 can be selected from an amino acid;

X^3 can be C;

X^4 can be selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^5 can be selected from an amino acid comprising a large hydrophobic side chain;

X^6 can be selected from an amino acid;

X^7 can be selected from an amino acid;

X^8 can be P;

X^9 can be G;

X^{10} can be selected from an amino acid;

X^{11} can be selected from an amino acid;

X^{12} can be selected from an amino acid;

X^{13} can be selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^{14} can be C;

X^{15} can be selected from an amino acid; and

X^{16} can be selected from an amino acid comprising a large hydrophobic side chain.

[880] In IL-2Rα ligands of Formula (18a)-(18c),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 can be C;

X^4 can be selected from F, H, I, L, M, V, W, and Y;

X^5 can be selected from F, I, L, M, V, W, and Y;

X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be P;

X^9 can be G;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} can be selected from F, H, I, L, M, V, W, and Y;

X^{14} can be C;

X^{15} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y; and

X^{1g} can be selected from F, I, L, M, V, W, and Y.

[881] In IL-2Rα ligands of Formula (18a)-(18c), X^1 can be selected from A, H, Q, R, T, and V.

[882] In IL-2Rα ligands of Formula (18a)-(18c), X^2 can be selected from T, G, L, D, and K.

[883] In IL-2Rα ligands of Formula (18a)-(18c), X^3 can be C.

[884] In IL-2Rα ligands of Formula (18a)-(18c), X^4 can be selected from H, T, P, A, F, Q, and Y.

[885] In IL-2Rα ligands of Formula (18a)-(18c), X^5 can be selected from L, W, G, I, E, M, and R.

[886] In IL-2Rα ligands of Formula (18a)-(18c), X^6 can be selected from L, T, S, M, and N.

[887] In IL-2Rα ligands of Formula (18a)-(18c), X^7 can be selected from A, K, D, E, W, T, and S.

[888] In IL-2Rα ligands of Formula (18a)-(18c), X^8 can be P.

[889] In IL-2Rα ligands of Formula (18a)-(18c), X^9 can be G.

[890] In IL-2Rα ligands of Formula (18a)-(18c), X^{10} can be selected from V, A, S, T, D, Q, and V.

[891] In IL-2Rα ligands of Formula (18a)-(18c), X^{11} can be selected from D, E, W, S, R, and I.

[892] In IL-2Rα ligands of Formula (18a)-(18c), X^{12} can be selected from N, W, G, V, P, and A.

[893] In IL-2Rα ligands of Formula (18a)-(18c), X^{13} can be selected from T, V, P, F, Y, and W.

[894] In IL-2Rα ligands of Formula (18a)-(18c), X^{14} can be C.

[895] In IL-2Rα ligands of Formula (18a)-(18c), X^{14} can be selected from I, S, P, D, H, T, and V.

[896] In IL-2Rα ligands of Formula (18a)-(18c), X^{14} can be selected from F, L, N, I, T, and G.

[897] In IL-2Rα ligands of Formula (18a)-(18c), X^{1} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[898] In IL-2Rα ligands of Formula (18a)-(18c), X^{2} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[899] In IL-2Rα ligands of Formula (18a)-(18c), X^{3} can be C.

[900] In IL-2Rα ligands of Formula (18a)-(18c), X^{4} can be selected from F, H, I, L, M, V, W, and Y.

[901] In IL-2Rα ligands of Formula (18a)-(18c), X^{4} can be selected from F, W, and Y.

[902] In IL-2Rα ligands of Formula (18a)-(18c), X^{5} can be selected from F, I, L, M, V, W, and Y.

[903] In IL-2Rα ligands of Formula (18a)-(18c), X^{6} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[904] In IL-2Rα ligands of Formula (18a)-(18c), X^{7} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[905] In IL-2Rα ligands of Formula (18a)-(18c), X^{8} can be P.

[906] In IL-2Rα ligands of Formula (18a)-(18c), X^{9} can be G.

[907] In IL-2Rα ligands of Formula (18a)-(18c), X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[908] In IL-2Rα ligands of Formula (18a)-(18c), X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[909] In IL-2Rα ligands of Formula (18a)-(18c), X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[910] In IL-2Rα ligands of Formula (18a)-(18c), X^{13} can be selected from F, H, I, L, M, V, W, and Y.

[911] In IL-2Rα ligands of Formula (18a)-(18c), X^{13} can be selected from F, W, and Y.

[912] In IL-2Rα ligands of Formula (18a)-(18c), X^{14} can be C.

[913] In IL-2Rα ligands of Formula (18a)-(18c), X^{15} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[914] In IL-2Rα ligands of Formula (18a)-(18c), X^{16} can be selected from F, I, L, M, V, W, and Y.

[915] In IL-2Rα ligands of Formula (18a)-(18c), X^{3} can be C, X^{8} can be P, X^{9} can be G, and X^{14} can be C.

[916] In IL-2Rα ligands of Formula (18a)-(18c),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 can be C;

X^4 can be selected from F, H, W, and Y;

X^5 can be selected from F, I, L, M, V, W, and Y;

X^6 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be P;

X^9 can be G;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} can be selected from F, H, W, and Y;

X^{14} can be C;

X^{154} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y; and

X^{16} can be selected from F, I, L, M, V, W, and Y.

[917] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 217 to SEQ ID NO: 224:

SEQ ID NO: 217	A	T	C	H	L	L	A	P	G	V	D	N	T	C	I	F
SEQ ID NO: 218	H	G	C	T	L	T	K	P	G	A	E	W	V	C	S	F
SEQ ID NO: 219	Q	L	C	P	W	S	D	P	G	S	W	G	P	C	P	L
SEQ ID NO: 220	R	D	C	A	G	M	E	P	G	T	S	V	F	C	D	N
SEQ ID NO: 221	R	D	C	F	I	L	E	P	G	T	S	V	Y	C	D	L
SEQ ID NO: 222	T	D	C	Q	E	T	W	P	G	D	R	P	W	C	H	I
SEQ ID NO: 223	V	K	C	F	M	S	T	P	G	Q	I	A	Y	C	T	T
SEQ ID NO: 224	V	K	C	Y	R	N	S	P	G	V	E	A	Y	C	V	G

[918] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 214 to SEQ ID NO: 224.

[919] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 214 to SEQ ID NO: 224, or a truncated amino acid sequence of any one of SEQ ID NO: 214 to SEQ ID NO: 224, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[920] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 214 to SEQ ID NO: 224, or a truncated amino acid sequence of any one of SEQ ID NO: 214 to SEQ ID NO: 224, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[921] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (19a) (SEQ ID NO: 225), or the amino acid sequence of Formula (19b) (SEQ ID NO: 226):

$$-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (19a)$$

$$-X^1-C-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}- \quad (19b)$$

wherein,

X^1 can be selected from an amino acid;

X^2 can be C;

X^3 can be selected from an amino acid comprising an acidic side chain or a polar/neutral side chain;

X^4 can be selected from an amino acid comprising an acidic side chain or a polar/neutral side chain;

X^5 can be selected from an amino acid comprising a large hydrophobic side chain;

X^6 can be selected from an amino acid comprising a polar/neutral side chain;

X^7 can be selected from an amino acid;

X^8 can be selected from an amino acid;

X^9 can be selected from an amino acid comprising a large hydrophobic side chain;

X^{10} can be selected from an amino acid;

X^{11} can be selected from an amino acid;

X^{12} can be selected from an amino acid;

X^{13} can be C; and

X^{14} can be selected from an amino acid.

[922] In IL-2Rα ligands of Formula (19a)-(19b),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be C;

X^3 can be selected from D, E, N, Q, S, T, and Y;

X^4 can be selected from D, E, N, Q, S, T, and Y;

X^5 can be selected from F, I, L, M, V, W, and Y;

X^6 can be selected from N, Q, S, T, and Y;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 can be selected from F, I, L, M, V, W, and Y;

X^{10} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} can be C; and

X^{14} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[923] In IL-2Rα ligands of Formula (19a)-(19b), X^1 can be selected from D, P, S, T, W, and Y.

[924] In IL-2Rα ligands of Formula (19a)-(19b), X^2 can be C.

[925] In IL-2Rα ligands of Formula (19a)-(19b), X^3 can be selected from L, Q, M, E, W, and H.

[926] In IL-2Rα ligands of Formula (19a)-(19b), X^4 can be selected from D, R, S, E, and L.

[927] In IL-2Rα ligands of Formula (19a)-(19b), X^5 can be selected from L, P, F, and V.

[928] In IL-2Rα ligands of Formula (19a)-(19b), X^6 can be selected from R, A, K, H, and W.

[929] In IL-2Rα ligands of Formula (19a)-(19b), X^7 can be selected from G, E, K, R, D, G, and Q.

[930] In IL-2Rα ligands of Formula (19a)-(19b), X^8 can be selected from T, Y, S, M, Q, and D.

[931] In IL-2Rα ligands of Formula (19a)-(19b), X^9 can be selected from V, Y, and D.

[932] In IL-2Rα ligands of Formula (19a)-(19b), X^{10} can be selected from G, S, E, N, and Y.

[933] In IL-2Rα ligands of Formula (19a)-(19b), X^{11} can be selected from M, Q, W, V, E, N, R, L, and M.

[934] In IL-2Rα ligands of Formula (19a)-(19b), X^{12} can be selected from V, Q, W, V, E, N, R, L, and M.

[935] In IL-2Rα ligands of Formula (19a)-(19b), X^{13} can be C.

[936] In IL-2Rα ligands of Formula (19a)-(19b), X^{14} can be selected from Q, L, D, N, I, P, and F.

[937] In IL-2Rα ligands of Formula (19a)-(19b), X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[938] In IL-2Rα ligands of Formula (19a)-(19b), X^2 can be C.

[939] In IL-2Rα ligands of Formula (19a)-(19b), X^3 can be selected from H, N, Q, S, T, and Y.

[940] In IL-2Rα ligands of Formula (19a)-(19b), X^3 can be selected from D and E.

[941] In IL-2Rα ligands of Formula (19a)-(19b), X^3 can be selected from Q and E.

[942] In IL-2Rα ligands of Formula (19a)-(19b), X^4 can be selected from D and E.

[943] In IL-2Rα ligands of Formula (19a)-(19b), X^5 can be L.

[944] In IL-2Rα ligands of Formula (19a)-(19b), X^6 can be selected from R, H, and K.

[945] In IL-2Rα ligands of Formula (19a)-(19b), X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[946] In IL-2Rα ligands of Formula (19a)-(19b), X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[947] In IL-2Rα ligands of Formula (19a)-(19b), X^9 can be Y.

[948] In IL-2Rα ligands of Formula (19a)-(19b), X^{10} can be selected from A, G, P, S, and T.

[949] In IL-2Rα ligands of Formula (19a)-(19b), X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[950] In IL-2Rα ligands of Formula (19a)-(19b), X^{12} can be selected from F, I, L, M, V, W, and Y.

[951] In IL-2Rα ligands of Formula (19a)-(19b), X^{12} can be selected from V, L, and M.

[952] In IL-2Rα ligands of Formula (19a)-(19b), X^{13} can be C.

[953] In IL-2Rα ligands of Formula (19a)-(19b), X^{14} can be selected from F, I, L, M, V, W, and Y.

[954] In IL-2Rα ligands of Formula (19a)-(19b), X^{14} can be selected from F, I, and L.

[955] In IL-2Rα ligands of Formula (19a)-(19b), X^2 can be C, X^5 can be L, and X^{13} can be C.

[956] In IL-2Rα ligands of Formula (19a)-(19b),

X^1 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 can be C;

X^3 can be selected from D, E, N, Q, S, T, and Y;

X^4 can be selected from D, E, N, Q, S, T, and Y;

X^5 can be L;

X^6 can be selected from A, G, H, K, P, S, and T;

X^7 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 can be selected from F, I, L, M, V, W, and Y;

X^{10} can be selected from A, G, P, S, and T;

X^{11} can be selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y; and

X^{12} can be selected from F, I, L, M, V, W, and Y;

X^{13} can be C; and

X^{14} can be selected from F, I, L, M, V, W, and Y.

[957] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 227 to SEQ ID NO: 234:

SEQ ID NO: 227	D	C	L	D	L	R	G	T	V	G	M	V	C	Q
SEQ ID NO: 228	P	C	Q	R	L	A	E	Y	Y	S	Q	Q	C	L
SEQ ID NO: 229	S	C	M	D	L	K	G	S	V	G	W	V	C	D
SEQ ID NO: 230	T	C	E	S	L	A	K	M	Y	E	V	E	C	N
SEQ ID NO: 231	T	C	E	S	L	A	R	M	Y	N	E	N	C	I
SEQ ID NO: 232	W	C	W	E	P	H	D	Q	Y	Y	V	R	C	P
SEQ ID NO: 233	Y	C	H	D	F	K	G	T	V	G	T	L	C	I
SEQ ID NO: 234	G	C	Q	L	V	W	Q	D	D	S	Y	M	C	F	Y

[958] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 225 to SEQ ID NO: 234.

[959] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 225 to SEQ ID NO: 234, or a truncated amino acid sequence of any one of SEQ ID NO: 225 to SEQ ID NO: 234, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[960] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 225 to SEQ ID NO: 234, or a truncated amino acid sequence of any one of SEQ ID NO: 225 to SEQ ID NO: 234, wherein the amino acid sequence comprises one or more amino acid substitution such as from 1 to 5 amino acid substitutions.

[961] IL-2Rα ligands provided by the present disclosure can comprise the amino acid sequence of Formula (20a) (SEQ ID NO: 235), or the amino acid sequence of Formula (20b) (SEQ ID NO: 236):

$$–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}– \quad (20a)$$

$$–X^1–C–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–C–X^{14}– \quad (20b)$$

wherein,

X^1 can be W;

X^2 can be C;

X^3 can be selected from F, I, L, M, V, W, and Y;

X^4 can be G;

X^5 can be Q;

X^6 can be P;

X^7 can be L;

X^8 can be selected from F, I, L, M, V, W, and Y;

X^9 can be R;

X^{10} can be selected from H, N, Q, F, I, L, M, V, W, and Y;

X^{11} can be G;

X^{12} can be S;

X^{13} can be C; and

X^{14} can be K.

[962] In IL-2Rα ligands of Formula (20a)-(20b), X^3 can be selected from I and V.

[963] In IL-2Rα ligands of Formula (20a)-(20b), X^8 can be selected from F and Y.

[964] In IL-2Rα ligands of Formula (20a)-(20b), X^{10} can be selected from F, I, L, M, N, Q, S, T, V, W, and Y.

[965] In IL-2Rα ligands of Formula (20a)-(20b), X^{10} can be selected from L and Q.

[966] In IL-2Rα ligands of Formula (20a)-(20b), X^1 can be W, X^2 can be C, X^4 can be G, X^5 can be Q, X^6 can be P, X^7 can be L, X^9 can be R, X^{11} can be G, X^{12} can be S, X^{13} can be C, and X^{14} can be K.

[967] In IL-2Rα ligands of Formula (20a)-(20b),

X^1 can be W;

X^2 can be C;

X^3 can be selected from I and V;

X^4 can be G;

X^5 can be Q;

X^6 can be P;

X^7 can be L;

X^8 can be selected from F and Y;

X^9 can be R;

X^{10} can be selected from F, H, I, L, M, N, Q, S, T, V, W, and Y;

X^{11} can be G;

X^{12} can be S;

X^{13} can be C; and

X^{14} can be K.

[968] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 237 to SEQ ID NO: 307:

SEQ ID NO: 237	W	C	I	G	Q	P	L	F	R	Q	G	S	C	K			
SEQ ID NO: 238	W	C	V	G	Q	P	L	Y	R	L	G	S	C	K			
SEQ ID NO: 239	W	D	Q	F	Q	L	G	W	E	A	G	V	A	A			
SEQ ID NO: 240	F	L	P	W	P	V	Y	F	S	Q	V	L	G	G	G		
SEQ ID NO: 241	Y	V	M	C	S	A	F	G	C	K	S	I					
SEQ ID NO: 242	H	V	I	C	S	V	N	G	G	C	R	G					
SEQ ID NO: 243	I	R	F	C	L	R	S	E	P	T	A	C	W	I	V		
SEQ ID NO: 244	I	R	C	R	Y	E	K	Q	S	G	I	C	L	F			
SEQ ID NO: 245	G	G	C	S	L	V	W	A	D	S	W	V	C	I	F		
SEQ ID NO: 246	G	C	S	L	M	W	Q	D	G	W	W	V	C	I			
SEQ ID NO: 247	E	W	E	C	R	F	L	P	G	R	R	G	C	S	L	F	
SEQ ID NO: 248	K	G	C	T	L	Q	N	P	G	S	G	W	V	C	L	F	
SEQ ID NO: 249	T	C	R	L	K	R	S	G	P	N	S	W	E	C	I		
SEQ ID NO: 250	W	C	I	G	Q	P	L	F	R	Q	G	S	C	K			
SEQ ID NO: 251	A	V	S	C	N	S	W	R	C	I	P	W					
SEQ ID NO: 252	A	V	C	C	D	G	N	S	C	R	R	C					
SEQ ID NO: 253	F	V	H	C	S	L	M	G	C	W	C	G					
SEQ ID NO: 254	R	C	L	D	L	G	G	S	V	G	L	V	C	F			
SEQ ID NO: 255	V	C	F	N	F	R	G	T	V	G	R	H	C	W			
SEQ ID NO: 256	V	R	C	R	Q	N	E	P	G	G	A	Y	W	C	S	S	
SEQ ID NO: 257	C	V	L	R	E	G	A	E	G	W	E	C	V	W	R		
SEQ ID NO: 258	C	R	M	M	Q	G	T	Y	G	W	T	C	L	F			
SEQ ID NO: 259	C	I	L	N	D	T	I	Q	G	W	V	C	I	Y			
SEQ ID NO: 260	C	T	L	Y	R	S	A	P	G	V	W	L	C	I	F		
SEQ ID NO: 261	C	L	V	F	D	Q	Y	G	N	Y	K	R	R	C			
SEQ ID NO: 262	I	V	C	C	N	M	F	G	C	H	T	C	R	N			
SEQ ID NO: 263	Q	V	C	C	T	S	R	G	C	R	V	C	A	P	V		
SEQ ID NO: 264	R	V	C	C	S	M	V	G	C	R	S	C	N	L			
SEQ ID NO: 265	R	V	C	C	T	F	A	G	C	R	V	C	H	K			
SEQ ID NO: 266	R	V	C	C	T	S	D	G	C	R	G	C	R	Q			
SEQ ID NO: 267	T	V	C	C	T	V	Q	G	C	W	P	C	S	R			
SEQ ID NO: 268	V	C	C	H	Q	T	F	G	C	Y	R	C	K	Q			
SEQ ID NO: 269	C	V	V	C	S	A	L	G	C	R	A	C	V	P	R		
SEQ ID NO: 270	V	W	D	C	F	V	R	G	W	E	A	G	V	A	A	V	G	E
SEQ ID NO: 271	L	T	C	L	I	F	K	P	G	T	H	R	H	C	P	V		
SEQ ID NO: 272	R	Y	C	S	P	L	I	P	G	S	A	L	G	C	P	R		
SEQ ID NO: 273	I	R	C	R	L	D	P	P	G	S	Y	K	T	C	V	F		
SEQ ID NO: 274	R	G	V	I	C	N	H	A	G	C	R	I	W	Y	G			
SEQ ID NO: 275	T	T	Q	S	C	T	L	R	Y	C	W	L	L	Q				

SEQ ID NO: 276	W	W	I	S	C	L	R	D	L	R	C	L	E	Y	F
SEQ ID NO: 277	R	H	A	C	K	T	W	Y	R	M	C	I	V	S	
SEQ ID NO: 278	A	V	S	C	S	R	L	T	G	R	C	H	S	L	
SEQ ID NO: 279	W	V	A	C	N	R	V	T	G	S	C	R	P	I	
SEQ ID NO: 280	S	H	G	V	C	C	T	Q	S	S	C	R	S	C	R
SEQ ID NO: 281	W	V	A	C	N	R	L	S	G	C	C	R	P	I	
SEQ ID NO: 282	H	T	V	C	C	Q	D	W	G	C	R	S	C	S	G
SEQ ID NO: 283	M	A	C	C	T	P	R	G	C	R	P	C			
SEQ ID NO: 284	R	S	V	C	C	S	S	Y	G	C	R	A	C	F	G
SEQ ID NO: 285	C	K	L	T	C	T	S	S	T	C	S	C	V	F	
SEQ ID NO: 286	C	M	L	K	C	T	N	A	I	C	E	C	I	F	
SEQ ID NO: 287	C	R	V	W	C	N	Q	A	E	C	M	C	I	F	
SEQ ID NO: 288	S	R	C	S	F	D	V	T	K	Q	E	C	V	F	
SEQ ID NO: 289	L	E	C	Q	P	Y	R	G	P	L	Y	Y	C	Q	D
SEQ ID NO: 290	S	I	C	C	T	P	Q	L	C	H	S	C	D	G	
SEQ ID NO: 291	T	T	C	C	T	S	E	G	C	H	K	C	I	T	L
SEQ ID NO: 292	C	V	A	C	S	S	D	G	C	S	P	I	I	C	
SEQ ID NO: 293	A	I	C	S	E	D	E	G	G	E	L	C	C	W	H
SEQ ID NO: 294	H	E	I	C	C	G	P	P	G	C	H	S	C	S	V	T
SEQ ID NO: 295	L	S	V	C	S	C	P	P	G	Q	L	Y	C	M	V	E
SEQ ID NO: 296	S	T	W	C	C	L	H	P	G	V	G	E	C	Q	A	V
SEQ ID NO: 297	V	T	Q	C	F	D	G	P	G	S	F	R	C	C	Y	Q
SEQ ID NO: 298	R	Q	C	N	C	L	S	P	G	E	L	V	N	C	Q	Q
SEQ ID NO: 299	M	V	S	C	T	D	L	G	C	V	V	V	G	G	G	
SEQ ID NO: 300	V	V	H	C	L	Q	S	G	C	Y	S	V	G	S	G	
SEQ ID NO: 301	T	I	K	C	G	S	S	G	W	C	W	V	E	A	G	
SEQ ID NO: 302	M	V	S	C	T	D	L	G	C	V	V	V	G	G	G	
SEQ ID NO: 303	H	E	I	C	C	G	P	P	G	C	H	S	C	S	V	T
SEQ ID NO: 304	L	S	V	C	S	C	P	P	G	Q	L	Y	C	M	V	E
SEQ ID NO: 305	S	T	W	C	C	L	H	P	G	V	G	E	C	Q	A	V
SEQ ID NO: 306	V	T	Q	C	F	D	G	P	G	S	F	R	C	C	Y	Q
SEQ ID NO: 307	R	Q	C	N	C	L	S	P	G	E	L	V	N	C	Q	Q

[969] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 235 to SEQ ID NO: 307.

[970] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 235 to SEQ ID NO: 307, or a truncated amino acid sequence of any one of SEQ ID NO: 235 to SEQ ID NO: 307, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[971] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 235 to SEQ ID NO: 307, or a truncated amino acid sequence of any one of SEQ ID NO: 235 to SEQ ID NO: 307, wherein the amino acid sequence comprises one or more amino acid substitution such as from 1 to 5 amino acid substitutions.

[972] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 400 to SEQ ID NO: 422:

SEQ ID NO: 400	W	D	D	F	I	L	G	W	E	A	G	V	A	A	V	G	E	V	
SEQ ID NO: 401	F	L	P	W	P	V	Y	F	S	Q	V	L	G	G	R	R			
SEQ ID NO: 402	Y	V	M	C	S	A	F	G	C	K	S	I	G	G					
SEQ ID NO: 403	H	V	I	C	S	V	N	G	G	C	R	G	G	G					
SEQ ID NO: 404	G	G	I	R	F	C	L	R	S	E	P	T	A	C	W	I	V	G	G
SEQ ID NO: 405	G	G	I	R	C	R	Y	E	K	Q	S	G	I	C	L	F	G	G	
SEQ ID NO: 403	G	G	G	G	C	S	L	V	W	A	D	S	W	V	C	I	F	G	G
SEQ ID NO: 406	G	G	G	C	S	L	M	W	Q	D	G	W	W	V	C	I	G	G	
SEQ ID NO: 407	G	G	E	W	E	C	R	F	L	P	G	R	R	G	C	S	L	F	G	G
SEQ ID NO: 408	G	G	K	G	C	T	L	Q	N	P	G	S	G	W	V	C	L	F	G	G
SEQ ID NO: 409	G	G	T	C	R	L	K	R	S	G	P	N	S	W	E	C	I	G	G	
SEQ ID NO: 410	G	G	W	C	I	G	Q	P	L	F	R	Q	G	S	C	K	G	G		
SEQ ID NO: 411	F	V	L	C	G	L	Q	G	C	R	S	G	G							
SEQ ID NO: 412	F	V	P	W	D	E	Y	F	L	Q	I	L	G	G						
SEQ ID NO: 413	G	G	G	W	V	I	C	S	A	L	G	C	P	F	G	G				
SEQ ID NO: 414	G	G	G	R	R	F	C	L	R	S	E	P	T	A	C	W	T	V	G	G
SEQ ID NO: 415	G	G	G	S	R	C	S	L	V	W	A	D	S	W	V	C	I	F	G	G
SEQ ID NO: 416	G	G	D	W	E	C	L	F	L	P	G	R	R	G	C	T	L	F	G	G
SEQ ID NO: 417	F	I	P	W	D	E	Y	F	A	Q	L	L	G	G						
SEQ ID NO: 418	F	V	P	W	D	V	Y	F	S	Q	I	L	G	G						
SEQ ID NO: 419	F	I	P	W	D	E	Y	F	K	Q	V	L	G	G						
SEQ ID NO: 420	F	V	P	W	P	E	Y	F	L	Q	I	M	G	G						
SEQ ID NO: 421	F	I	P	W	E	E	Y	F	S	Q	L	L	G	G						
SEQ ID NO: 422	F	I	P	W	P	E	Y	F	S	Q	L	L	G	G						

[973] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 400 to SEQ ID NO: 422.

[974] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 400 to SEQ ID NO: 422, or a truncated amino acid sequence of any one of SEQ ID NO: 400 to SEQ ID NO: 422, wherein the amino acid sequence can independently comprise from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[975] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 400 to SEQ ID NO: 422, or a truncated amino acid sequence of any one of SEQ ID NO: 400 to SEQ ID NO: 422, wherein the amino acid sequence comprises one or more amino acid substitutions such as from 1 to 5 amino acid substitutions.

[976] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence selected from any one of SEQ ID NO: 1 to SEQ ID NO: 307 and SEQ ID NO. 400 to SEQ ID NO: 422.

[977] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence having greater than 70%, greater than 75%, greater than 80%, greater than 85%, greater than 90%, or greater than 95% sequence similarity to any one of SEQ ID NO: 1 to SEQ ID NO: 307 and SEQ ID NO. 400 to SEQ ID NO: 422.

[978] An IL-2Rα ligand provided by the present disclosure can comprise a truncated amino acid sequence of any one of SEQ ID NO: 1 to SEQ ID NO: 307 and SEQ ID NO. 400 to SEQ ID NO: 422.

[979] An IL-2Rα ligand provided by the present disclosure can comprise an amino acid sequence having greater than 70%, greater than 75%, greater than 80%, greater than 85%, greater than 90%, or greater than 95% sequence similarity to a truncated amino acid sequence of any one of SEQ ID NO: 1 to SEQ ID NO: 307 and SEQ ID NO. 400 to SEQ ID NO: 422.

[980] IL-2Rα ligands provided by the present disclosure can comprise an amino acid sequence selected from SEQ ID NO: 1 to SEQ ID NO: 307 independently comprising one or more such as from 1 to 5 or from 1 to 3 of the following conservative substitutions: amino acids having a small hydrophobic side chain comprising alanine (A), glycine (G), proline (P), serine (S) and threonine (T); amino acids having a hydroxyl-containing side chain comprising serine (S) or threonine (T); amino acids having an acidic side chain comprising aspartate (D) and glutamate (E); amino acids having a polar neutral side chain comprising histidine (H), asparagine (N), glutamine (Q), serine (S), threonine (T), and tyrosine (Y); amino acids having a basic side chain comprising arginine (R), lysine (K), or histidine (H); and amino acids having a large hydrophobic side chain comprising isoleucine (I), leucine (L), methionine (M), valine (V), phenylalanine (F), tyrosine (Y), or tryptophan (W).

[981] Small peptidyl IL-2Rα ligands provided by the present disclosure can include naturally amino acids or can be modified to include non-natural amino acids. Because the small peptidyl IL-2Rα ligands can be chemically synthesized, the peptidyl IL-2Rα ligands can be modified using natural and/or non-natural amino acids to optimize potency and efficacy, and to improve metabolic stability. The small peptidyl IL-2Rα ligands also allow such modifications to be made with a low likelihood of inducing immunogenicity. Also, due to their chemical malleability, peptides can be caged to construct a reversibly inactive prodrug using cell-specific environmental triggers such as proteases, or complexes sensitive to low pH. For example, the pH-dependent binding properties of peptides can be optimized by use of non-natural amino acids having sidechain ionizable groups with a pKa in the range of pH 5.0 to pH 8.0. As with proteins, pharmacokinetic-enhancing moieties, such as polyethylene glycol (PEG), can be appended to peptides, either as part of, or independent of, a "caging" strategy. Also, sites on a peptide can be reserved for attaching a variety of cell targeting moieties, such as tumor-specific antibodies and immune cell-specific targeting moieties. These features of peptidyl IL-2Rα ligands can be exploited in the design of optimal therapeutic candidates based on the peptidyl IL-2Rα ligands provided by the present disclosure.

[982] In addition to peptides consisting only of naturally occurring amino acids, peptidomimetics or peptide analogs are also provided. Peptide mimetics can be used to produce an equivalent or

enhanced therapeutic effect. Peptidomimetics are structurally similar to a paradigm peptide, for example, an IL-2Rα ligand that has a biological or pharmacological activity, but have one or more peptide linkages optionally replaced by a linkage such as $–CH_2–NH–$, $–CH_2–S–$, $–CH_2–CH_2–$, –CH=CH– (*cis* and *trans*), $–COCH_2–$, $–CH(OH)CH_2–$, and $–CH_2SO–$, by methods known in the art.

[983] Substitution of one or more amino acids of a consensus sequence with a D-amino acid of the same type, such as D-lysine in place of L-lysine, may be used to generate more stable peptides. In addition, constrained peptides comprising a consensus sequence, or a substantially identical consensus sequence variation may be generated by methods known in the art; for example, by adding internal cysteine residues capable of forming intramolecular disulfide bridges which cyclize the peptide.

[984] One or more amino acids of an IL-2Rα ligand consensus sequence may be replaced with a synthetic or non-naturally occurring amino acid. Synthetic or non-naturally occurring amino acids refer to amino acids which do not naturally occur *in vivo* but which, nevertheless, can be incorporated into the peptidyl ligands provided by the present disclosure. Suitable examples of synthetic amino acids include the D-α-amino acids of naturally occurring L-α-amino acid as well as non-naturally occurring D- and L-α-amino acids represented by the formula $H_2NCHRCOOH$ where R can be C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{3-8} heterocycloalkyl; an aromatic residue of from 6 to 10 carbon atoms optionally having from 1 to 3 substituents on the aromatic nucleus selected from the group consisting of hydroxyl, lower alkoxy, amino, and carboxyl; –alkylene–Y where alkylene is an alkylene group of from 1 to 7 carbon atoms and Y is selected from a hydroxyl, amino, cycloalkyl, and cycloalkenyl having from 3 to 7 carbon atoms; C_{6-10} aryl, such as from 1 to 3 substituents on the aromatic nucleus selected from the group consisting of hydroxyl, lower alkoxy, amino and carboxyl; heterocyclic of from 3 to 7 carbon atoms and 1 to 2 heteroatoms selected from the group consisting of oxygen, sulfur, and nitrogen; –C(O)R where R is selected from hydrogen, hydroxy, C_{1-4} alkyl, C_{1-4} alkoxy, and $–NR_2$ where each R is independently selected from hydrogen and C_{1-4} alkyl; $–S(O)_nR$ where n is 1 or 2 and R is C_{1-6} alkyl and with the proviso that R does not define a side chain of a naturally occurring amino acid. Examples of synthetic amino acids include amino acids wherein the amino group is separated from the carboxyl group by more than one carbon atom such as b-alanine and g-aminobutyric acid. Other examples of suitable synthetic amino acids include the D-amino acids of naturally occurring L-amino acids, L-1-naphthyl-alanine, L-2-naphthylalanine, L-cyclohexylalanine, L-2-amino isobutyric acid, the sulfoxide and sulfone derivatives of methionine (*i.e.*, $HOOC–(H_2NCH)CH_2CH_2–S(O)_nR^6$) where n and R_6 are as defined above as well as the lower alkoxy derivative of methionine (*i.e.*, $HOOC–(H_2NCH)CH_2CH_2OR$ where R is C_{1-6} alkyl and where R does not define a side chain of a naturally occurring amino acid).

[985] IL-2Rα ligands include bioisosteres and isosteres of the IL-2Rα ligands provided by the present disclosure.

[986] An IL-2Rα ligand provided by the present disclosure can have, for example, less than 20 amino acids, less than 15 amino acids, or less than 10 amino acids. For example, an IL-2Rα ligand can have from 5 to 20 amino acids, or from 10 to 15 amino acids.

[987] IL-2Rα ligands of SEQ ID NO: 1 to SEQ ID NO: 307 exhibit an affinity (IC_{50}) to the human IL-2Rα subunit of less than 100 μM.

[988] An IL-2Rα ligand provided by the present disclosure can comprise, for example, from 5 to 50 amino acids, from 5 to 40 amino acids, from 5 to 35 amino acids, from 5 to 30 amino acids, from 6 to 25 amino acids, or from 7 to 20 amino acids.

[989] An IL-2Rα ligand provided by the present disclosure can bind to the human IL-2Rα subunit, to a mammalian IL-2Rα subunit, or to both the human IL-2Rα subunit and a mammalian IL-2Rα subunit with an IC_{50}, for example, from 1 pM to 100 μM, from 10 pM to 10 μM, from 100 pM to 1 μM, from, 0.001 μM to 1 μM, or from 0.01 μM to 1 μM.

[990] An IL-2Rα ligand provided by the present disclosure can bind to, for example, the human IL-2Rα subunit with an IC_{50} from 0.1 μM to 50 μM.

[991] An IL-2Rα ligand provided by the present disclosure can bind to the human IL-2Rβ subunit and/or human IL-2Rγc subunit with an IC_{50}, for example, of greater than 100 μM, greater than 1 mM, greater than 10 mM, or greater than 100 nM.

[992] IL-2Rα ligands and the sub-genuses of IL-2Rα ligands provided by the present disclosure do not include an IL-2Rα ligand having an amino acid sequence selected from SEQ ID NO: 308 to SEQ ID NO: 397.

SEQ ID NO: 308	F	V	R	C	S	A	N	G	C	V
SEQ ID NO: 309	S	V	R	C	S	A	S	G	C	V
SEQ ID NO: 310	Y	V	A	C	S	V	S	G	C	V
SEQ ID NO: 311	Y	V	I	C	G	A	S	G	C	V
SEQ ID NO: 312	Y	V	R	C	T	A	I	G	C	V
SEQ ID NO: 313	F	V	R	C	S	A	T	G	C	V
SEQ ID NO: 314	Y	V	I	C	S	A	S	G	C	V
SEQ ID NO: 315	W	V	R	C	S	A	S	G	C	V
SEQ ID NO: 316	F	V	R	C	S	A	S	G	C	V
SEQ ID NO: 317	F	V	R	C	T	A	S	G	C	V
SEQ ID NO: 318	F	V	R	C	T	S	D	G	C	V
SEQ ID NO: 319	Y	V	R	C	T	A	S	G	C	V
SEQ ID NO: 320	F	R	R	C	S	A	S	G	C	V
SEQ ID NO: 321	L	R	R	C	S	A	N	G	C	V
SEQ ID NO: 322	L	R	R	C	S	A	N	G	C	V
SEQ ID NO: 323	F	V	R	C	S	L	I	G	C	V
SEQ ID NO: 324	F	V	R	C	N	A	S	G	C	V
SEQ ID NO: 325	F	V	R	C	T	R	E	G	C	V
SEQ ID NO: 326	F	V	R	C	T	S	D	G	C	V
SEQ ID NO: 327	Y	V	I	C	S	A	S	G	C	V
SEQ ID NO: 328	F	V	R	C	T	E	W	G	C	V
SEQ ID NO: 329	F	V	R	C	T	A	S	G	C	I

SEQ ID NO: 330	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	N	A
SEQ ID NO: 331	F	V	R	C	S	E	S	G	C	V	G	S	S	W	S	A
SEQ ID NO: 332	Y	V	R	C	S	A	S	G	C	V	G	S	S	W	F	L
SEQ ID NO: 333	Y	V	R	C	S	D	S	G	C	V	G	S	T	W	G	W
SEQ ID NO: 334	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	V	F
SEQ ID NO: 335	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	V	F
SEQ ID NO: 336	Y	V	L	C	A	L	S	G	C	V	G	S	S	W	S	S
SEQ ID NO: 337	Y	V	R	C	G	E	S	G	C	V	G	S	T	W	S	T
SEQ ID NO: 338	Y	V	R	C	S	A	T	G	C	V	G	S	T	W	T	F
SEQ ID NO: 339	Y	V	R	C	G	E	T	G	C	V	G	S	T	W	S	F
SEQ ID NO: 340	Y	V	R	C	G	V	S	G	C	V	G	S	S	W	V	L
SEQ ID NO: 341	Y	V	R	C	G	E	S	G	C	V	G	S	T	W	S	T
SEQ ID NO: 342	F	V	R	C	S	E	S	G	C	V	G	S	S	W	S	T
SEQ ID NO: 343	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	W	A
SEQ ID NO: 344	Y	V	R	C	S	V	T	G	C	V	G	S	S	W	S	I
SEQ ID NO: 345	Y	V	R	C	S	V	T	G	C	V	G	S	S	W	S	I
SEQ ID NO: 346	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	S	V
SEQ ID NO: 347	F	V	R	C	S	A	D	G	C	V	G	S	S	W	L	Q
SEQ ID NO: 348	Y	V	R	C	S	A	D	G	C	V	G	S	S	W	I	T
SEQ ID NO: 349	Y	V	R	C	N	P	S	G	C	V	G	S	S	W	S	I
SEQ ID NO: 350	Y	V	R	C	S	V	T	G	C	V	G	S	S	W	S	I
SEQ ID NO: 351	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	S	V
SEQ ID NO: 352	F	V	R	C	S	A	N	G	C	V	G	S	T	W	Q	A
SEQ ID NO: 353	Y	V	R	C	T	E	S	G	C	V	G	S	T	W	T	Y
SEQ ID NO: 354	Y	V	R	C	S	V	T	G	C	V	G	S	T	W	S	V
SEQ ID NO: 355	Y	V	R	C	S	E	I	G	C	V	G	S	T	W	S	L
SEQ ID NO: 356	T	V	R	C	S	A	T	G	C	V	G	S	S	W	V	G
SEQ ID NO: 357	Y	V	R	C	S	A	T	G	C	V	G	S	S	W	V	G
SEQ ID NO: 358	F	V	R	C	S	A	S	G	C	V	G	S	S	W	V	G
SEQ ID NO: 359	Y	V	R	C	S	A	D	G	C	V	G	S	T	W	N	L
SEQ ID NO: 360	Y	V	R	S	S	Q	S	G	C	V	G	S	G	W	V	L
SEQ ID NO: 361	Y	V	A	C	S	E	S	G	C	V	G	S	S	W	S	V
SEQ ID NO: 362	F	V	A	C	G	E	L	G	C	V	G	S	S	W	S	I
SEQ ID NO: 363	Y	V	A	C	S	E	S	G	C	V	G	S	S	W	L	A
SEQ ID NO: 364	Y	C	R	C	T	E	S	G	C	V	G	S	T	W	T	Y
SEQ ID NO: 365	F	V	R	C	T	A	I	G	C	V	G	S	S	W	S	V
SEQ ID NO: 366	Y	V	R	C	S	A	D	G	C	V	G	S	S	W	S	A
SEQ ID NO: 367	Y	V	R	C	S	A	S	G	C	V	G	S	S	W	N	Y
SEQ ID NO: 368	Y	V	L	C	S	A	S	G	C	V	G	S	L	W	T	H
SEQ ID NO: 369	Y	V	R	C	T	D	S	G	C	V	G	S	S	W	H	L
SEQ ID NO: 370	Y	V	A	C	S	E	S	G	C	V	G	S	T	W	I	T
SEQ ID NO: 371	Y	V	A	C	S	E	S	G	C	V	G	S	T	W	T	F
SEQ ID NO: 372	Y	V	R	C	G	A	A	G	C	V	V	S	S	W	V	Y
SEQ ID NO: 373	F	V	R	C	G	A	S	G	C	V	G	S	T	W	G	S
SEQ ID NO: 374	Y	V	A	C	S	E	I	G	C	V	G	S	T	W	S	L
SEQ ID NO: 375	Y	V	A	C	S	E	S	G	C	V	G	S	S	W	T	W
SEQ ID NO: 376	Y	V	A	C	S	V	S	G	C	V	G	S	S	W	S	V
SEQ ID NO: 377	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	T	T

SEQ ID NO: 378	Y	V	R	C	S	E	S	G	C	V	S	S	F	W	S	A	P	W	K	A
SEQ ID NO: 379	Y	V	R	C	S	E	N	G	C	V	G	H	S	W	T	Q	G	L	R	T
SEQ ID NO: 380	Y	V	R	C	S	E	S	G	C	V	S	Q	R	P	H	V	L	E	V	W
SEQ ID NO: 381	Y	V	L	C	S	E	R	G	C	V	G	Q	N	W	A	V	G	K	L	P
SEQ ID NO: 382	Y	V	R	C	S	E	I	G	C	V	G	S	H	W	S	S	Y	G	K	H
SEQ ID NO: 383	Y	V	R	C	S	E	N	G	C	V	G	S	S	W	G	R	V	T	L	D
SEQ ID NO: 384	Y	V	R	C	S	E	S	G	C	V	G	C	E	L	V	W	Y	F	I	T
SEQ ID NO: 385	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	G	A	V	A	S	I
SEQ ID NO: 386	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	G	A	V	A	S	I
SEQ ID NO: 387	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	S	V	S	P	R	G
SEQ ID NO: 388	Y	V	R	C	G	E	S	G	C	V	S	S	S	W	S	T	M	G	N	S
SEQ ID NO: 389	Y	V	R	C	S	E	N	G	C	V	G	S	S	W	E	H	S	A	I	I
SEQ ID NO: 390	Y	V	R	C	S	E	G	G	C	V	G	S	T	W	T	A	S	Y	P	N
SEQ ID NO: 391	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	N	G	V	L	S	R
SEQ ID NO: 392	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	N	G	V	L	S	R
SEQ ID NO: 393	T	V	R	C	S	Q	S	G	C	V	G	C	Q	L	V	W	Y	F	T	T
SEQ ID NO: 394	Y	V	N	C	S	Q	S	G	C	V	G	S	T	W	N	G	V	F	S	N
SEQ ID NO: 395	Y	V	A	C	S	E	S	G	C	V	S	V	D	S	S	A	G	A	L	F
SEQ ID NO: 396	Y	V	R	C	N	E	T	G	C	V	G	S	S	W	I	A	A	G	P	F
SEQ ID NO: 397	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	L	F	N	P	W	G

[993] Compounds provided by the present disclosure comprise at least one IL-2Rα ligand. Compounds can comprise, for example, from 1 to 10 IL-2Rα ligands, from 1 to 6 IL-2Rα ligand, or from 1 to 3 IL-2Rα ligands. Examples of compounds comprising at least one IL-2Rα ligand include peptides and conjugates. Examples of conjugates include one or more IL-2Rα ligands bound to a polypeptide, a macromolecule such as a polyethylene glycol, a fusion protein, or a biological molecule such as an antibody.

[994] Functionally, compounds comprising at least one IL-2Rα ligand can be IL-2Rαβγc agonists, IL-2Rα antagonists, IL-2Rαβ antagonists, IL-2Rαγc antagonists, IL-2Rαβγc antagonists, diagnostic reagents, imaging reagents, targeting compounds, cytotoxic compounds, and compounds exhibiting dual pharmacology.

[995] Compounds comprising an IL-2Rα ligand provided by the present disclosure can have a molecular weight, for example, from 1,000 to 400,000 Da, from 1,000 to 200,000 Da, from 1,000 to 100,000 Da, from 1,000 Da to 20,000 Da, from 1,500 Da to 15,000 Da, from 2,000 Da to 10,000 Da, or from 5,000 Da to 10,000 Da.

[996] Compounds comprising an IL-2Rα provided by the present disclosure can be attached to one or more moieties that impart a property to the compound that enhances therapeutic efficacy. Examples of properties include potency, aqueous solubility, polarity, lipophilicity, pharmacokinetics, targeting, bioavailability, pH-dependent binding, bioactivity, pharmacodynamics, cellular activity, metabolism, efficacy, reversible incapacitation (caging), selectivity, or a combination of any of the foregoing.

[997] Compounds comprising an IL-2Rα ligand can comprise one or more moieties that are cleavable *in vivo*. The moiety can be cleavable in a target specific environment such as, for example, by a target specific or target enriched enzyme, or pH. The moiety can be cleavable upon exposure to electromagnetic energy such as visible light or infrared radiation and/or by exposure to thermal energy.

[998] Compounds comprising an IL-2Rα ligand can include a polymer, a peptide, an antibody.

[999] Compounds comprising an IL-2Rα ligand can include a tumor-targeting moiety such as, for example, a tumor-specific antibody, a tumor-specific antibody fragment, a tumor-specific protein, a tumor-specific peptide, a non-peptidyl tumor cell ligand, or a combination of any of the foregoing.

[1000] Compounds comprising an IL-2Rα ligand can comprise a caged molecule or molecules. A caged molecule can in effect encapsulate the compound and can serve to prevent bioactivity in certain tissues, for example, to protect peripheral tissues from the toxicity of IL-2Rαβγc activation.

[1001] Compounds comprising an IL-2Rα ligand can comprise a moiety, wherein the moiety comprises a small molecule, a peptide, a polymer, or an antibody. The small molecule can be a non-peptidyl molecule. The moiety can exhibit a pharmacological effect. The pharmacological effect can manifest when the moiety is bound to the IL-2Rα and/or after the moiety is cleaved from the compound comprising an IL-2Rα ligand.

[1002] Compounds comprising an IL-2Rα ligand can comprise a moiety configured to sustain a circulating reservoir of the compound comprising an IL-2Rα ligand.

[1003] Compounds comprising an IL-2Rα ligand can comprise a moiety configured to target the IL-2R-directed immuno-stimulation of the effector immune cells in the tumor.

[1004] Compounds comprising an IL-2Rα ligand can comprise a moiety configured to target specific immune cells such as Treg cells.

[1005] The moiety can comprise a compound that is toxic to a cell targeted by the compound comprising an IL-2Rα ligand. A compound comprising an IL-2Rα ligand can target cells having a high expression level of the IL-2Rα subunit such as Treg cells and the compound can comprise a moiety toxic to the cells expressing the IL-2Rα subunit such as Treg cells. The toxic moiety can be cleavable or otherwise activated such as by exposure to electromagnetic radiation. The toxic moiety can be activated by exposure to electromagnetic radiation.

[1006] Compounds comprising an IL-2Rα ligand provided by the present disclosure can activate the IL-2 receptor. Compounds comprising an IL-2Rα ligand provided by the present disclosure can inhibit the IL-2 receptor. Certain compounds comprising an IL-2Rα ligand provided by the present disclosure can bind to the IL-2α subunit and prevent other compounds from binding to the IL-2α subunit. Compounds comprising an IL-2Rα ligand can reduce the potency of or interfere with the binding of IL-2R agonists to cells that highly express the IL-2Rα ligand. Compounds comprising an IL-2Rα ligand can reduce the sensitivity of Treg cells to IL-2.

[1007] Peptides provided by the present disclosure include at least one IL-2Rα ligand. A peptide can include, for example, less than 50 amino acids, which include the amino acids constituting the IL-2Rα ligand.

[1008] A peptide comprising an IL-2Rα ligand can comprise, for example, from 5 to 100 amino acids, from 5 to 80 amino acids, from 5 to 50 amino acids, from 10 to 40 amino acids, from 10 to 30 amino acids, or from 15 to 25 amino acids.

[1009] In addition to an IL-2Rα ligand, a peptide can include additional amino acids, for example, for establishing the conformation of an IL-2Rα ligand and/or for coupling the IL-2Rα ligand to other compounds. The additional amino acids can be bonded to the N-terminus and/or to the C-terminus of the IL-2Rα ligand.

[1010] Conjugates provided by the present disclosure include at least one IL-2Rα ligand.

[1011] A conjugate can comprise a polypeptide.

[1012] A polypeptide can be a single chain tandem peptide having two more IL-2Rα ligands. The IL-2Rα ligands can be bonded through amino acid linkers.

[1013] An amino acid linker can comprise, for example, more than one amino acid, greater than 5 amino acids, greater than 10 amino acids, greater than 50 amino acids, or greater than 100 amino acids. A peptide linker can comprise, for example, from 1 to 100 amino acids from 3 amino acids to 75 amino acids, from 5 amino acids to 50 amino acids, or from 10 amino acids to 25 amino acids.

[1014] For example, in a homodimer, the C-terminus of a first IL-2Rα ligand and the C-terminus of a second IL-2Rα ligand can be attached to the linker; the N-terminus of a first IL-2Rα ligand and the N-terminus of a second IL-2Rα ligand can be attached to the linker; or the C-terminus of a first IL-2Rα ligand and the N-terminus of a second IL-2Rα ligand can be attached to the linker.

[1015] A polypeptide comprising an IL-2Rα ligand provided by the present disclosure can comprise, for example, from 5 amino acids to 4,000 amino acids, from 5 amino acids to 3,000 amino acids, from 5 amino acids to 2,500 amino acids, or from 5 amino acids to 2,000 amino acids.

[1016] A polypeptide can be a synthetic peptide or a recombinant polypeptide.

[1017] A single chain tandem peptide can be a heteromer having at least one IL-2Rα ligand in combination with one or more IL-2Rβ ligands and/or one or more IL-2Rγc ligands. For example, a single chain tandem peptide can comprise an IL-2Rα ligand, an IL-2Rβ ligand, and an IL-2Rγc ligand with amino acid linkers coupling adjacent ligands. A single chain tandem peptide can further include additional amino acids at the N-terminus and/or C-terminus of the polypeptide.

[1018] The IL-2Rα and IL-2Rβ ligand and/or IL-2Rγc ligand can be arranged in any order.

[1019] Each of the adjacent ligands can independently be coupled through the N-terminus of each ligand, through the C-terminus of each ligand, through the N-terminus and C-terminus of the adjacent ligands, or through the side chains of the ligands and/or linkers.

[1020] For example, in a heteromer, the C-terminus of an IL-2Rα ligand can be attached to the linker and the N-terminus of an IL-2Rβ ligand or the N-terminus of an IL-2Rγc ligand can be attached to the

linker; the C-terminus of an IL-2Rβ ligand or the N-terminus of an IL-2Rγc ligand can be attached to the linker, or the N-terminus of an IL-2Rα ligand can be attached to the linker. Other examples of suitable linkers include DIG, PEG13, PEG25, PEG1K, PEG2K, PEG3.4K, PEG4K, PEG5K, IDA, IDA-Palm, IDA-Boc, IDA-Ac, IDA-Isovaleric acid, ADA triazine, triazine-Boc, isophthalic acid, 1,3-phenylenediacetic acid, Glu, Asp, D-Glu, D-Asp, 1,4-phenylenediacetic acid, biphenyl diacetic acid, cyclopropylacetic acid, succinic acid, glutaric acid, dodecanedioic acid, suitable aliphatic diacids, suitable aromatic diacids, heteroaromatics, and polyethylene glycols having a molecular weight, for example, from 400 Da to 40,000 Da.

[1021] The individual IL-2Rα ligands can be linked in various ways to produce homodimers or homomers, heteromers, that can be evaluated for IL-2R agonist and/or IL-2R antagonist activity. For example, homodimers of IL-2Rα ligands or heteromers of an IL-2Rα ligand with IL-Rβ ligand and/or IL-2Rγc ligand can function as an IL-2R antagonist. Agonist and antagonist activity can depend on heteromers binding simultaneously to both IL-2Rβ and IL-2Rγc subunits to induce proximity and orientation compatible with signaling or inhibition. Several compound characteristics can influence the activity of homodimers or heteromers such as, for example, the linker structure, the linker length, the peptide ligand orientation, the ECD binding site-specificity of the monomeric peptides, and the affinities of each ligand for the respective receptor subunits. IL-2R agonist and IL-2R antagonist activity can depend on increasing the affinity of the IL-2Rα ligand to the IL-2Rα subunit. Induced receptor subunit orientation and the potential for proper intra-cellular alignment and signaling can be, in part, a function of the orientations in which the peptide ligands link to form the heteromer. To determine suitable induced subunit orientations, adjacent IL-2R ligands can be linked in any of four (4) possible orientations such that the C-termini of both subunit binding ligands are coupled through a linker, the N-termini of both subunit binding ligands are coupled through a linker, or the N-terminus of one binding subunit can be bound through the C-terminus of the other binding subunit through a suitable linker. Homomers and heteromers can also be linked through amino acid side chains. Heteromer linkage orientation can be engineered, for example, by synthesizing ligand monomers with the click functionality, *i.e.*, azide or alkyne, and PEG-linker on either the N-terminus or on the C-terminus.

[1022] A polypeptide can be a synthetically modified polypeptide comprising one or more IL-2Rα ligands. The modifications can be influence, for example, the activity of the polypeptide or the pharmacokinetics of the polypeptide. Examples include polypeptides incorporating polyethylene glycol moieties or albumin binding moieties.

[1023] Compounds comprising an IL-2Rα ligand can be a fusion protein where the fusion partner is from a biological source. An IL-2Rα ligand can be fused to another protein that imparts a desired functionality to the construct. For example, the protein can impart a desired pharmacokinetic profile or to target specific antigens.

[1024] Examples of suitable fusion partners include Fc fusion proteins, IgG fusion proteins, human serum albumin (HSA) fusion proteins, other human proteins and mutants and/or variants thereof; and hydrophilic, biodegradable protein polymers. A fusion protein partner can be a naturally occurring protein, a modified-naturally occurring protein, or a synthetic protein.

[1025] For example, an IL-2Rα ligand provided by the present disclosure can be fused to a protein that increases the circulating half-life of the compound. Fusion of therapeutic proteins with IgG or IgG Fc domains accomplishes this by increasing the hydrodynamic radius of the protein, thus reducing renal clearance, and through Neonatal Fc Receptor (FcRn)-mediated recycling of the fusion protein, and thereby prolonging the circulating half-life. Other fusion proteins can be designed to modify properties such as the pharmacokinetics, biodistribution, pharmacodynamics, pharmacology, cytotoxicity, and/or targeting.

[1026] A fusion protein provided by the present disclosure can comprise a peptide, or multiple tandem peptides provided by the present disclosure linked to one or more fusion protein partners. A fusion protein partner can be linked to the N-terminus and/or the C-terminus of tandem peptides. One or more fusion protein partners can be linked to the N-terminus and/or the C-terminus of tandem peptides. An IL-2Rα ligand can be linked to one or more fusion protein partners, where each of the fusion protein partners can be the same or some of the fusion protein partners can be different than other of the fusion protein partners linked to a peptide.

[1027] The amino acid sequence at the junction between an IL-2Rα ligand and a fusion partner protein can be either a direct fusion of the two protein sequences or a fusion with an intervening linker peptide. Linker peptides can be included as spacers between the two protein moieties. Linker peptides can promote proper protein folding and stability of the component protein moieties, improve protein expression, and enable better bioactivity of the component protein moieties. Peptide linkers used in fusion proteins can be designed to be unstructured flexible peptides. Peptide linkers can be, for example, rich in glycine and serine, such as repeats of a sequence such as, for example, GS, GGS, GGGS, or GGGGS. A flexible linker peptide with a fully extended β-strand conformation can have an end-to-end length of approximately 3.5Å per residue. Thus, a linker peptide of 5, 10, 15, 20 or more than 20 residues can have a maximum fully extended length of 17.5 Å, 35Å, 52.5Å, 70Å, 140 Å, or more than 140 Å, respectively.

[1028] A linker peptide can facilitate obtaining an appropriate conformation and orientation of individual fusion protein moieties to facilitate the engagement of the IL-2Rα ligand with the IL-2Rα subunit, facilitate binding of the IL-2Rα ligand to the IL-2 receptor, enable fusion protein recycling, and prolong the circulating half-life of the active moiety. Because the factors influencing these interactions are difficult to predict, the requirement for and the proper length of a linker peptide must be empirically tested and determined.

[1029] There are multiple options for the design and construction of a fusion protein comprising an IL-2Rα ligand and which can be selected to obtain a compound having the desired biological activity

and pharmaceutical characteristics. Design options include, for example, the nature of the IL-2Rα ligand, the choice of the fusion partner protein moiety, the configuration of fusion partners in the fusion protein, and the amino acid sequence at the junction between the IL-2Rα ligand and the fusion partner protein.

[1030] In general, preparation of the fusion proteins provided by the present disclosure can be accomplished by recognized recombinant DNA techniques involving, for example, polymerase chain amplification reactions (PCR), preparation of plasmid DNA, cleavage of DNA with restriction enzymes, preparation of oligonucleotides, ligation of DNA, isolation of mRNA, introduction of the DNA into a suitable cell, transformation or transfection of a host, culturing of the host. Additionally, fusion proteins can be isolated and purified using chaotropic agents and well known electrophoretic, centrifugation and chromatographic methods.

[1031] Genes encoding fusion proteins provided by the present disclosure involve restriction enzyme digestion and ligation as the basic steps employed to yield DNA encoding the desired fusions. The ends of the DNA fragment may require modification prior to ligation, and this may be accomplished by filling in overhangs, deleting terminal portions of the fragment(s) with nucleases (*e.g.,* ExoIII), site directed mutagenesis, or by adding new base pairs by PCR. Polylinkers and adaptors can be employed to facilitate joining of selected fragments. The expression construct can be assembled in stages employing rounds of restriction, ligation, and transformation of *E. coli.* Numerous cloning vectors suitable for construction of the expression construct are known in the art. The selection of a cloning vector can be influenced by the gene transfer system selected for introduction of the expression construct into the host cell. At the end of each stage, the resulting construct may be analyzed by restriction, DNA sequence, hybridization and PCR analyses.

[1032] Site-directed mutagenesis can be used to introduce specific mutations into the genes encoding the fusion proteins provided by the present disclosure.

[1033] Various promoters (transcriptional initiation regulatory region) may be used. The selection of the appropriate promoter can depend on the proposed expression host. Promoters from heterologous sources may be used as long as they are functional in the chosen host.

[1034] Various signal sequences may be used to facilitate expression of the fusion proteins. Signal sequences can be selected or designed for efficient secretion and processing in the expression host may also be used. A signal sequence which is homologous to the human IL-2 coding sequence may be used for mammalian cells. The signal sequence may be joined directly through the sequence encoding the signal peptidase cleavage site to the protein coding sequence, or through a short nucleotide bridge.

[1035] Nucleic acids encoding a desired fusion protein can be introduced into a host cell by standard techniques for transfecting cells.

[1036] Alternatively, one can use synthetic gene construction for all or part of the construction of the fusion proteins. This can entail *in vitro* synthesis of a designed polynucleotide molecule to encode a

polypeptide molecule of interest. Gene synthesis can be performed utilizing a number of techniques, such as the multiplex microchip-based technology and similar technologies wherein oligonucleotides are synthesized and assembled upon photo-programmable microfluidic chips.

[1037] Fusion proteins provided by the present disclosure can be isolated from harvested host cells or from the culture medium.

[1038] Compounds comprising an IL-2Rα ligand provided by the present disclosure include compounds that act as IL-2Rαβγc agonists.

[1039] An IL-2Rαβγc agonist provided by the present disclosure can comprise synthetic peptides or recombinant peptides linked in tandem to create a single chain peptide comprising an IL-2Rα ligand, an IL-2Rβ ligand, and an IL-2Rγc ligand. The ligands can be in any order and can be separated by amino acid linkers. The synthetic peptides can comprise natural amino acids or peptides with natural amino acids and suitable substitutions with unnatural amino acids. IL-2Rαβγc agonists provided by the present disclosure can be a recombinant fusion protein comprising an IL-2Rα ligand, an IL-2Rβ ligand, and IL-2Rγc ligand and fusion partner such as an Fc protein, an IgG protein, human serum albumin or other natural or designed protein, or a hydrophilic, biodegradable protein polymer. An IL-2Rαβγc agonist can comprise one or more IL-2Rα ligands. An IL-2Rαβγc agonist can comprise an IL-2Rα ligand, an IL-2Rβ ligand, and an IL-2Rγc ligand and include one or more moieties selected to modify the pharmacokinetics of the IL-2Rαβγc agonist such as PEG or an albumin binding moiety.

[1040] An IL-2Rαβγc agonist can bind to IL-2Rα and activate the IL-2 receptor. An IL-2Rαβγc agonist can bind to IL-2Rα with an IC_{50}, for example, less than 100 μM, less than 10 μM, less than 1 μM, less than 100 nM, less than 10 nM, or less than 1 nM. An IL-2Rαβγc agonist can bind to IL-2Rα either competitively or non-competitively with IL-2.

[1041] An IL-2Rαβγc agonist comprising an IL-2Rα ligand, an IL-2Rβ ligand, and an IL-2Rγc ligand can be configured to more potently activate cells expressing the IL-2Rα subunit, thereby facilitating the ability to differentially activate IL-2R expressed on the surface of different cell types by controlling dose of the agonist. For example, when incubated with a heteromeric compound comprising an IL-2Rα ligand, IL-2Rβ ligand, and an IL-2Rγc ligand, primary human peripheral blood mononuclear cells (PBMC) expressing the IL-2Rαβγc subunit, phosphorylate transcription 5 (STAT5) under conditions wherein human peripheral blood mononuclear cells (PBMC) expressing only the IL-2Rβγc subunits, do not phosphorylate transcription 5 (STAT5) to the same degree. A heteromer can comprise an IL-2Rα ligand, IL-2Rβ ligand, an IL-2Rγc ligand, and a linker, where the linker is configured such that the heteromer is an agonist for the IL-2 receptor. A linker can comprise a length that facilitates binding of an IL-2Rα ligand, an IL-2Rβ ligand, and an IL-2Rγc ligand to the IL-2 receptor. For example, a linker can have a length from 10Å to 400 Å, from 10 Å to 300Å, from 10Å to 200Å, 20Å to 100Å, from 30Å to 80Å, or from 40Å to 60Å. A linker can comprise a chemical structure that facilitates simultaneous binding of an IL-2Rα ligand, an IL-2Rβ ligand, an IL-2Rγc

ligand to the respective IL-2 receptor subunits. For example, a linker can comprise a peptide or a hydrocarbon.

[1042] An IL-2Rαβγc agonist can partially activate the IL-2 receptor. Partial activation refers to a level of activation, that is, for example, less than 75% of maximum activation, less than 50%, less than 25%, less than 10%, or less than 1% of the maximum activation. Maximum activation (E_{max}) is the amplitude of cellular signal (activation) achievable at high agonist concentration such as a high concentration of IL-2. Partial IL-2Rαβγc agonists can be effective in modulating the levels of response of IL-2R to activation by the IL-2Rβ and IL-2Rγc subunits among different cell types expressing IL-2R. For example, different cell types are known to vary in expression levels of each of the IL-2R subunits, Rα, Rβ, and Rγc, and to exhibit different sensitivities to IL-2R agonists.

[1043] An IL-2R agonist comprising one or more IL-2Rα ligands can exhibit increased binding and potency on cells expressing the IL-2Rα subunit (such as Tregs). Natural IL-2R agonists, or mutants and modified forms of natural IL-2R agonists such as IL-2, can be modified to include additional IL-2Rα ligands to further increase affinity and potency of these agonists on IL-2Rα expressing cells.

[1044] An IL-2Rαβγc agonist can comprise an IL-2Rα ligand and modified IL-2Rβ and/or IL-2Rγc ligands. Modified IL-2Rβ and IL-2Rγc ligands can be selected or designed to bind and activate IL-2R, but with low or modest affinity and potency to IL-2R. Such IL-2Rαβγc agonists can have greater differential sensitivity for IL-2R activation between cells that highly express IL-2Rα and cells having a low level of IL-2Rα expression. For examples, between Tregs that have a high expression of IL-2Rα and Teff cells that have a low expression level of IL-2Rα.

[1045] An IL-2Rαβγc agonist can comprise one or more IL-2Rα ligands. The presence of multiple IL-2Rα ligands can preferentially increase the potency of the agonists on cells that highly express IL-2Rα compared to cells having low expression levels of IL-2Rα.

[1046] An IL-2Rαβγc agonist can comprise a moiety having an additional pharmacological activity other than that mediated by activation of the IL-2 receptor. The pharmacological activity can be an activity that has a therapeutic efficacy that is synergistic with that of the IL-2Rαβγc agonist or the pharmacological activity can be an activity that has a therapeutic efficacy that is not synergistic with that of the IL-2Rαβγc agonist. For example, a moiety or molecule having a useful pharmacological activity can comprise a checkpoint inhibitor.

[1047] Compounds provided by the present disclosure include IL-2Rα antagonists. An IL-2Rα antagonist is a compound comprising an IL-2Rα ligand that inhibits binding of IL-2 and mutants and modified forms thereof, to the IL-2Rα subunit and/or diminishes IL-2 activation of the IL-2 receptor.

[1048] IL-2Rα antagonists can attenuate the sensitivity of cells expressing the IL-2Rα subunit to activation by IL-2 or mutants and modified forms thereof. Examples of cells expressing the IL-2Rα subunit include Tregs.

[1049] IL-2Rα antagonists include compounds having more than one IL-2Rα ligand and can bind competitively or non-competitively with IL-2 to the IL-2 receptor.

[1050] IL-2Rα antagonists can comprise one or more IL-2Rα ligands and a moiety having a useful pharmacological activity. The moiety can exhibit a pharmacological activity that is synergistic with IL-2Rα inhibition or is not synergistic with inhibition of the IL-2Rα subunit.

[1051] IL-2Rα antagonists further include recombinant fusion proteins.

[1052] An IL-2R antagonist can comprise an IL-2Rα ligand only; an IL-2Rα ligand and an IL-2Rβ ligand; an IL-2Rα ligand and an IL-2Rγc ligand; or an IL-2Rα ligand, an IL-2Rβ ligand, and an IL-2Rγc ligand.

[1053] IL-2R antagonists include compounds that bind to either the IL-2Rα subunit or to the IL-2Rβ or IL-2Rγc subunit and inhibit activation of the IL-2 receptor.

[1054] IL-2R antagonists include compounds that bind to the IL-2Rα subunit and to the IL-2Rβ and/or the IL-2Rγc subunits and inhibit activation of the IL-2 receptor, where the IL-2Rβ and IL-2Rγc ligands are configured to not activate the IL-2 receptor. Such compounds are high affinity antagonists for IL-2R activation and the presence of an IL-2Rα ligand enhances the potency of the IL-2R antagonists.

[1055] IL-2R antagonists include compounds comprising the IL-2Rα and/or the IL-2Rβ and/or the IL-2Rγc ligands, which are configured to exhibit partial activation of the IL-2 receptor. These compounds are examples of partial IL-2R agonists. Such compounds are useful for modulating the level of response of cells to IL-2R agonists among cells having different expression levels of IL-2R subunits. Use of the partial IL-2R agonists/antagonists can modulate the response of cells to IL-2R agonists among cells having different expression levels of the IL-2Rα, IL-2Rβ, and/or IL-2Rγc subunits.

[1056] An IL-2R antagonist can comprise one or more IL-2Rα ligands. An IL-2R antagonist can be a peptide or a polypeptide, which can be synthetic or recombinant. In addition to one or more IL-2Rα ligands, an IL-2R antagonist can comprise one or more IL-2Rβ ligands and/or one or more IL-2Rγc ligands. The IL-2R ligands can be coupled in any order, in any orientation, and can be coupled with linkers. The linkers can comprise natural and/or unnatural amino acids and/or non-peptidyl structures.

[1057] A peptidyl or polypeptidyl IL-2R antagonist can be chemically modified to include, for example, moieties that affect the pharmacokinetics of the IL-2R antagonist such as PEG and albumin-binding moieties.

[1058] IL-2R antagonists further include recombinant fusion proteins.

[1059] Compounds comprising an IL-2Rα ligand include diagnostic reagents. As a diagnostic agent, a compound comprising an IL-2Rα ligand can be used to detect and/or measure cells expressing the IL-2Rα ligand. The compounds can be used to determine the expression level of the IL-2Rα expression of a cell, or population of cells, or of a tissue. The compounds can be used to assess the binding affinity of the IL-2Rα subunits in a cell or population of cells. The compounds may be used to determine the type of cell, for example, based on IL-2Rα expression levels.

[1060] The compounds can be useful for *in vitro* and *in vivo* diagnostics.

[1061] A diagnostic compound comprising an IL-2Rα ligand can comprise a detectable marker. The detectable marker can be cleavable or non-cleavable.

[1062] A detectable marker can comprise, for example, a radiolabel, a fluorescent label, an enzymatic label.

[1063] A diagnostic compound comprising an IL-2Rα ligand can be used to measure cells expressing the IL-2Rα subunit and/or the level of expression of cells expressing the IL-2Rα subunit in a biological sample such as a sample of blood of a patient. Measurements can be made, for example, using flow cytometry. The number of cells expressing the IL-2Rα subunit and/or the expression level of the IL-2Rα subunit, when correlated with a disease in a patient or a pharmacologically significant parameter of the disease in a patient can be used to inform treatment of the disease. For example, if a level of expression of the IL-2Rα subunit is above or below a therapeutically meaningful threshold for a particular disease, a compound comprising an IL-2Rα ligand provided by the present disclosure can be administered to the patient to treat the disease.

[1064] Compounds comprising an IL-2Rα ligand can be attached to a solid support. Based on their ability to bind to the IL-2Rα subunit, the compounds can be used as reagents for detecting IL-2Rα subunits, for example, on living cells, fixed cells, in biological fluids, in tissue homogenates, in purified, and natural in biological materials. In addition, based on their ability to bind the IL-2Rα subunit, the peptides of the present invention can be used, for example, in *in situ* staining, FACS (fluorescence-activated cell sorting), Western blotting, and ELISA. In addition, compounds provided by the present disclosure can be used in receptor purification, or in purifying cells expressing IL-2Rα subunit on the cell surface.

[1065] Compounds comprising an IL-2Rα ligand provided by the present disclosure can also be used as reagents for various medical research and diagnostic uses. Such uses include, for example, use as a calibration standard for quantitating the activities of candidate IL-2R agonists or IL-2R antagonists in functional assays; use to maintain the proliferation and growth of IL-2-dependent cell lines; (3) use in structural analysis of the IL-2-receptor through co-crystallization; use to investigate the mechanism of IL-2 signal transduction/receptor activation; and other research and diagnostic applications wherein the IL-2-receptor is implicated.

[1066] Assessing single patient response to therapy and qualifying a patient for optimal therapy are among the greatest challenges of modern healthcare and relate to trends in personalized medicine. A compound comprising an IL-2Rα ligand can have target selectivity for diseases in which cells associated with the etiology of the disease express the IL-2Rα ligand. For example, a compound comprising an IL-2Rα ligand radiolabeled for positron emission tomography (PET) or single photon emission computed tomography (SPECT) can be used to predict the targeting of the treatment based on a single-study, case-by-case patient analysis thus excluding subjects that are expected not to benefit from treatment with a therapeutic compound affecting the activity of the IL-2Rα subunit. PET/SPECT scans using radiolabeled a compound comprising an IL-2Rα ligand, once correlated to

the concentration of a compound comprising an IL-2Rα ligand can provide a three-dimensional distribution map, which can then be used for macroscopic dose calculations.

[1067] Compounds comprising an IL-2Rα ligand can comprise one or more imaging agents. The IL-2Rα ligand can direct and localize the compound to cells, populations of cells, and tissue expressing the IL-2Rα subunit. The imaging compounds can comprise one or more imaging agents such as radiolabels, fluorescent labels, enzymatic labels, or PET imaging agents.

[1068] The imaging agents can be used to determine the number of cells expressing the IL-2Rα subunit, the expression level of cells expressing the IL-2Rα subunit, or properties of the IL-2Rα subunit such as the affinity of the IL-2Rα subunit to a particular IL-2Rα ligand and/or compound comprising an IL-2Rα ligand. The imaging agents can be used, for example, to evaluate cancer cells expressing the IL-2Rα receptor, or to evaluate Treg and/or Teff cells.

[1069] The label can be detected to determine a biodistribution of the compound in a patient or to assess the potential for therapeutic efficacy. For examples, tumors expressing high levels of the IL-2R receptor and/or the IL-2Rα subunit may be attractive targets for compounds comprising an IL-2Rα ligand provided by the present disclosure.

[1070] The imaging agents can be used to evaluate cells expressing the IL-2Rα subunit before therapy, during therapy, and/or following therapy.

[1071] Imaging agents comprising an IL-2Rα ligand can further comprise a moiety capable of binding to a cell surface and in particular to a protein expressed on the cell surface. The protein can be indicative of a certain cell type and is referred to as a cell surface marker. Imaging agents comprising both an IL-2Rα ligand and a cell surface marker can be used to assess cells, a population of cells, and/or a tissue expressing both the IL-2Rα subunit and the cell surface marker. Assessment can include determining the number of cells expressing both the IL-2Rα subunit and the cell surface marker, the expression levels of the IL-2Rα subunit and the cell surface marker, and/or the affinity of the imaging agent to the IL-2Rα subunit and/or the cell surface marker.

[1072] Cells expressing both the IL-2Rα subunit and the cell surface marker can be, for example, Tregs and/or activated Teff cells.

[1073] The imaging agents can be used to evaluate cells expressing the IL-2Rα subunit and the cell surface marker before therapy, during therapy, and/or following therapy.

[1074] As a practical example, T cell infiltration of tumor lesions is a known prognostic factor in several tumor types and is used as a treatment mechanism in some of these tumor types. For example, in metastatic melanoma, treatment with immune checkpoint inhibitors induces clinical benefit in about 30-50% of the patients. Tumor-infiltrating T cells express the IL-2 receptor on their surface. Therefore, these T cells can be visualized by molecular imaging with a compound comprising an IL-2Rα ligand and a radiolabel such as a PET tracer.

[1075] As another example, IL-2 is synthesized and secreted by activated T lymphocytes, especially $CD8^+$ CTL and $CD4^+$ Th1 lymphocytes. T lymphocyte activation is observed in many types of

inflammatory diseases, such as inflammatory degenerative diseases, graft rejection, tumor inflammation, organ-specific autoimmune diseases, and adipose inflammatory insulin resistance. IL-2 binds with high affinity to the cell membrane IL-2 receptor, which is mainly expressed on the cell surface of activated T lymphocytes. PET imaging of activated T lymphocytes by a radiolabeled compound comprising an IL-2Rα ligand therefore provides an *in vivo*, dynamic approach in studying the immune-cell infiltration in these inflammatory diseases.

[1076] Compounds comprising IL-2Rα ligands can comprise a cell-specific targeting moiety or molecule.

[1077] A cell-specific targeting moiety can comprise a moiety that has an affinity for a component on the surface of a cell such as a receptor, a protein, or an epitope. A moiety can comprise, for example, a ligand or an antibody having an affinity to a cell surface component.

[1078] The targeting moiety can direct and concentrate compounds comprising an IL-2Rα ligand at the cells, population of cells, or tissue targeted by the targeting moiety.

[1079] The targeting moiety can enhance the potency of IL-2R agonism or IL-2R antagonism for the cells or population of cells being targeted.

[1080] The targeting moiety can provide a differential response to IL-2R agonism or to IL-2R antagonism between the cells being targeted and the cells not being targeted by the targeting moiety.

[1081] The targeting moiety can provide a differential response to IL-2R agonism or IL-2R antagonism between cells having a high expression level of the targeted component and cells having a lower expression level of the targeted component.

[1082] Compounds comprising an IL-2Rα ligand can further comprise a bioactive moiety or a bioactive molecule. A compound comprising an IL-2Rα ligand can be used to deliver the bioactive moiety or bioactive molecule to cells, to a population of cells, or to a tissue expressing the IL-2Rα subunit.

[1083] The bioactive moiety or molecule can be non-cleavable and capable of exerting a biological activity when bound to the compound comprising an IL-2Rα ligand.

[1084] The bioactive moiety or molecule can be cleavable. The moiety can be cleavable by any suitable mechanism such as by pH, enzymatic, thermal, and/or electromagnetic mechanisms. Electromagnetic mechanisms include, for example, exposing the compounds to infrared, visible, or ultraviolet radiation, where the bioactive moiety is attached to the compounds comprising an IL-2Rα ligand through a photolabile moiety capable of being cleaved by the radiation.

[1085] The bioactive molecule can be non-cleavable but otherwise activatable, such as for example, activatable by exposure to electromagnetic radiation.

[1086] IL-2Rα ligands can be selected to have enhanced binding to the IL-2Rα subunit at a certain pH. For example, a pH-selective IL-2Rα ligand can have a greater affinity to the IL-2Rα subunit at low pH commensurate with that of a solid tumor microenvironment. Compounds comprising low-pH

selective IL-2Rα ligands can be used to preferentially target cells in low pH environments expressing the IL-2Rα subunit compared to cells in normal pH environments associated with healthy tissue.

[1087] Thus, compounds comprising selective IL-2Rα ligands such as pH-selective IL-2Rα ligands can be used to deliver bioactive moieties and molecules to cells targeted by the selective IL-2Rα ligands.

[1088] A bioactive moiety or bioactive molecule can itself be selective for a particular cell population. For example, a bioactive moiety or bioactive molecule can exhibit a greater or lesser affinity, potency, and/or activity at the cell being targeted by a selective or IL-2Rα ligand. For example, the bioactive moiety or molecule can exhibit greater bioactivity in a low pH tumor microenvironment when targeted by a pH-selective IL-2Rα ligand. In this example, the bioactive moiety is directed to cells located in the low-pH tumor microenvironment that express the IL-2Rα subunit by the pH-selective IL-2Rα ligand. Thus, the activity of the pH-selective bioactive moiety is enhanced in the low-pH tumor microenvironment.

[1089] Compounds comprising an IL-2Rα ligand can further comprise a cytotoxic moiety or molecule. Such compounds can be used to deliver a cytotoxic compound to a cell expressing the IL-2Rα subunit such as Tregs. The cytotoxic moiety or molecule can exert cytotoxicity when bound to the compound or can be cleavable and the moiety or molecule can be cytotoxic when released from the compound; or the cytotoxic moiety can be activated by electromagnetic radiation.

[1090] The cytotoxic moiety or molecule can be used to deplete cells expressing the IL-2Rα ligand being targeted.

[1091] IL-2Rα ligand-containing cytotoxic compounds can have more than one IL-2Rα subunit and thereby can exhibit a higher affinity and/or selectivity to cells, populations of cells, and tissue that highly express the IL-2Rα subunit compared to cells having a lower expression level of the IL-2Rα subunit.

[1092] IL-2Rα ligand-containing cytotoxic compounds can further include a cell surface targeting component. Such cytotoxic compounds can exhibit enhanced efficacy to cells, populations of cells, and tissue expressing both the IL-2Rα subunit and the surface target component.

[1093] Examples of suitable cytotoxic molecules include anti-microtubule agents, alkylating agents, and DNA minor groove binding agents.

[1094] These therapeutic strategies for targeting IL-2Rα expressing cells with cytotoxic compounds have been demonstrated.

[1095] As an example, denileukin diftitox (DAB-IL-2, Ontak) is a diphtheria-toxin–based fusion protein that depletes CD25-positive cells including regulatory T cells and has been approved for the treatment of persistent or recurrent cutaneous T cell lymphoma. Significant toxicities of the drug include acute hypersensitivity, vascular leak syndrome and impaired immune function. The latter two toxicities are due to nonspecific binding of immunotoxin to macrophages and activated lymphocytes. A modified immunotoxin was developed to the efficacy and reduce the toxicity. A modified

diphtheria toxin (DT) served as the cytotoxic moiety and IL-2 served as the targeting moiety for targeting cancer cells that overexpress the IL-2 receptor. T cells, B cells, macrophages and natural killer cells express the IL-2Rβ and IL-2Rγc subunits, whereas the IL-2Rα subunit is uniquely expressed on cancer cells and activated T cells. Targeting the IL-2Rα subunit eliminated toxicity.

[1096] Cytotoxicity of this recombinant protein was observed to be more than denileukin diftitox for cells with higher IL-2Rα expression whereas in cells expressing both IL-2Rα subunit and the IL-2Rβ subunit, cytotoxicity varies from cell line to cell line. The immunotoxin exhibited comparable efficacy to denileukin diftitox and was more specifically targeted to cells expressing the IL-2Rα subunit. The fusion protein depletes IL-2Rα-positive cells including Tregs and has been approved for the treatment of persistent or recurrent cutaneous T cell lymphoma.

[1097] Another example of an IL-2Rα-targeted cytotoxic compound is ^{90}Y-daclizumab, an anti-CD25 monoclonal antibody for treating relapsed Hodgkin's lymphoma. Using the anti-CD25 monoclonal antibody, daclizumab was directed toward nonmalignant T cells expressing the IL-2Rα subunit, rather than the tumor cells. ^{90}Y provided strong β emissions that killed antigen-non-expressing tumor cells at a distance by a crossfire effect. Furthermore, the strong β irradiation killed normal cells in the tumor microenvironment that nurture the malignant cells in the lymphomatous mass and thereby provided meaningful treatment of the Hodgkin's lymphoma.

[1098] Compounds comprising an IL-2Rα ligand can further comprise a moiety having a useful pharmacological activity.

[1099] The pharmacological moiety can function synergistically with IL-2R agonist activity or synergistically with IL-2R antagonist activity, or the pharmacological moiety may not exhibit synergism with activity of the IL-2Rα subunit.

[1100] Examples of suitable pharmacological moieties include antibodies and antibody fragments that are inhibitors of checkpoint molecules, pro-apoptotic and anti-apoptotic molecules, cytotoxic molecules, agonists of chemokine, antagonists of chemokine, cytokine, growth factor and other cell surface rectors, and ligands and inhibitors of cell surface adhesion molecules such as integrins.

[1101] Peptides provided by the present disclosure can be synthesized by methods known in the art, for example, by using standard solid phase techniques.

[1102] A peptide comprising an IL-2Rα ligand provided by the present disclosure can be modified, for example, by phosphorylation, and by other methods known in the art. Thus, the peptides provided by the disclosure can also serve as a basis to prepare peptide mimetics with similar biological activity.

[1103] A variety of techniques are available for constructing peptide mimetics with the same or similar desired biological activity as a corresponding peptide but with more favorable activity than the peptide with respect to solubility, stability, and susceptibility to hydrolysis and proteolysis.

[1104] Pharmaceutical compositions provided by the present disclosure comprise a compound comprising an IL-2Rα ligand.

[1105] Pharmaceutical compositions provided by the present disclosure can comprise a therapeutically effective amount of a compound comprising an IL-2Rα ligand or a pharmaceutically acceptable salt thereof together with a suitable amount of one or more pharmaceutically acceptable vehicles so as to provide a composition for administration to a patient. Suitable pharmaceutical vehicles and methods of preparing pharmaceutical compositions are known.

[1106] A pharmaceutical composition can comprise a therapeutically effective amount of one or more compounds comprising an IL-2Rα ligand.

[1107] A compound comprising an IL-2Rα ligand and/or pharmaceutical composition thereof can be used in an amount effective to achieve an intended purpose. For example, for use to treat a disease such as cancer or an autoimmune disease, a compound comprising an IL-2Rα ligand and/or pharmaceutical compositions thereof, can be administered a therapeutically effective amount for treating the cancer or the autoimmune disease.

[1108] The amount of a compound comprising an IL-2Rα ligand and/or pharmaceutical composition thereof that will be effective in the treatment of a particular disease can depend on, among other factors, the patient being treated, the severity of the disease, the etiology of the disease, the manner of administration and the judgment of the prescribing physician, and can be determined by standard clinical techniques known in the art.

[1109] A therapeutically effective dose of a compound comprising an IL-2Rα ligand and/or pharmaceutical composition thereof can provide a therapeutic benefit without causing substantial toxicity. Toxicity of a compound comprising an IL-2Rα ligand and/or pharmaceutical compositions thereof may be determined using standard pharmaceutical procedures. The dose ratio between toxic and therapeutic effect is the therapeutic index. A compound comprising an IL-2Rα ligand and/or pharmaceutical composition thereof can exhibit a high therapeutic index in treating a disease such as cancer or an autoimmune disease. A dose of a compound comprising an IL-2Rα ligand and/or pharmaceutical composition thereof can be within a range of circulating concentrations that include an effective dose with minimal toxicity.

[1110] A dose of a compound comprising an IL-2Rα ligand provided by the present disclosure and appropriate dosing intervals may be selected to maintain a sustained therapeutically effective concentration of the compound comprising an IL-2Rα ligand provided by the present disclosure in the blood of a patient, and in certain embodiments, without exceeding a minimum adverse concentration.

[1111] Pharmaceutical compositions provided by the present disclosure may further comprise one or more pharmaceutically active compounds in addition to a compound comprising an IL-2Rα ligand provided by the present disclosure. Such compounds may be provided, for example, to treat the disease being treated with a compound comprising an IL-2Rα ligand or to treat a disease, disorder, or condition other than the disease being treated with the compound comprising an IL-2Rα ligand, to treat a side-effect caused by administering the compound comprising an IL-2Rα ligand, to augment

the efficacy of the a compound comprising an IL-2Rα ligand, and/or to modulate the activity of the compound comprising an IL-2Rα ligand.

[1112] A compound comprising an IL-2Rα ligand provided by the present disclosure may be used in combination with at least one other therapeutic agent. A compound comprising an IL-2Rα ligand may be administered to a patient together with another compound for treating the disease. The at least one other therapeutic agent may be a different compound comprising an IL-2Rα ligand. A compound comprising an IL-2Rα ligand and the at least one other therapeutic agent may act additively or synergistically. The at least one additional therapeutic agent may be included in the same pharmaceutical composition or vehicle comprising the compound comprising an IL-2Rα ligand or may be in a separate pharmaceutical composition or vehicle. Accordingly, methods provided by the present disclosure further include, in addition to administering a compound comprising an IL-2Rα ligand, administering one or more therapeutic agents effective for treating the disease being treated by the compound comprising an IL-2Rα ligand or a different disease. Methods provided by the present disclosure include administration of a compound comprising an IL-2Rα ligand and one or more other therapeutic agents provided that the combined administration does not inhibit the therapeutic efficacy of the compound comprising an IL-2Rα ligand and/or does not produce adverse combination effects. A pharmaceutical composition comprising a compound comprising an IL-2Rα ligand provided by the present disclosure may be administered with one or more substances, for example, to enhance, modulate and/or control release, bioavailability, therapeutic efficacy, therapeutic potency, and/or stability, of the compound comprising an IL-2Rα ligand. For example, a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand can be co-administered with an active agent having pharmacological effects that enhance the therapeutic efficacy of the compound comprising an IL-2Rα ligand.

[1113] Compounds comprising an IL-2Rα ligand provided by the present disclosure or a pharmaceutical composition thereof may be included in a kit that may be used to administer the compound to a patient for therapeutic purposes. A kit may include a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand provided by the present disclosure suitable for administration to a patient and instructions for administering the pharmaceutical composition to the patient. The kit can be a kit, for example for treating cancer or a kit for treating an autoimmune disease. A kit for use in treating cancer or an autoimmune disease in a patient can comprise a compound comprising an IL-2Rα ligand provided by the present disclosure, a pharmaceutically acceptable vehicle for administering the compound, and instructions for administering the compound to a patient.

[1114] The pharmaceutical compositions can be included in a container, pack, or dispenser together with instructions for administration. Instructions supplied with a kit may be printed and/or supplied, for example, as an electronic-readable medium, a video cassette, an audiotape, a flash memory device,

or may be published on an internet web site or distributed to a patient and/or health care provider as an electronic communication.

[1115] Compounds comprising an IL-2Rα ligand provided by the present disclosure may be used for treating cancer in a patient. The cancer can be, for example, a solid tumor or a metastasis.

[1116] A compound comprising an IL-2Rα ligand provided by the present disclosure or a pharmaceutical composition thereof may be administered to treat a cancer known to be treated by activation or inhibition of the IL-2R receptor. Compounds comprising an IL-2Rα ligand provided by the present disclosure or a pharmaceutical composition thereof may be administered to treat a cancer known to be treated by activation or inhibition of the IL-2Rβγc subunits and where simultaneous activation of the IL-2Rα subunit enhances therapeutic efficacy, modulates therapeutic efficacy, enhances selective therapeutic efficacy, and/or minimizes unwanted side effects.

[1117] Compounds comprising an IL-2Rα ligand provided by the present disclosure or a pharmaceutical composition thereof can be used to treat, for example, one or more of the following cancers: acute lymphoblastic leukemia, acute myeloid leukemia, adrenocortical carcinoma, appendix cancer, astrocytoma, atypical teratoid/rhabdoid tumor, basal cell carcinoma (nonmelanoma), B-cell lymphoma, bladder cancer, bone cancer, brain and spinal cord tumors, brain stem cancer, brain tumor, breast cancer, bronchial tumors, Burkitt lymphoma, carcinoid tumor, carcinoma of head and neck, central nervous system embryonal tumors, cerebellar astrocytoma, cerebral astrocytoma/malignant glioma, cervical cancer, chordoma, chronic lymphocytic leukemia, chronic myelogenous leukemia, colorectal cancer, craniopharyngioma, cutaneous T-cell lymphoma, desmoplastic small round cell tumor, ductal carcinoma, dye cancer, endocrine pancreas tumors (islet cell tumors), endometrial cancer, ependymoblastoma, esophageal cancer, esthesioneuroblastoma, Ewing family of tumors, extracranial germ cell tumor, extrahepatic bile duct cancer, gallbladder cancer, gastric cancer, gastrointestinal carcinoid tumor, gastrointestinal stromal tumor, gestational trophoblastic tumor, glioblastoma, glioma, hairy cell leukemia, head and neck cancer, heart cancer, hematopoetic tumors of the lymphoid lineage, hepatocellular cancer, Hodgkin lymphoma, hypopharyngeal cancer, hypothalamic and visual pathway glioma, IDs-related lymphoma, intraocular melanoma, islet cell tumors, Kaposi sarcoma, kidney cancer, Langerhans cell histiocytosis, laryngeal cancer, leukemia, lip and oral cavity cancer, male breast cancer, malignant fibrous histiocytoma, malignant germ cell tumors, malignant mesothelioma, medulloblastoma, melanoma, Merkel cell carcinoma, mesothelioma, mouth cancer, multiple endocrine neoplasia syndrome, multiple myeloma, mycosis fungoides, myelodysplastic, myeloproliferative neoplasms, nasal cavity and paranasal sinus cancer, nasopharyngeal cancer, neuroblastoma, non-Hodgkin lymphoma, non-small cell lung cancer, oral cancer, oropharyngeal cancer, osteosarcoma, ovarian cancer, ovarian epithelial cancer, ovarian germ cell tumor, ovarian low malignant potential tumor, pancreatic cancer, pancreatic neuroendocrine tumors (islet cell tumors), papillomatosis, paraganglioma, paranasal sinus and nasal cavity cancer, parathyroid cancer,

penile cancer, pharyngeal cancer, pheochromocytoma, pineal parenchymal tumors, pineoblastoma and supratentorial primitive neuroectodermal tumors, pituitary tumor, plasma cell neoplasm/multiple myeloma, pleuropulmonary blastoma, pregnancy and breast cancer, primary central nervous system lymphoma, primary liver cancer, primary metastatic squamous neck cancer with occult, prostate cancer, rectal cancer, renal cell cancer, renal pelvis and ureter, respiratory tract carcinoma, retinoblastoma, rhabdomyosarcoma, salivary gland cancer, sarcoma, Sézary syndrome, skin cancer, skin cancer, small intestine cancer, soft tissue sarcoma, squamous cell carcinoma (nonmelanoma), stomach cancer, supratentorial primitive neuroectodermal tumors, T-cell lymphoma, testicular cancer, throat cancer, thymoma and thymic carcinoma, thyroid cancer, transitional cell cancer, urethral cancer, uterine sarcoma, vaginal cancer, visual pathway and hypothalamic glioma, vulvar cancer, Waldenström macroglobulinemia, Wilms tumor, and systemic and central metastases of any of the foregoing.

[1118] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to be effective in treating cancer in a patient, such as the same cancer being treated with the compound comprising an IL-2Rα ligand.

[1119] A compound comprising an IL-2Rα ligand or a pharmaceutical composition thereof may be administered in conjunction with a chemotherapeutic agent, such as, for example, *N*-acetyl cysteine (NAC), adriamycin, alemtuzumab, amifostine, arsenic trioxide, ascorbic acid, bendamustine, bevacizumab, bortezomib, busulfan, buthionine sulfoxime, carfilzomib, carmustine, clofarabine, cyclophosphamide, cyclosporine, cytarabine, dasatinib, datinomycin, defibrotide, dexamethasone, docetaxel, doxorubicin, etoposide, filgrastim, floxuridine, fludarabine, gemcitabine, interferon alpha, ipilimumab, lenalidomide, leucovorin, melphalan, mycofenolate mofetil, paclitaxel, palifermin, panobinostat, pegfilrastim, prednisolone, prednisone, revlimid, rituximab, sirolimus, sodium 2-mercaptoethane sulfonate (MESNA), sodium thiosulfate, tacrolimus, temozolomide, thalidomide, thioguanine, thiotepa, topotecan, velcade, or a combination of any of the foregoing.

[1120] A compound comprising an IL-2Rα ligand and/or pharmaceutical composition thereof can be used in combination therapy with other chemotherapeutic agents including one or more antimetabolites such as folic acid analogs; pyrimidine analogs such as fluorouracil, floxuridine, and cytosine arabinoside; purine analogs such as mercaptopurine, thiogunaine, and pentostatin; natural products such as vinblastine, vincristine, etoposide, tertiposide, dactinomycin, daunorubicin, doxurubicin, bleomycin, mithamycin, mitomycin C, L-asparaginase, and interferon alpha; platinum coordination complexes such as cis-platinum, and carboplatin; mitoxantrone; hydroxyurea; procarbazine; hormones and antagonists such as prednisone, hydroxyprogesterone caproate, medroxyprogesterone acetate, megestrol acetate, diethylstilbestrol, ethinyl estradiol, tamoxifen, testosterone propionate, fluoxymesterone, flutamide, and leuprolide, anti-angiogenesis agents or

inhibitors such as angiostatin, retinoic acids, paclitaxel, estradiol derivatives, and thiazolopyrimidine derivatives; apoptosis prevention agents; triptolide; colchicine; luliconazole; and radiation therapy.

[1121] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising compound comprising an IL-2Rα ligand may be administered in conjunction with one or more chemotherapeutic agents, such as, for example, abarelix, abiraterone, abiraterone acetate, *n*-acetyl cysteine, aclarubicin hydrochloride, adriamycin, adenine, afatinib, afatinib dimaleate, alemtuzumab, alendronate sodium, alitretinoin, allopurinol sodium, altretamine, amifostine, aminoglutethimide, aminolevulinic acid, amrubicin, amsacrine, anastrozole, angiostatin, apremilast, aprepitant, arsenic trioxide, ascorbic acid, l-asparaginase, azacitidine, azathioprine sodium, bazedoxifene (serm), belinostat, bendamustine hcl, o6-benzylguanine (o6-bg), bevacizumab, bexarotene, bicalutamide, biricodar, bleomycin sulfate, bortezomib, bosutinib, brivudine, buserelin, busulfan, buthionine sulfoxime, cabazitaxel, cabozantinib, capecitabine, carboplatin, carboquone, carfilzomib, carmofur, carmustine, ceritinib, chlorambucil, cisplatin, cladribine, clodronate disodium, clofarabine, crizotinib, cyclophosphamide, cyclosporine, cytarabine, cytosine arabinoside, dabrafenib, dacarbazine, dactinomycin, dasatinib, datinomycin, daunorubicin, decitabine, defribrotide, degarelix acetate, dexamethasone, dexrazoxane hydrochloride, diaziquone, diethyl stilbestrol, docetaxel, doxifluridine, doxorubicin hydrochloride, doxorubicin free base, dromostanolone propionate, dutasteride, eltrombopag, enzalutamide, epirubicin hydrochloride, eribulin mesylate, erlotinib hydrochloride, estramustine phosphate sodium, ethinyl estradiol, etoposide phosphate, etoposide, everolimus, exemestane, fentanyl, filgrastim, fingolimod, floxuridine, fludarabine phosphate, fluorouracil, fluoxymesterone, flutamide, formestane, formylmelphalan, fosaprepitant, fotemustine, fulvestrant, gefitinib, gemcitabine hydrochloride, gemcitabine free base, glutathione, glyciphosphoramide, glyfosfin, goserelin acetate, granisetron hydrochloride, heptaplatin, hexyl 5-aminolevulinate, histrelin acetate, hydroxyprogesterone caproate, hydroxyurea, ibandronate sodium, ibrutinib, icotinib, idarubicin HCl, idelalisib, idoxuridine, ifosfamide, interferon alpha, imatinib mesylate, imiquimod, ingenol mebutate, ipilimumab, irinotecan hydrochloride, ixabepilone, lanreotide acetate, lapatinib free base, lapatinib ditosylate, lasofoxifene, lenalidomide, letrozole, leucovorin calcium, leuprolide acetate, levamisole hydrochloride, levoleucovorin calcium, iobenguane, lobaplatin, lomustine, maropitant, masoprocol, mechlorethamine hydrochloride, megestrol acetate, medroxyprogesterone acetate, melphalan hydrochloride, mercaptopurine, mercaptoethane sulfonate sodium, methotrexate, methoxsalen, methyl aminolevulinate, methylene blue, methylisoindigotin, mifamurtide, miltefosine, miriplatin, mithamycin, mitobronitol, mitomycin C, mitotane, mitoxantrone hydrochloride, mycophenolate mofetil, nabiximols, nafarelin, nandrolone, nedaplatin, nelarabine, netupitant, nilotinib, nilutamide, nimustine, nintedanib, nocodazole, octreotide, olaparib, omacetaxine mepesuccinate, ondansetron hydrochloride, oxaliplatin, paclitaxel, palbociclib, palifermin, palonosetron hydrochloride, pamidronate disodium, panobinostat, pasireotide, pazopanib hydrochloride, pegfilrastim, pemetrexed disodium, pentostatin, peplomycin, pipobroman, pirarubicin,

plerixafor, plicamycin, pomalidomide, ponatinib, porfimer sodium, porfiromycin, pralatrexate, prednimustine, prednisolone, prednisone, procarbazine hydrochloride, quinagolide hydrochloride, raloxifene, raltitrexed, radotinib, ranimustine, retinoic acids, revlimide, rituxinab, romidepsin, ruxolitinib, ruxolitinib phosphate, semustine, sirolimus, sodium thiosulfate, sorafenib free base, sorafenib tosylate, streptozocin, sufentanil, sunitinib, tacrolimus, talaporfin sodium, tamibarotene, tamoxifen citrate, tapentadol, temoporfin, temozolomide, temsirolimus, teniposide, teriflunomide, tertiposide, testolactone, testosterone propionate, thalidomide, thioguanine, thiotepa, thymalfasin, toceranib phosphate, topotecan hydrochloride, toremifene citrate, trabectedin, trametinib, tretinoin, trilostane, triptorelin, tropisetron, uramustine, valrubicin, vandetanib, vedotin, vemurafenib, verteporfin, vinblastine, vincristine sulfate, vincristine free base, vindesine, vinorelbine tartrate, vorinostat, and zoledronic acid.

[1122] Compounds provided by the present disclosure can be useful in treating autoimmune diseases. Autoimmune diseases are defined as human diseases in which the immune system attacks its own proteins, cells, and tissues. A comprehensive listing and review of autoimmune diseases can be found, for example, in *The Autoimmune Diseases* (Rose and Mackay, 2014, Academic Press).

[1123] Examples of autoimmune diseases include Addison's disease, agammaglobulinemia, alopecia areata, amyloidosis, ankylosing spondylitis, anti-GBM/anti-TBN nephritis, antiphospholipid syndrome, autoimmune angioedema, autoimmune dysautonomia, autoimmune encephalomyelitis, autoimmune hepatitis, autoimmune inner ear disease, autoimmune myocarditis, autoimmune pancreatitis, autoimmune retinopathy, autoimmune urticaria, axonal and neuronal neuropathy, Balo disease, Bechet's disease, benign mucosal pemphigoid, bullous pemphigoid, Castleman disease, celiac disease, Chagas disease, chronic inflammatory demyelinating polyneuropathy, chronic recurrent multifocal osteomyelitis, Churg-Strauss, cicatricial pemphigoid, Cogan's syndrome, cold agglutinin disease, congenital heart block, Coxsackie myocarditts, CREST syndrome, Crohn's disease, dermatitis herpetiformis, dermatomyositis, Devic's disease, discoid lupus, Dressler's syndrome, endometriosis, eosinophilic esophagitis, eosinophilic fasciitis, erythema nodosum, essential mixed cryoglobulinemia, Evans syndrome, fibromyalgia, fibrosing alveolitis, giant cell arteritis, giant cell myocarditis, glomerulonephritis, Goodpasture's syndrome, granulomatosis with polyangiitis, Graves' disease, Guillain-Barre syndrome, Hashimoto thyroiditis, hemolytic anemia, Henoch-Schonlein purpura, herpes gestationis or pemphigoid gestationis, hypogammaglobulinemia, IgA nephropathy, IgG4-related sclerosing disease, immune thrombocytopenic purpura, inclusion body myositis, interstitial cystitis, juvenile arthritis, juvenile diabetes, juvenile myositis, Kawasaki disease, Lambert-Eaton syndrome, leukocytoclastic vasculitis, lichen planus, lichen sclerosis, ligneous conjunctivitis, linear IgA disease, lupus, Lyme disease chronic, Meniere's diseases, microscopic polyangiitis, mixed connective tissue disease, Mooren's ulcer, Mucha-Habermann disease, multiple sclerosis, myasthenia gravis, myositis, narcolepsy, neuromyelitis, optica, neutropenia, ocular cicatricial pemphigoid, optic neuritis, palindromic rheumatism, PANDAS, paraneoplastic cerebellar degeneration, paroxysmal

nocturnal hemoglobinuria, Parry Romberg syndrome, pars planitis, Parsonage-Turner syndrome, pemphigus, peripheral neuropathy, perivenous encephalomyelitis, pernicious anemia, POEMS syndrome, polyarteritis nodosa, polyglandular syndromes, polymyalgia rheumatica, polymyositis, postmyocardial infarction syndrome, postpericardiotomy syndrome, primary biliary cirrhosis, primary sclerosing cholangitis, progesterone dermatitis, psoriasis, psoriatic arthritis, pure red cell aplasia, pyoderma gangrenosum, Raynaud's phenomenon, reactive arthritis, reflex sympathetic dystrophy, relapsing polychondritis, restless legs syndrome, retroperitoneal fibrosis, rheumatic fever, rheumatoid arthritis, sarcoidosis, Schmidt syndrome, scleritis, scleroderma, Sjogren's syndrome, sperm and testicular autoimmunity, stiff person syndrome, subacute bacterial endocarditis, Susac's syndrome, sympathetic ophthalmia, Takayasu's arteritis, temporal arteritis, thrombocytopenic purpura, Tolosa-Hunt syndrome, transverse myelitis, Type 1 diabetes, ulcerative colitis, undifferentiated connective tissue disease, uveitis, vasculitis, vitiligo, and Wegener's granulomatosis.

[1124] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to be effective in treating an autoimmune disease in a patient.

[1125] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an IL-15 agonist for treating an autoimmune disease. For example, a suitable IL-15 agonist is disclosed in PCT International Publication No. WO 2017/062832 A1 and in PCT International Publication No. WO 2015/153753 A1.

[1126] Compounds comprising an IL-2Rα ligand provided by the present disclosure and pharmaceutical compositions thereof may be administered to a patient to treat a disease associated with the activation, proliferation, metabolism, and/or differentiation of T-cells.

[1127] Compounds comprising an IL-2Rα ligand provided by the present disclosure and pharmaceutical compositions thereof may be administered to a patient to treat an organ transplant.

[1128] Compounds comprising an IL-2Rα ligand provided by the present disclosure and pharmaceutical compositions thereof may be administered to treat an inflammatory disease.

[1129] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with cell proliferation.

[1130] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with metabolism. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with mitochondrial metabolism. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to

be an anti-metabolite. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere RNA transcription. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with RNA translation. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with protein synthesis. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with synthesis of precursors for DNA synthesis and replication. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with purine synthesis. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with nucleoside synthesis. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interact with mTOR. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interact be an mTOR inhibitor. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with cell cycle checkpoints.

[1131] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with a checkpoint inhibitor including CTLA-4 inhibitors such as ipilimumab, PD1 inhibitors such as pembrolizumab and cemiplimab, and PD-LI inhibitors such as atezolizumab, avelumab, and durvalumab. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an immunomodulator such as CD137/4-1BB, CD27, GIYR, and/or OC40.

[1132] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to be cytotoxic. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to be cytostatic. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to cause DNA damage. A compound

comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to cause cell cycle arrest. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to cause mitotic catastrophe.

[1133] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to modulate drug resistance. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to reduce multi-drug resistance. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interact with membrane proteins. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interact with plasma membrane proteins. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interact with nuclear membrane proteins. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interact with major vault protein or proteins. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interact with gen products of the MVP (major vault protein) gene.

[1134] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to modulate glutathione concentration. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to modulate glutathione concentration within cells. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to decrease glutathione concentration within cells. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to reduce glutathione uptake into cells. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to reduce glutathione synthesis. A compound comprising an IL-2Rα ligand or a pharmaceutical

composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to reduce glutathione synthesis within cells.

[1135] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with neovascularization. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to reduce neovascularization. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to promote neovascularization.

[1136] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with hormone homeostasis. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with hormone synthesis. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with hormone receptor binding. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with hormone signal transduction.

[1137] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with growth factor homeostasis. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with growth factor synthesis. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with growth factor receptor expression. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with growth factor binding to growth factor receptors. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with growth factors binding to growth factor receptors. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with growth factor receptor signal transduction. A compound comprising an IL-

2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to interfere with the Hedgehog (Hh) signaling. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand can be administered in conjunction with an agent known or believed to inhibit the Hedgehog pathway signaling. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to inhibit ALK (anaplastic lymphoma kinase) pathway signaling. A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with an agent known or believed to inhibit non-homologous end joining (NHEJ) is a pathway.

[1138] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a compound comprising an IL-2Rα ligand may be administered in conjunction with one or more agents known or believed to be a VEGFR (vascular endothelial growth factor receptor) inhibitor, a RTK (receptor tyrosine kinase) inhibitor, a sodium channel current blocker, aFAK (focal adhesion kinase) inhibitor, a GLI (glioma-associated oncogene) inhibitor, a GLI1 inhibitor, a GLI2 inhibitor, a GLI3 inhibitor, a MAPK (mitogen-activated protein kinase) inhibitor, a MAPK/ERK pathway (also known as Ras-Raf-MEK-ERK pathways) inhibitor, a MEK1 inhibitor, a MEK2 inhibitor, a MEK5 inhibitor, a MEK5/ERK5 inhibitor, aRTA (renal tubular acidosis) inhibitor, a ALK (anaplastic lymphoma kinase) inhibitor, Aa LK kinase inhibitor, a nuclear translocation inhibitor, a PORCN (porcupine) inhibitor, a 5-ARI (5α-reductase inhibitor), topoisomerase inhibitor, a Ras (rat sarcoma) inhibitor, a K-ras inhibitor, a CERK (ceramide kinase) inhibitor, a PKB (protein kinase B, also known as AKT) inhibitor, a AKT1 inhibitor, EZH2 (enhacer of zeste homolog 2) inhibitor, a BET (bromodomain and extraterminal domain motif) inhibitor, a SYK (apleen tyrosine kinase) inhibitor, JAK (janus kinase) inhibitors, a SYK/JAK inhibitor, a IDO (indoleamine-pyrrole 2,3-dioxygenase) inhibitor, a IDO1 inhibitor, a RXR (retinoic X receptors) activating agent, a selectively RXR activating agent, a p-glycoprotein inhibitor, a ERK inhibitor, a PI3K (phosphatidylinositol-4,5-bisphosphate 3-kinase) inhibitor, a BRD (bromodomain-containing protein) inhibitor, a BRD2 inhibitor, a BRD3 inhibitor, a BRD4 inhibitor, a BRDT (bromodomain testis-specific protein) inhibitor, a reverse transcriptase inhibitor, a NRT (nucleoside analog reverse-transcriptase) inhibitor, a PIM (proviral integrations of moloney virus) inhibitor, a EGFR (epidermal growth factor receptor) inhibitor, a photosensitizer, a radiosensitizer, a ROS (proto-oncogene, recptor tyrosine kinase) inhibitor, a ROS1 (proto-oncogene 1) inhibitor, a CK (caseine kinase) inhibitor, a CK2 inhibitor, a Bcr-Abl (breakpoint cluster region – Abelson proto-oncogene) tyrosine-kinase inhibitor such as dasatinib, a microtubule stabilizing agent, a microtubule depolymerisation/disassembly inhibitor, a DNA intercalator, an androgen receptor antagonist, a chemoprotective agents, a HDAC (histone deacetylase) inhibitor, a DPP (dipeptidyl pepdidase) inhibitor, a DPP-4 inhibitor, BTK (Bruton's tyrosine kinase) inhibitor, a kinase inhibitor

such as imatinib, a tyrosine kinase inhibitor such as nilotinib, a ARP (poly (ADP-ribose) polymerase) inhibitor, a CDK (cyclin-dependent kinase) inhibitor, a CDK4 inhibitor, a CDK6 inhibitor, a CDK4/6 inhibitor, a HIF1α (hypoxia-inducible factor 1- α) inhibitor, a DNA ligase inhibitor, a DNA ligase IV inhibitor, a NHEJ (non-homologous end joining) inhibitor, a DNA ligase IV, a NHEJ inhibitor and a RAF inhibitor, a TKI and a RAF inhibitor, a TKI and RAF inhibitor such as sorafenib, a PDT (photodynamic therapy) sensitizer, an ATR (ataxia telangiectasia- and Rad3-related protein kinase) inhibitor, or a combination of any of the foregoing.

[1139] A compound comprising an IL-2Rα ligand or a pharmaceutical composition comprising a IL-2Rα ligand may be administered in conjunction with one or more chemotherapeutic agents, such as, for example, a VEGFR inhibitor such as fruquintinib, motesanib/AMG-706, vatalanib; a RTK inhibitor such as ponatinib; a sodium channel blocker such as GS967; a FAK inhibitor such as TAE226; a GLI1 and GLI2 inhibitor such as GANT61, a MEK inhibitor such as binimetinib; a RTA inhibitor such as linifanib; an ALK inhibitor such as brigstinib; bromopyruvic acid; a DNA alkylating agent such as thiotepa; nuclear translocations factors such as JSH-23; a PORCn inhibitor such as Wnt-C59; a 5α-reductase inhibitor such as dutasteride; a topoisomerase inhibitor such as carubicin; a RAS inhibitor such as Kobe0065; a CerK inhibitor such as NVP-231; an AKT inhibitor such as uprosertib; a EZH2 inhibitor such as GSK-503; a BET bromodomain inhibitor such as OTX015; a MEK5/ERK5 inhibitor such as BIX02189; a Syl/JAK inhibitor such as cerdulatinib; an IDO1 inhibitor such as NLG919; a retinoic X receptor activating agent such as bexsrotene; a PGP inhibitor such as acotiamide or actotiamide HCl; an Erk inhibitor such SCH772984; a PI3K inhibitor such as gedatolisib; a JAK inhibitor such as ruxolitinib; an AKT inhibitor such as afuresertib or afuresertib HCl;an ALK1 inhibitor such as ceritinib; an HDAC inhibitor such as abexinostat; a DPP inhibitor such as oamarigliptin; an EGFR inhibitor such as gefittinib; an EZH2 inhibitor such as GSK126; a BTK inhibitor such as ibrutinib; a kinase inhibitor such as imatinin HCl; an IDO inhibitor such as INCB024360; a DNA crosslinker such as mitomycin C; a tyrosine kinase inhibitor such as nilotinib, a PARP inhibitor such as olaparib; a tubulin stabilization promoter such as paclitaxel; a CDK4/6 inhibitor such as palbociclib; a RTK inhibitor such as sunitinib; a PDT sensitizer such as tslsporfin; a p-glycoprotein inhibitor such as tariquidar; an ATR inhibitor such as VE-822 ; an HDAC inhibitor such as PCI-24781; a DPP inhibitor such as omarigliptin; an EGFR inhibitor such as gefinib; an EZH2 inhibitor such as GSK126; a BTK inhibitor such as irbrutinib; an IDO inhibitor such as INCB024360; or a combination of any of the foregoing.

[1140] An IL-2Rα binding compound provided by the present disclosure can be used as a vaccine adjuvant.

[1141] IL-2Rα binding compounds provided by the present disclosure can be useful when combined with certain vaccines, including cancer neo-antigen vaccines. Mutations in tumor DNA produce new protein sequences that are foreign to the body. Vaccines can be designed to specifically activate a patient's immune system with respect to tumor-specific neoantigens. When administered in

combination with a neo-antigen vaccine, IL-2Rα binding compounds provided by the present disclosure can expand and proliferate neo-antigen-specific T-cells in the tumor microenvironment and thereby drive maximal expansion of vaccine-induced neoantigen-specific T-cells for the treatment of cancer.

[1142] IL-2Rα ligands and IL-2Rα constructs provided by the present disclosure can be used as adjuvants. An adjuvant refers to a compound that enhances the efficacy of a vaccine without directly participating in the protective immunity. For example, an IL-2Rα binding compound provided by the present disclosure can be used in conjunction with a cancer vaccine.

[1143] IL-2Rα ligands and IL-2Rα ligand constructs provided by the present disclosure can be useful for cell therapy when engineered to be expressed on the membrane surface of cells that also express the IL-2Rα subunit. Adoptive immunotherapy using NK cells or using re-targeted chimeric antigen receptor (CAR) T-cells is currently being studied as a treatment for neoplasms and viral infections. One challenge with these cell therapies is the suboptimal sustained survival of the infused cells.

[1144] DNA encoding an IL-2Rα binding compound fused to a membrane protein in such a way that the IL-2Rα binding compound is expressed on the extracellular surface of a cell can be constructed using standard techniques. When the fusion protein comprising the IL-2Rα binding compound is expressed, IL-7 receptors on the cell can become activated leading to long-term persistence of the cell.

[1145] DNA encoding an IL-2Rα binding compound can be incorporated into a cell and can be configured to produce an IL-2Rα binding compound provided by the present disclosure. The IL-2Rα binding compound can be secreted from the cell and can interact with the secreting cells (*i.e.*, autocrine signaling) and/or cells in the vicinity of the secreting cell (i.e., paracrine signaling). A secreted IL-2Rα binding compound provided by the present disclosure can be an IL-2R agonist and can be designed to localize near the secreting cell.

[1146] An IL-2Rα binding compound provided by the present disclosure can be used to expand non-regulatory T-cells within a patient or within a biological sample. Methods of increasing the ratio of non-regulatory T-cells to Treg cells can comprise contacting a population of T-cells with an effective amount of an IL-2Rα binding compound. The ratio can be measured by determining the ratio of CD3+FOXP3+ cells to CD3+FOXP3-cells within the population of T-cells. A typical Treg frequency in human blood is 5% to 10% of the total CD4+CD3+ T-cells, however, in certain diseases this percentage may be lower or higher.

[1147] An IL-2Rα binding compound can be used to expand NK cells. NK cells modified with chimeric antigen receptors (CARs), which redirect immune cell activity to target cancer cells have been demonstrated to exhibit improved antitumor responses. CARs can comprise an antibody-derived extracellular domain, which binds to the desired tumor-associated antigen (TAA) and triggers an intracellular signaling cascade to activate the immune cell against the target cells.

[1148] NK cells can be genetically engineered for enhanced expression of one or more tumor targeting receptors such as NKG2D with membrane-bound IL-2Rα binding compound, which can prolong the persistence and potency of the NK cells.

[1149] CAR T-cells can be genetically engineered to co-express a tethered form of an IL-2Rα binding compound provided by the present disclosure to support *in vivo* persistence and maintenance of an immature state of differentiation and to exhibit in vivo antitumor activity.

[1150] IL-2Rα binding compounds provided by the present disclosure can also be utilized as commercial reagents for various medical research and diagnostic uses. Such uses include, for example, (1) use as a calibration standard for quantitating the activities of candidate IL-2R agonists in a variety of functional assays; (2) use to maintain the proliferation and growth of IL-7-dependent cell lines; (3) use in structural analysis of IL-2R through co-crystallization; (4) use to investigate the mechanism of IL-2R signal transduction/receptor activation; and (5) other research and diagnostic applications where IL-2R is activated or such activation is conveniently calibrated against a known quantity of an IL-2R agonist.

[1151] Aspects of the present invention include nucleic acids encoding for an IL-2Rα binding compound provided by the present disclosure.

[1152] A nucleic acid or isolated polynucleotide encoding an IL-2Rα provided by the present disclosure can be incorporated into expression vectors depending in part on the host cells used to produce the IL-2Rα binding compound. Generally, the nucleic acids can be operably linked to any number of regulatory elements such as, for example, promoters, origin of replication, selectable markers, ribosomal binding sites, and/or inducers. The expression vectors can be extra-chromosomal or integrating vectors.

[1153] The nucleic acids and/or expression can be transformed into any number of different types of host cells including mammalian, bacterial, yeast, insect and/or fungal cells, with mammalian cells such as CHO cells.

[1154] A nucleic acid encoding an IL-2Rα binding compound can comprise a first nucleic acid sequence encoding an IL-2Rα ligand; a second nucleic acid sequence encoding a peptidyl ligand linker; and a third nucleic acid sequence encoding an IL-2Rα ligand, an Rγc ligand, and/or a construct partner.

[1155] A nucleic acid encoding an IL-2Rα ligand fusion protein can comprise a first nucleic acid sequence encoding the IL-2Rα ligand provided by the present disclosure; and a second nucleic acid sequence encoding a fusion partner. A nucleic acid encoding an IL-2Rα ligand fusion protein can comprise a nucleic acid encoding an IL-2Rα ligand and the fusion partner. A nucleic acid encoding an IL-2Rα ligand fusion protein can further comprise a nucleic acid segment encoding a construct linker and a nucleic acid encoding an IL-2Rα ligand fusion protein can comprise a nucleic acid encoding an IL-2Rα ligand, the fusion partner, and the construct linker.

[1156] The fusion partner can comprise, for example, HSA, an Fc-fragment, an IgG, an antibody directed to a cell-specific antigen, and an antibody directed to a cell-specific receptor.

[1157] A nucleic acid encoding an IL-2Rα fusion protein can further comprise a nucleic acid encoding a peptidyl linker, where the peptidyl linker is configured to bind the IL-2Rα ligand to the fusion partner.

[1158] A nucleic acid provided by the present disclosure can encode a fusion protein comprising an IL-2Rα ligand, and a linker binding the C-terminus of the IL-2Rα ligand to HSA.

[1159] A nucleic acid provided by the present disclosure can encode a fusion protein comprising a dimeric Fc-Fragment of IgG1, IgG2, or IgG4, an IL-2Rα ligand, and a linker binding the N-terminus of an IL-2Rα ligand to the C-terminus of one CH3 domain of the dimeric Fc-fragment.

[1160] A nucleic acid provided by the present disclosure can encode a fusion protein comprising a dimeric Fc-Fragment of IgG1, IgG2, or IgG4, two IL-2Rα ligands, and a linker binding the N-terminus of each of the two IL-2Rα ligands to the C-terminus of each CH3 domain of the dimeric Fc-fragment.

[1161] A nucleic acid provided by the present disclosure can encode a fusion protein comprising a heavy chain of an immunoglobulin molecule such as IgG1, IgG2, or IgG4, an IL-2Rα ligand, and a Fc linker bonding the N-terminus of the IL-2Rα ligand to the C-terminus of the Fc region.

[1162] A nucleic acid provided by the present disclosure can encode for an IL-2Rα ligand comprising an amino acid sequence of any one of SEQ ID NOS: 1-307 and 400-422, or can encode for an amino acid sequence comprising an amino acid sequence having greater than 60%, greater than 70%, greater than 80%, greater than 85%, greater than 90%, or greater than 95% sequence similarity to any one of SEQ ID NOS: 1-307 and 400-422.

[1163] A nucleic acid provided by the present disclosure can encode for a homomeric IL-2Rα ligand comprising two or more IL-2Rα ligands provided by the present disclosure.

[1164] Aspects of the invention further include a host cell comprising an expression vector comprising a nucleic acid encoding an IL-2Rα ligand or an IL-2Rα binding compound provided by the present disclosure.

[1165] Methods provided by the present disclosure include methods of making an IL-2Rα ligand or an IL-2Rα binding compound provided by the present disclosure, comprising culturing a host cell, wherein the host cell comprises an expression vector comprising a nucleic acid encoding an IL-2Rα ligand or an IL-2Rα binding compound provided by the present disclosure, under conditions where the IL-2Rα ligand or the IL-2Rα binding compound is expressed, and recovering the expressed IL-2Rα ligand or IL-2Rα binding compound.

EXAMPLES

[1166] The following examples describe in detail methods used for determining the activity of peptides comprising the IL-2Rα subunit. It will be apparent to those skilled in the art that many

modifications, both to materials and methods, may be practiced without departing from the scope of the disclosure.

Example 1

Phage Display pIII Library Panning against Fc-Fusions on Magnetic Beads (Acid Elution)

Library Panning Procedure

[1167] Fifty (50) µL of Protein G Dynabeads® (Invitrogen) was used for each library sample. After resuspending the stock bottle, the desired volume of beads was transferred to a sterile microfuge tube and applied to the magnet.

[1168] With the beads on a magnet, the supernatant was removed, and the beads were washed with 1 mL of PT buffer (1×PBS, 0.05% Tween®-20).

[1169] The supernatant was removed and 1 mL of PBS + 1% BSA + 0.05% Tween®-20 was added and mixed at 2 5°C for at least 1 hour to block the beads.

[1170] A tube was applied to the magnet and the blocking solution was removed. For each library to be tested, 5 µg of a Fc-fused receptor of interest was added to each library sample for each round to bring the total volume to at least 400 µL. The samples were mixed at 25 °C for at least 1 h. The sample was applied to the magnet and the supernatant was removed.

[1171] Two-hundred 200 µL of PT buffer was added for each 50 µL of bead. The sample was thoroughly mixed and 200 µL aliquots were transferred into tubes that were pre-labeled for each library to be screened. An additional 500 µL of PT was added to each tube, the samples mixed, and then applied to the magnet. A total of 700 µL /tube was used for the wash.

[1172] The wash was removed and 500 µL of 250 nM Fc blocking peptide diluted in PBT (PBS + 0.5% BSA + 0.05% Tween®-20) was added to each sample. The stock concentration was 25 µM (100×). The samples were incubated at 4 °C for at least 30 min while rotating. Following the incubation, the samples were applied to the magnet and the blocking peptide solution was removed prior to adding the libraries. One (1) mL aliquots of the libraries removed from the -20 °C freezer. One-hundred (100 µL of 10×BT buffer (5% BSA, 0.5% Tween®-20 in 1×PBS) was added to each tube and vortexed. Eleven (11) µL of Fc blocking peptide was added to each library sample and vortexed. The library samples were transferred to pre-labeled tubes containing beads. The samples were then incubated at 4 °C on the rotator for at least 2 h. For the additional rounds of screening, 1 mL aliquots of the amplification from the previous round from each library was used. Fc blocking peptide was then added at the concentration indicated in step 6 (10 µL blocking peptide).

[1173] The beads were recovered with the magnet and the phage solution removed. The beads were washed 2× with 1 mL of PT buffer. Five-hundred (500) µL of PT buffer was added and the suspension was transferred to a clean tube. The beads were recovered on the magnet and the final wash removed.

[1174] Four-hundred seventy-five (475) µL of phage elution buffer was added to each well (0.2 M glycine-HCL, pH 2.2, 1 mg/mL BSA). The samples were incubated at 25°C for 10 min on the rotator. The beads were recovered on the magnet and the eluted phage transferred to a clean tube.

[1175] Twenty-five (25) µL of neutralization buffer (2M Tris Base) was added to the 475 µL of elution. The neutralized samples were maintained at 4 °C until the TG1 cells were ready amplification. The samples were stored at -20 °C after screening. Fifty (50) µL (about 10% of the total volume) was transferred to a 1.5 mL microfuge tube and store at -20°C for use in deep sequencing.

Example 2

TG1 Culture and Library Amplification

[1176] A fresh TG1 (or OmniMax) culture was grown for about 1 to 1.5 h after adding the libraries to the beads. 2X-YT medium (10 mL) was placed into a 50 mL Falcon® tube. Two-hundred (200) µL of the TG1 overnight was added to the falcon tube. 2X-YT medium (600 µL) was placed in a cuvette for OD600 blank. The culture was grown at 250 rpm and 37 °C, taking the first OD measurement after 60 min. The TG1 cells should be in log phase at the time of use with an OD600 of 0.5-0.7.

[1177] Eluted phage (400 µL to 450 µL) was added to 1 mL of the TG1 cells at an OD600 of 0.5-0.7 in a 50 mL Falcon® tube. The phage and TG1 cells were incubated at 37 °C for 30 min without shaking. About 50 µL to 100 µL was set aside for titering and characterization.

[1178] 2YT medium (10.5 mL) was added to 12 µL of carbenicillin (carb) (100 mg/mL to make 100 µg/mL) and 24 µL of 50% glucose (to make 0.1% glucose) and the cells incubated while shaking at 37 °C at 250 rpm for 1 h.

[1179] M13K07 helper phage (5×10^{10} pfu, 24 µL of the stock, 2×10^{12} pfu/mL) was then added and swirled to mix. The phage and cells were incubated at 37 °C for 30 min without shaking.

[1180] Kanamycin was diluted to 3 mg/mL and arabinose to 2.4% in 2YT medium / Carbenicillin-100 / 0.1% glucose and 100 µL was added to each amplification. The mixture was incubated overnight at 37 °C and 250 rpm.

[1181] The culture was transferred to a 50 mL high-speed VWR centrifuge tube and centrifuged at 8,000 g for 15 min at 4 °C in a JSP-F50C centrifuge to pellet the cells.

[1182] The supernatant was transferred to a 50 mL high-speed VWR centrifuge tube and 0.2 volumes of PEG/NaCl (multiply the volume by 0.25 mL to 3 mL PEG/NaCl for 12 mL amplification) was added, mixed, and incubated on ice for 30 minutes.

[1183] The cells were then centrifuged at 10,500 g for 15 min at 4 °C in a JSP-F50C centrifuge. The supernatant was removed, and the phage pellet was resuspended in a total of 1 mL of PBT (1×PBS, 0.05% Tween® 20, 0.5% BSA) by pipetting.

[1184] The sample was transferred to an Eppendorf tube, vortexed, and centrifuged at 12,000 rpm for 30 sec. The supernatant was transferred to a clean Eppendorf tube and stored at 4 °C. This amplified phage sample (250-500 μL) was used for the next round of screening.

Example 3

Preparation of cultures from individual colonies

[1185] Ninety-six (96) wells of a deep well plate were filled with 1 mL of 2YT broth / Ampicillin-50 / 0.1% glucose. Ninety-six (96) colonies were placed into the wells using P20 tips. The tips were left in the wells to mark the position. The tips were removed using a multi-channel pipette after the entire plate was completed. The plate was covered with a breathable film.

[1186] The inoculated plate(s) were incubated in a shaker at 37 °C until the cultures became turbid, typically within 4 h at 250 rpm.

[1187] The plate(s) was removed from the Incubator and 50 μL of the culture from each well was removed to another deep well block designated as the "Archive Block" containing 1 mL of 2YT broth / Ampicillin-50/0.1% glucose. The plate(s) were covered with a breathable film and incubated overnight at 37 °C and 250 rpm.

[1188] After incubating overnight, M13K07 helper phage was added to 2×10^{10} pfu/mL in 2YT broth / Ampicillin-50 / 0.1% glucose (make 6.0 mL per block). Fifty (50) μL of the diluted M13K07 was added to each culture well in the deep well block. The deep well block was covered with breathable film and incubated for 30 min at 37 °C and 250 rpm.

[1189] Kanamycin was diluted to 0.5 mg/ml and arabinose to 0.4% in 2YT broth / Ampicillin-50/0.1% glucose (make 6.0 ml per block) and 50 μL was added to each well. The plate was covered with a breathable film and incubated overnight at 37 °C and 250 rpm.

[1190] The "Archive Block" culture was removed from the incubator and 50 μL was transferred to a 96-well plate containing 50 μL of 50% glycerol. The plate was sealed with foil and stored at -80 °C. The remaining culture in the block was covered with a foil seal and stored at 4 °C.

[1191] The block was centrifuged and inoculated with M13K07 at 4000 rpm for 15 min. While avoiding the bacterial pellet, 850 μL of the phage supernatant was transferred to a fresh deep well plate, covered with a foil seal, and stored at 4 °C.

Example 4

ELISA protocol for Fc-fusions:

[1192] For each block to be assayed, a 1×96 well ELISA plate was coated with Fc-fusion (1 μg/mL in PBS) at 50 μL/well. The wells were incubated at 25 °C for at least 1 h.

[1193] The Fc-fusion was removed from each well. Three-hundred (300) μL of blocking buffer (1×PBS, 1% BSA) was added to each well of a receptor-coated plate. Also, 300 μL of the blocking buffer was added to a separate uncoated 96-well ELISA plate to be used as the negative control. Both plates were covered with film and left at 37 °C for 1 h or overnight at 4 °C.

[1194] The plate was washed 4 times with PT (1×PBS, 0.05% Tween® 20) buffer.

[1195] Fifty (50) μL of PBT was added to each well. Fifty (50) μL of the phage supernatant from the block was added to each well and incubated at 4 °C for 1 h.

[1196] The plates were washed 4 times with cold PT.

[1197] To each well 100 μL of anti-M13-HRP antibody diluted 1:5000 in cold PBT was added. The wells were incubated for 1 h at 4 °C.

[1198] The plates were then washed 4 times with cold PT.

[1199] Fifty (50) μL of TMB was then added to each well, and the wells were incubated for 1-10 min at 25 °C. Fifty (50) μL of a "stop" solution was added and the plate read at 450 nm.

Example 5

Evaluation of peptide heteromer ability to activate IL-2 responsive cells

[1200] Following the identification of peptidyl ligands that exhibit IL-2Rα binding activity, compounds will be identified that exhibit IL-2R agonist, IL-2R antagonist activity, and/or IL-2R binding activity. This can involve assessing the ability of the peptide to polymerize the IL-2Rαβγc subunits and to signal in cell-based assays. Polymerization is a necessary, but not sufficient, step in the activation of IL-2 receptor signaling. To assess agonist activity in cell-based assays, IL-2 responsive cell lines will be tested for an indicator of IL-2 signaling, phosphorylation of STAT5. Compounds that exhibit IL-2R agonist activity in these cell lines will then be tested in primary human peripheral blood mononuclear cells (PBMC) for IL-2R agonism, and for the desired selectivity favoring activation of cell types expressing IL-2Rβγc subunits.

[1201] Polymerization potential will be assessed using a β-Gal complementation system in which a portion of the intracellular domains of each respective IL-2 receptor subunit is replaced with functionally complementary fragments of β-Gal, which regain catalytic activity when brought into sufficiently proximity. Cells expressing these constructs generate β-Gal activity, with an EC50 of about 26 nM, when treated with IL-2 (see DiscoverX product specifications). Candidate compounds will be scored for induction of STAT5 phosphorylation in two cell lines: (1) CTLL-2 cells, a mouse cytotoxic T-lymphocyte line that expresses all three IL-2 receptor subunits, and which are responsive to IL-2Rβγc-biased variants as well as wild type IL-2; and (2) TF-1β cells derived from the human erythroleukemia line TF-1, which naturally express only IL-2Rγc, and are engineered to be IL-2 responsive by transfection of IL-2Rβ. TF-1β will be constructed and IL-2R subunit expression levels in both cell lines will be verified by QPCR and FACS analysis.

[1202] Compounds will be tested in both cell lines. Dose response assays will be conducted to determine EC50 of the test compounds and to compare the test compounds with IL-2 as an indicator of IL-2Rβγc receptor bias. To further characterize subunit bias, a parallel assay will be run in the presence of a neutralizing antibody to the human IL-2Rβ subunit.

[1203] As a control to confirm that positive compounds are acting through stimulation of the IL-2 receptor, the assay will also be done with cells treated with neutralizing anti-huIL-2Rα antibody. To determine that compound activity is not due to contamination with cytokines, test compounds will be

treated with neutralizing antibodies (R&D Systems) against the natural IL-2Rβγc agonists, IL-2 and IL-15.

[1204] Compounds exhibiting IL-2R agonist activity in the cell lines will be tested on human primary immune cells, PBMCs, collected from individual donors (commercially available from Lonza and others), and in some cases on purified CD4+ CD8+ cells (Lonza). A substantial fraction of PBMCs from normal donors are responsive to IL-2. To assess IL-2 agonist activity of the test compounds, cells will be exposed to the compounds or IL-2 and scored for STAT5 phosphorylation by western blot analysis. As a control to confirm that positive compounds are acting through direct stimulation of the IL-2 receptor, the assay will also be done with cells treated with neutralizing anti-huRα antibody.

[1205] Those compounds exhibiting STAT5 activation of PBMCs will be subjected to a follow-on assay designed to assess subunit bias of the compounds compared to IL-2. This assay will involve determining a dose response of the test compounds and IL-2 (1 to 1000 IU) over 30 min, scored by a FACS-based protocol allowing detection of both intracellular pSTAT5 as an indicator of IL-2R activation, and cell surface CD25, the IL-2Rβ subunit. Cells expressing the three IL-2R subunits, IL-2Rαβγc, bind IL-2 with very high affinity (about 10 pM) and are therefore sensitive to low concentrations of IL-2; whereas cells expressing only IL-2Rβγc (about 1 nM affinity) require exposure to substantially higher IL-2 levels for activation. Because compounds provided by the present disclosure are selected for binding to the IL-2Rαthe potency of the compounds comprising an IL-2Rα ligand is expected to be correlated with the level of expression of IL-2Rα on cells; and comparison of response profiles of cells treated with compounds provided by the present disclosure or treated with IL-2 should reveal any bias.

Example 6

Identified Peptides

[1206] Stochastic libraries with each library containing approximately 10 billion independent recombinants, with each clone potentially displaying a unique peptide sequence have been screened for binding to the human IL-2Rα subunit. In screening these initial libraries against the IL-2Rα subunit extracellular domain (ECD), unique peptide clones were identified and confirmed as ligands of IL-2Rα. These IL-2Rα ligands can be grouped into sequence families that exhibit a clear consensus sequence.

Example 7

Chemical Synthesis of IL-2Rα.Ligands

[1207] 2-Cholorotrityl resin (1 g, 1.5 mmole/g, from Anaspec) was washed with DMF (2×), and then allowed to stand in 50 mL DMF for 10 min. The swollen resin was treated with an activated solution of Fmoc-glycine prepared from 5 eq. of amino acid and 5 eq. of HATU dissolved at 0.5M in DMF, followed by the addition of 10 eq. of DIEA, and the mixture gently stirred for 30 min at 25 °C. The resin was washed (DMF, THF, DCM, and MeOH) and dried to yield the Fmoc-protected resin. Fmoc

groups were then removed by gently shaking the resin with 30% piperidine in DMF for 20 min, followed by washing (DMF, THF, DCM, and MeOH), and drying. The resin was then subjected to repeated cycles of Fmoc-amino acid couplings with HATU activation and Fmoc removal with piperidine to build a desired amino acid sequence. Except for examples with four cysteine residues in the sequence, standard 95% TFA-labile amino acid side chain protecting groups were used. With compounds with four cysteines, the two cysteine residues proximal to the resin, Trt protection was used, and for the two cysteine residues distal to the resin, Acm protection was used. After Fmoc removal from the final amino acid of the dimer sequence, in some cases the terminal amine groups were acylated with acetic anhydride (10 eq.) and DIEA (20 eq.) in DMF for 20 min, followed by washing as described above.

[1208] The completed peptide was cleaved from the resin by suspension in a solution of TFA (95 vol%), water (2.5 vol%), and triisopropylsilane (2.5 vol%) for 3 h at 25 °C. The TFA solution was cooled to 5 °C and poured into Et_2O to precipitate the peptide. Filtration and drying under reduced pressure gave the desired peptide. Purification *via* preparative HPLC with a C18 column afforded the pure peptide with the two C-terminal thiol groups in a reduced state. This peptide was dissolved in 20% DMSO/water (1 mg dry weight peptide/mL) and allowed to stand at 25 °C for 36 h, and then purified by reverse phase HPLC to provide the peptide with the two C-terminal thiols linked by a disulfide bridge. In compounds containing four cysteines, the two N-terminal Acm-protected cysteine residues were then deprotected by dissolving 0.1 mmole of peptide in 25 mL of 50% acetic acid/H_2O and 2.5 mL of 1M HCl and adding 5 mL of 0.1M iodine (in glacial acetic acid; 5 eq.) dropwise with stirring under a nitrogen atmosphere. The deprotection/oxidation reaction was allowed to proceed for 2 h at 25 °C with frequent monitoring (analytical HPLC) to ensure complete reaction. The reaction was stopped by addition of ice-cooled diethyl ether (9 volume eq.). The resulting solution was cooled on dry ice (3 min), the ether solution carefully decanted, and the resulting light-yellow solid purified by preparative reverse phase HPLC (95%) to yield the final IL-2Rα ligand or peptide having an IL-2Rα ligand.

[1209] IL-2Rα ligands having SEQ ID NO: 400 to SEQ ID NO: 422 were synthesized.

ASPECTS OF THE INVENTION

[1210] The invention is further defined by the following aspects.

[1211] Aspect 1. An IL-2Rα ligand, wherein the IL-2Rα ligand binds to the human IL-2Rα subunit with an IC_{50} of less than 100 μM.

[1212] Aspect 2. The IL-2Rα ligand of aspect 1, wherein the IL-2Rα ligand comprises from 5 to 30 amino acids.

[1213] Aspect 3. The IL-2Rα ligand of any one of aspects 1 to 2, wherein the IL-2Rα ligand binds to the human IL-2Rα subunit with an IC_{50} from 1 pM to 100 μM.

[1214] Aspect 4. The IL-2Rα ligand of any one of aspects 1 to 2, wherein the IL-2Rα ligand binds to the human IL-2Rα subunit with an IC_{50} from 0.1 μM to 50 μM.

[1215] Aspect 5. The IL-2Rα ligand of any one of aspects 1 to 2, wherein the IL-2Rα ligand binds to the human IL-2Rα subunit with an IC_{50} of less than 100 μM.

[1216] Aspect 6. The IL-2Rα ligand of any one of aspects 1 to 2, wherein the IL-2Rα ligand binds to a mammalian IL-2Rα subunit with an IC_{50} of less than 100 μM.

[1217] Aspect 7. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (1) (SEQ ID NO: 1):

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (1)$$

wherein,

X^1 is selected from an amino acid comprising a large hydrophobic side chain or an aromatic side chain;

X^2 is selected from an amino acid comprising a large hydrophobic side chain;

X^3 is selected from an amino acid;

X^4 is selected from an amino acid comprising a large hydrophobic side chain;

X^5 is selected from an amino acid comprising a small hydrophobic side chain or a polar/neutral side chain;

X^6 is selected from an amino acid comprising a large hydrophobic side chain;

X^7 is selected from an amino acid comprising a large hydrophobic side chain;

X^8 is selected from an amino acid comprising a large hydrophobic side chain;

X^9 is selected from an amino acid comprising a small hydrophobic side chain;

X^{10} is selected from an amino acid comprising a polar/neutral side chain;

X^{11} is selected from an amino acid comprising a large hydrophobic side chain; and

X^{12} is selected from an amino acid comprising a large hydrophobic side chain.

[1218] Aspect 8. The IL-2Rα ligand of aspect 7, wherein X^1 is selected from F, H, I, L, M, V, W, and Y.

[1219] Aspect 9. The IL-2Rα ligand of any one of aspects 7 to 8, wherein X^2 is selected from F, I, L, M, V, W, and Y.

[1220] Aspect 10. The IL-2Rα ligand of any one of aspects 7 to 9, wherein X^3 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1221] Aspect 11. The IL-2Rα ligand of any one of aspects 7 to 10, wherein X^4 is selected from F, I, L, M, V, W, and Y.

[1222] Aspect 12. The IL-2Rα ligand of any one of aspects 7 to 11, wherein X^5 is selected from H, N, Q, Y, A, G, P, S, and T.

[1223] Aspect 13. The IL-2Rα ligand of any one of aspects 7 to 12, wherein X^6 is selected from F, I, L, M, V, W, and Y.

[1224] Aspect 14. The IL-2Rα ligand of any one of aspects 7 to 13, wherein X^7 is selected from F, I, L, M, V, W, and Y.

[1225] Aspect 15. The IL-2Rα ligand of any one of aspects 7 to 14, wherein X^8 is selected from F, I, L, M, V, W, and Y.

[1226] Aspect 16. The IL-2Rα ligand of any one of aspects 7 to 15, wherein X^9 is selected from A, G, P, S, and T.

[1227] Aspect 17. The IL-2Rα ligand of any one of aspects 7 to 16, wherein X^{10} is selected from H, N, Q, S, T, and Y.

[1228] Aspect 18. The IL-2Rα ligand of any one of aspects 7 to 177, wherein X^{11} is selected from F, I, L, M, V, W, and Y.

[1229] Aspect 19. The IL-2Rα ligand of any one of aspects 7 to 18, wherein X^{12} is selected from F, I, L, M, V, W, and Y.

[1230] Aspect 20. The IL-2Rα ligand of any one of aspects 7 to 19, wherein X^1 is selected from L, W, and F.

[1231] Aspect 21. The IL-2Rα ligand of any one of aspects 7 to 20, wherein X^2 is selected from D, A, L, and V.

[1232] Aspect 22. The IL-2Rα ligand of any one of aspects 7 to 21, wherein X^3 is selected from L, V, H, P, and E.

[1233] Aspect 23. The IL-2Rα ligand of any one of aspects 7 to 22, wherein X^4 is selected from T, D, and W.

[1234] Aspect 24. The IL-2Rα ligand of any one of aspects 7 to 23, wherein X^5 is selected from Y, W, P, and Q.

[1235] Aspect 25. The IL-2Rα ligand of any one of aspects 7 to 24, wherein X^6 is selected from D, S, V, and A.

[1236] Aspect 26. The IL-2Rα ligand of any one of aspects 7 to 25, wherein X^7 is selected from E and Y.

[1237] Aspect 27. The IL-2Rα ligand of any one of aspects 7 to 26, wherein X^8 is selected from L and F.

[1238] Aspect 28. The IL-2Rα ligand of any one of aspects 7 to 27, wherein X^9 is selected from L, R, and S.

[1239] Aspect 29. The IL-2Rα ligand of any one of aspects 7 to 28, wherein X^{10} is selected from A, R, and Q.

[1240] Aspect 30. The IL-2Rα ligand of any one of aspects 7 to 29, wherein X^{11} is selected from C, R, V, and M.

[1241] Aspect 31. The IL-2Rα ligand of any one of aspects 7 to 30, wherein X^{12} is selected from T, L, and M.

[1242] Aspect 32. The IL-2Rα ligand of any one of aspects 7 to 31, wherein X^1 is F.

[1243] Aspect 33. The IL-2Rα ligand of any one of aspects 7 to 32, wherein X^2 is selected from L and V.

[1244] Aspect 34. The IL-2Rα ligand of any one of aspects 7 to 33, wherein X^3 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1245] Aspect 35. The IL-2Rα ligand of any one of aspects 7 to 34, wherein X^4 is W.

[1246] Aspect 36. The IL-2Rα ligand of any one of aspects 7 to 35, wherein X^5 is P.

[1247] Aspect 37. The IL-2Rα ligand of any one of aspects 7 to 36, wherein X^6 is V.

[1248] Aspect 38. The IL-2Rα ligand of any one of aspects 7 to 37, wherein X^7 is Y.

[1249] Aspect 39. The IL-2Rα ligand of any one of aspects 7 to 38, wherein X^8 is F.

[1250] Aspect 40. The IL-2Rα ligand of any one of aspects 7 to 39, wherein X^9 is S.

[1251] Aspect 41. The IL-2Rα ligand of any one of aspects 7 to 40, wherein X^{10} is Q.

[1252] Aspect 42. The IL-2Rα ligand of any one of aspects 7 to 41, wherein X^{11} is selected from N and V.

[1253] Aspect 43. The IL-2Rα ligand of any one of aspects 7 to 42, wherein X^{12} is selected from L and M.

[1254] Aspect 44. The IL-2Rα ligand of aspect 7, wherein X^1 is F, X^4 is W, X^5 is P, X^6, is V, X^7 is Y, X^8 is F, X^9 is S, and X^{10} is Q.

[1255] Aspect 45. The IL-2Rα ligand of aspect 7,

X^1 is F;

X^2 is selected from F, H, I, L, M, V, W, and Y;

X^3 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^4 is W;

X^5 is selected from H, N, Q, Y, A, G, P, S, and T;

X^6 is V;

X^7 is Y;

X^8 is F;

X^9 is S;

X^{10} is Q;

X^{11} is selected from F, I, L, M, V, W, and Y; and

X^{12} is selected from F, I, L, M, V, W, and Y.

[1256] Aspect 46. The IL-2Rα ligand of aspect 7, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 2 to SEQ ID NO: 6:

SEQ ID NO: 2	L	D	L	T	Y	D	E	L	L	A	C	T
SEQ ID NO: 3	W	A	Y	D	W	S	C	F	R	R	R	L
SEQ ID NO: 4	F	L	H	W	P	V	Y	F	C	Q	V	M
SEQ ID NO: 5	F	L	P	W	P	V	Y	F	S	Q	V	L
SEQ ID NO: 6	F	V	E	W	Q	A	Y	F	S	Q	M	M

[1257] Aspect 47. The IL-2Rα ligand of any one of aspects 7 to 46, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1258] Aspect 48. The IL-2Rα ligand of aspects 46 to 47, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1259] Aspect 49. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (2) (SEQ ID NO: 7):

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (2)$$

wherein,

X^1 is selected from an amino acid comprising a large hydrophobic side chain;

X^2 is selected from an amino acid comprising a large hydrophobic side chain;

X^3 is selected from an amino acid comprising a small hydrophobic side chain;

X^4 is selected from an amino acid comprising a large hydrophobic side chain;

X^5 is selected from an amino acid comprising an acidic side chain;

X^6 is selected from an amino acid comprising an acidic side chain;

X^7 is selected from an amino acid comprising a large hydrophobic side chain;

X^8 is selected from an amino acid comprising a large hydrophobic side chain;

X^9 is selected from an amino acid;

X^{10} is selected from an amino acid comprising a polar/neutral side chain;

X^{11} is selected from an amino acid comprising a large hydrophobic side chain; and

X^{12} is selected from an amino acid comprising a large hydrophobic side chain.

[1260] Aspect 50. The IL-2Rα ligand of aspect 49, wherein X^1 is selected from F, I, L, M, V, W, and Y.

[1261] Aspect 51. The IL-2Rα ligand of any one of aspects 49 to 50, wherein X^2 is selected from F, I, L, M, V, W, and Y.

[1262] Aspect 52. The IL-2Rα ligand of any one of aspects 49 to 51, wherein X^3 is selected from A, G, P, S, and T.

[1263] Aspect 53. The IL-2Rα ligand of any one of aspects 49 to 52, wherein X^4 is selected from F, I, L, M, V, W, and Y.

[1264] Aspect 54. The IL-2Rα ligand of any one of aspects 49 to 53, wherein X^6 is selected from D and E.

[1265] Aspect 55. The IL-2Rα ligand of any one of aspects 49 to 54, wherein X^7 is selected from F, I, L, M, V, W, and Y.

[1266] Aspect 56. The IL-2Rα ligand of any one of aspects 49 to 55, wherein X^8 is selected from F, I, L, M, V, W, and Y.

[1267] Aspect 57. The IL-2Rα ligand of any one of aspects 49 to 56, wherein X^9 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1268] Aspect 58. The IL-2Rα ligand of any one of aspects 49 to 57, wherein X^{10} is selected from H, N, Q, S, T, and Y.

[1269] Aspect 59. The IL-2Rα ligand of any one of aspects 49 to 58, wherein X^{11} is selected from F, I, L, M, V, W, and Y.

[1270] Aspect 60. The IL-2Rα ligand of any one of aspects 49 to 59, wherein X^{12} is selected from F, I, L, M, V, W, and Y.

[1271] Aspect 61. The IL-2Rα ligand of any one of aspects 49 to 60, wherein X^1 is F.

[1272] Aspect 62. The IL-2Rα ligand of any one of aspects 49 to 61, wherein X^2 is selected from I, L, and V.

[1273] Aspect 63. The IL-2Rα ligand of any one of aspects 49 to 62, wherein X^3 is P.

[1274] Aspect 64. The IL-2Rα ligand of any one of aspects 49 to 63, wherein X^4 is W.

[1275] Aspect 65. The IL-2Rα ligand of any one of aspects 49 to 64, wherein X^5 is selected from P, D, and E.

[1276] Aspect 66. The IL-2Rα ligand of any one of aspects 49 to 65, wherein X^6 is selected from V and E.

[1277] Aspect 67. The IL-2Rα ligand of any one of aspects 49 to 66, wherein X^7 is Y.

[1278] Aspect 68. The IL-2Rα ligand of any one of aspects 49 to 67, wherein X^8 is F.

[1279] Aspect 69. The IL-2Rα ligand of any one of aspects 49 to 68, wherein X^9 is selected from S, A, K, and L.

[1280] Aspect 70. The IL-2Rα ligand of any one of aspects 49 to 69, wherein X^{10} is Q.

[1281] Aspect 71. The IL-2Rα ligand of any one of aspects 49 to 70, wherein X^{11} is selected from V, I, and L.

[1282] Aspect 72. The IL-2Rα ligand of any one of aspects 49 to 71, wherein X^{12} is selected from L and M.

[1283] Aspect 73. The IL-2Rα ligand of any one of aspects 49 to 72, wherein X^1 is F.

[1284] Aspect 74. The IL-2Rα ligand of any one of aspects 49 to 73, wherein X^2 is selected from L and V.

[1285] Aspect 75. The IL-2Rα ligand of any one of aspects 49 to 74, wherein X^3 is P.

[1286] Aspect 76. The IL-2Rα ligand of any one of aspects 49 to 75, wherein X^4 is W.

[1287] Aspect 77. The IL-2Rα ligand of any one of aspects 49 to 76, wherein X^5 is D.

[1288] Aspect 78. The IL-2Rα ligand of any one of aspects 49 to 77, wherein X^6 is E.

[1289] Aspect 79. The IL-2Rα ligand of any one of aspects 49 to 78, wherein X^7 is Y.

[1290] Aspect 80. The IL-2Rα ligand of any one of aspects 49 to 79, wherein X^8 is F.

[1291] Aspect 81. The IL-2Rα ligand of any one of aspects 49 to 80, wherein X^9 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1292] Aspect 82. The IL-2Rα ligand of any one of aspects 49 to 80, wherein X^9 is S.

[1293] Aspect 83. The IL-2Rα ligand of any one of aspects 49 to 82, wherein X^{10} is Q.

[1294] Aspect 84. The IL-2Rα ligand of any one of aspects 49 to 83, wherein X^{11} is selected from I, L, and V.

[1295] Aspect 85. The IL-2Rα ligand of any one of aspects 49 to 84, wherein X^{12} is L.

[1296] Aspect 86. The IL-2Rα ligand of aspect 49, wherein X^1 is F, X^3 is P, X^4 is W, X^5 is D, X^6, is E, X^7 is Y, X^8 is F, X^{10} is Q, and X^{12} is L.

[1297] Aspect 87. The IL-2Rα ligand of aspect 49, wherein,

X^1 is F;

X^2 is selected from F, I, L, M, V, W, and Y;

X^3 is P;

X^4 is W;

X^5 is selected from D and P;

X^6 is E;

X^7 is Y;

X^8 is F;

X^9 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} is Q;

X^{11} is selected from F, I, L, M, V, W, and Y; and

X^{12} is L.

[1298] Aspect 88. The IL-2Rα ligand of aspect 49, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 8 to SEQ ID NO: 15:

SEQ ID NO: 8	F	I	P	W	D	E	Y	F	A	Q	L	L
SEQ ID NO: 9	F	I	P	W	D	E	Y	F	K	Q	V	L
SEQ ID NO: 10	F	V	P	W	D	V	Y	F	S	Q	I	L
SEQ ID NO: 11	F	I	P	W	D	E	Y	F	K	Q	V	L
SEQ ID NO: 12	F	V	P	W	P	E	Y	F	L	Q	I	M
SEQ ID NO: 13	F	I	P	W	E	E	Y	F	S	Q	L	L
SEQ ID NO: 14	F	I	P	W	P	E	Y	F	S	Q	L	L
SEQ ID NO: 15	F	V	P	W	D	E	Y	F	L	Q	I	L

[1299] Aspect 89. The IL-2Rα ligand of any one of aspects 49 to 88, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1300] Aspect 90. The IL-2Rα ligand of any one of aspects 88 to 89, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1301] Aspect 91. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (3a) (SEQ ID NO: 16), the amino acid sequence of Formula (3b) (SEQ ID NO: 17), or the amino acid sequence of Formula (3c) (SEQ ID NO: 18):

$$–X^5–X^6–X^7–X^8– \quad (3a)$$

$$–X^3–C–X^5–X^6–X^7–X^8–C–X^{10}– \quad (3b)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}– \quad (3c)$$

wherein,

X^1 is selected from an amino acid comprising a large hydrophobic side chain;

X^2 is selected from an amino acid comprising a large hydrophobic side chain;

X^3 is selected from an amino acid;

X^4 is C;

X^5 is selected from an amino acid comprising a small hydrophobic side chain;

X^6 is selected from an amino acid;

X^7 is selected from an amino acid;

X^8 is selected from amino acid comprising a small hydrophobic side chain;

X^9 is C;

X^{10} is selected from an amino acid comprising a basic side chain or a polar/neutral side chain;

X^{11} is selected from an amino acid comprising a small hydrophobic side chain; and

X^{12} is selected from an amino acid.

[1302] Aspect 92. The IL-2Rα ligand of aspect 91, wherein X^1 is selected from F, I, L, M, V, W, and Y.

[1303] Aspect 93. The IL-2Rα ligand of any one of aspects 91 to 92, wherein X^2 is selected from F, I, L, M, V, W, and Y.

[1304] Aspect 94. The IL-2Rα ligand of any one of aspects 91 to 93, wherein X^3 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1305] Aspect 95. The IL-2Rα ligand of any one of aspects 91 to 94, wherein X^4 is C.

[1306] Aspect 96. The IL-2Rα ligand of any one of aspects 91 to 95, wherein X^5 is selected from A, G, P, S, and T.

[1307] Aspect 97. The IL-2Rα ligand of any one of aspects 91 to 96, wherein X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1308] Aspect 98. The IL-2Rα ligand of any one of aspects 91 to 97, wherein X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1309] Aspect 99. The IL-2Rα ligand of any one of aspects 91 to 98, wherein X^8 is selected from A, G, P, S, and T.

[1310] Aspect 100. The IL-2Rα ligand of any one of aspects 91 to 99, wherein X^9 is C.

[1311] Aspect 101. The IL-2Rα ligand of any one of aspects 91 to 100, wherein X^{10} is selected from H, K, N, Q, R, S, T, and Y.

[1312] Aspect 102. The IL-2Rα ligand of any one of aspects 91 to 101, wherein X^{11} is selected from A, G, P, S, and T.

[1313] Aspect 103. The IL-2Rα ligand of any one of aspects 91 to 102, wherein X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1314] Aspect 104. The IL-2Rα ligand of any one of aspects 91 to 103, wherein X^1 is selected from Y and W.

[1315] Aspect 105. The IL-2Rα ligand of any one of aspects 91 to 104, wherein X^2 is V.

[1316] Aspect 106. The IL-2Rα ligand of any one of aspects 91 to 105, wherein X^3 is selected from M and I.

[1317] Aspect 107. The IL-2Rα ligand of any one of aspects 91 to 106, wherein X^4 is C.

[1318] Aspect 108. The IL-2Rα ligand of any one of aspects 91 to 107, wherein X^5 is S.

[1319] Aspect 109. The IL-2Rα ligand of any one of aspects 91 to 108, wherein X^6 is A.

[1320] Aspect 110. The IL-2Rα ligand of any one of aspects 91 to 109, wherein X^7 is F, L, V, and M.

[1321] Aspect 111. The IL-2Rα ligand of any one of aspects 91 to 110, wherein X^8 is G.

[1322] Aspect 112. The IL-2Rα ligand of any one of aspects 91 to 111, wherein X^9 is C.

[1323] Aspect 113. The IL-2Rα ligand of any one of aspects 91 to 112, wherein X^{10} is selected from K and R.

[1324] Aspect 114. The IL-2Rα ligand of any one of aspects 91 to 113, wherein X^{11} is selected from S, P, and A.

[1325] Aspect 115. The IL-2Rα ligand of any one of aspects 91 to 114, wherein X^{12} is selected from I, L, M, F, and W.

[1326] Aspect 116. The IL-2Rα ligand of any one of aspects 91 to 115, wherein X^1 is selected from F, I, L, M, V, W, and Y.

[1327] Aspect 117. The IL-2Rα ligand of any one of aspects 91 to 116, wherein X^2 is V.

[1328] Aspect 118. The IL-2Rα ligand of any one of aspects 91 to 117, wherein X^3 is selected from F, I, L, M, V, W, and Y.

[1329] Aspect 119. The IL-2Rα ligand of any one of aspects 91 to 118, wherein X^4 is C.

[1330] Aspect 120. The IL-2Rα ligand of any one of aspects 91 to 119, wherein X^5 is G.

[1331] Aspect 121. The IL-2Rα ligand of any one of aspects 91 to 120, wherein X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1332] Aspect 122. The IL-2Rα ligand of any one of aspects 91 to 121, wherein X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1333] Aspect 123. The IL-2Rα ligand of any one of aspects 91 to 122, wherein X^8 is G.

[1334] Aspect 124. The IL-2Rα ligand of any one of aspects 91 to 123, wherein X^9 is C.

[1335] Aspect 125. The IL-2Rα ligand of any one of aspects 91 to 124, wherein X^{10} is R.

[1336] Aspect 126. The IL-2Rα ligand of any one of aspects 91 to 125, wherein X^{11} is S.

[1337] Aspect 127. The IL-2Rα ligand of any one of aspects 91 to 126, wherein X^{12} is selected from F, I, L, M, V, W, and Y.

[1338] Aspect 128. The IL-2Rα ligand of any one of aspects 91 to 126, wherein X^{12} is V.

[1339] Aspect 129. The IL-2Rα ligand of aspect 91, wherein X^2 is V, X^4 is C, X^5 is G, X^8 is G, X^9 is C, X^{10} is R, and X^{11} is S.

[1340] Aspect 130. The IL-2Rα ligand of aspect 91, wherein,

X^1 is selected from F, I, L, M, V, W, and Y;

X^2 is V;

X^3 is selected from F, I, L, M, V, W, and Y;

X^4 is C;

X^5 is G;

X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is G;

X^9 is C;

X^{10} is R;

X^{11} is S; and

X^{12} is selected from F, I, L, M, V, W, and Y.

[1341] Aspect 131. The IL-2Rα ligand of aspect 91, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 19 to SEQ ID NO: 24:

SEQ ID NO: 19	F	V	L	C	G	L	Q	G	C	R	G	S
SEQ ID NO: 20	K	V	I	C	G	W	D	G	C	R		
SEQ ID NO: 21	L	V	F	C	G	K	N	G	C	H	S	G
SEQ ID NO: 22	V	V	L	C	T	P	K	G	C	R	S	A
SEQ ID NO: 23	Y	V	M	C	S	A	F	G	C	K	S	I
SEQ ID NO: 24	F	V	H	C	T	L	L	G	C	W	S	G

[1342] Aspect 132. The IL-2Rα ligand of any one of aspects 91 to 131, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1343] Aspect 133. The IL-2Rα ligand of any one of aspects 131 to 132, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1344] Aspect 134. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (4a) (SEQ ID NO: 25), the amino acid sequence of Formula (4b) (SEQ ID NO: 26), the amino acid sequence of Formula (4c) (SEQ ID NO: 27), or the amino acid sequence of Formula (4d) (SEQ ID NO: 28):

$$-X^5-X^6-X^7-X^8-X^9- \quad (4a)$$

$$-X^3-C-X^5-X^6-X^7-X^8-C-X^{10}- \quad (4b)$$

$$-X^2-X^3-C-X^5-X^6-X^7-X^8-C-X^{10}-X^{11}- \quad (4c)$$

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (4d)$$

wherein,

X^1 is selected from an amino acid comprising a large hydrophobic side chain;

X^2 is selected from an amino acid comprising a large hydrophobic side chain;

X^3 is selected from an amino acid comprising a large hydrophobic side chain;

X^4 is C;

X^5 is selected from an amino acid comprising a small hydrophobic side chain;

X^6 is selected from an amino acid comprising a small hydrophobic side chain;

X^7 is selected from an amino acid comprising a large hydrophobic side chain;

X^8 is selected from an amino acid comprising a small hydrophobic side chain;

X^9 is C;

X^{10} is selected from an amino acid comprising a basic side chain;

X^{11} is selected from an amino acid comprising a small hydrophobic side chain; and

X^{12} is selected from an amino acid comprising a large hydrophobic side chain.

[1345] Aspect 135. The IL-2Rα ligand of aspect 134, wherein X^1 is selected from F, I, L, M, V, W, and Y.

[1346] Aspect 136. The IL-2Rα ligand of any one of aspects 134 to 135, wherein X^2 is selected from F, I, L, M, V, W, and Y.

[1347] Aspect 137. The IL-2Rα ligand of any one of aspects 134 to 136, wherein X^3 is selected from F, I, L, M, V, W, and Y.

[1348] Aspect 138. The IL-2Rα ligand of any one of aspects 134 to 137, wherein X^4 is C.

[1349] Aspect 139. The IL-2Rα ligand of any one of aspects 134 to 138, wherein X^5 is selected from A, G, P, S, and T.

[1350] Aspect 140. The IL-2Rα ligand of any one of aspects 134 to 139, wherein X^6 is selected from A, G, P, S, and T.

[1351] Aspect 141. The IL-2Rα ligand of any one of aspects 134 to 140, wherein X^7 is selected from F, I, L, M, V, W, and Y.

[1352] Aspect 142. The IL-2Rα ligand of any one of aspects 134 to 141, wherein X^8 is selected from A, G, P, S, and T.

[1353] Aspect 143. The IL-2Rα ligand of any one of aspects 134 to 142, wherein X^9 is C.

[1354] Aspect 144. The IL-2Rα ligand of any one of aspects 134 to 143, wherein X^{10} is selected from H, K, and R.

[1355] Aspect 145. The IL-2Rα ligand of any one of aspects 134 to 144, wherein X^{11} is selected from A, G, P, S, and T.

[1356] Aspect 146. The IL-2Rα ligand of any one of aspects 134 to 145, wherein X^{12} is selected from F, I, L, M, V, W, and Y.

[1357] Aspect 147. The IL-2Rα ligand of any one of aspects 134 to 146, wherein X^1 is selected from Y and W.

[1358] Aspect 148. The IL-2Rα ligand of any one of aspects 134 to 147, wherein X^2 is V.

[1359] Aspect 149. The IL-2Rα ligand of any one of aspects 134 to 148, wherein X^3 is selected from M and I.

[1360] Aspect 150. The IL-2Rα ligand of any one of aspects 134 to 149, wherein X^4 is C.

[1361] Aspect 151. The IL-2Rα ligand of any one of aspects 134 to 150, wherein X^5 is S.

[1362] Aspect 152. The IL-2Rα ligand of any one of aspects 134 to 151, wherein X^6 is A.

[1363] Aspect 153. The IL-2Rα ligand of any one of aspects 134 to 152, wherein X^7 is selected from F, L, V, and M.

[1364] Aspect 154. The IL-2Rα ligand of any one of aspects 134 to 153, wherein X^8 is G.

[1365] Aspect 155. The IL-2Rα ligand of any one of aspects 134 to 154, wherein X^9 is C.

[1366] Aspect 156. The IL-2Rα ligand of any one of aspects 134 to 155, wherein X^{10} is selected from R and K.

[1367] Aspect 157. The IL-2Rα ligand of any one of aspects 134 to 156, wherein X^{11} is selected from S, P, and A.

[1368] Aspect 158. The IL-2Rα ligand of any one of aspects 134 to 157, wherein X^{12} is selected from I, M, F, and W.

[1369] Aspect 159. The IL-2Rα ligand of any one of aspects 134 to 158, wherein X^1 is W.

[1370] Aspect 160. The IL-2Rα ligand of any one of aspects 134 to 159, wherein X^2 is V.

[1371] Aspect 161. The IL-2Rα ligand of any one of aspects 134 to 160, wherein X^3 is I.

[1372] Aspect 162. The IL-2Rα ligand of any one of aspects 134 to 161, wherein X^4 is C.

[1373] Aspect 163. The IL-2Rα ligand of any one of aspects 134 to 162, wherein X^5 is S

[1374] Aspect 164. The IL-2Rα ligand of any one of aspects 134 to 163, wherein X^6 is A.

[1375] Aspect 165. The IL-2Rα ligand of any one of aspects 134 to 164, wherein X^7 is selected from F, I, L, M, V, W, and Y.

[1376] Aspect 166. The IL-2Rα ligand of any one of aspects 134 to 165, wherein X^8 is G.

[1377] Aspect 167. The IL-2Rα ligand of any one of aspects 134 to 166, wherein X^9 is C.

[1378] Aspect 168. The IL-2Rα ligand of any one of aspects 134 to 167, wherein X^{10} is R.

[1379] Aspect 169. The IL-2Rα ligand of any one of aspects 134 to 168, wherein X^{11} is S.

[1380] Aspect 170. The IL-2Rα ligand of any one of aspects 134 to 169, wherein X^{12} is selected from F, I, L, M, V, W, and Y.

[1381] Aspect 171. The IL-2Rα ligand of aspect 134, wherein X^1 is W, X^2 is V, X^3 is I, X^4 is C, X^5 is S, X^6 is A, X^8 is G, X^9 is C, X^{10} is R, and X^{11} is S.

[1382] Aspect 172. The IL-2Rα ligand of aspect 134, wherein,

X^1 is W;

X^2 is V;

X^3 is I;

X^4 is C;

X^5 is S;

X^6 is A;

X^7 is selected from F, I, L, M, V, W, and Y.

X^8 is G;

X^9 is C;

X^{10} is selected from R and K;

X^{11} is S; and

X^{12} is selected from F, I, L, M, V, W, and Y.

[1383] Aspect 173. The IL-2Rα ligand of aspect 134, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 29 to SEQ ID NO: 36:

SEQ ID NO: 29	W	V	I	C	S	A	L	G	C	R	S	L
SEQ ID NO: 30	W	V	I	C	S	A	L	G	C	R	S	M
SEQ ID NO: 31	W	V	I	C	S	A	V	G	C	R	P	F
SEQ ID NO: 32	W	V	I	C	S	A	M	G	C	R	S	I
SEQ ID NO: 33	W	V	I	C	S	A	L	G	C	R	S	I
SEQ ID NO: 34	W	V	I	C	S	A	F	G	C	R	S	M
SEQ ID NO: 35	W	V	I	C	S	A	L	G	C	R	P	F
SEQ ID NO: 36	W	V	I	C	S	A	L	G	C	K	A	W

[1384] Aspect 174. The IL-2Rα ligand of any one of aspects 134 to 173, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1385] Aspect 175. The IL-2Rα ligand of any one of aspects 173 to 174,

wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1386] Aspect 176. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (5a) (SEQ ID NO: 37), the amino acid sequence of Formula (5b) (SEQ ID NO: 38), the amino acid sequence of Formula (5c) (SEQ ID NO: 39), or the amino acid sequence of Formula (5d) (SEQ ID NO: 40):

$$–X^5–X^6–X^7–X^8–X^9– \quad (5a)$$

$$–X^3–C–X^5–X^6–X^7–X^8–X^9–C–X^{11}— \quad (5b)$$

$$–X^3–X^4–C–X^5–X^6–X^7–X^8–X^9–C–X^{11}–X^{12}– \quad (5c)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}– \quad (5d)$$

wherein,

X^1 is selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^2 is selected from an amino acid comprising a large hydrophobic side chain;

X^3 is selected from an amino acid comprising a large hydrophobic side chain;

X^4 is C;

X^5 is selected from an amino acid comprising a small hydrophobic side chain or an acidic side chain;

X^6 is selected from an amino acid;

X^7 is selected from an amino acid;

X^8 is selected from an amino acid;

X^9 is selected from an amino acid comprising a small hydrophobic side chain;

X^{10} is C;

X^{11} is selected from an amino acid comprising a basic side chain; and

X^{12} is selected from an amino acid.

[1387] Aspect 177. The IL-2Rα ligand of aspect 176, wherein X^1 is selected from F, H, I, L, M, V, W, and Y.

[1388] Aspect 178. The IL-2Rα ligand of any one of aspects 176 to 177, wherein X^2 is selected from F, I, L, M, V, W, and Y.

[1389] Aspect 179. The IL-2Rα ligand of any one of aspects 176 to 178, wherein X^3 is selected from F, I, L, M, V, W, and Y.

[1390] Aspect 180. The IL-2Rα ligand of any one of aspects 176 to 179, wherein X^4 is C.

[1391] Aspect 181. The IL-2Rα ligand of any one of aspects 176 to 180, wherein X^5 is selected from A, G, H, K, P, R, S, and T.

[1392] Aspect 182. The IL-2Rα ligand of any one of aspects 176 to 181, wherein X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1393] Aspect 183. The IL-2Rα ligand of any one of aspects 176 to 182, wherein X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1394] Aspect 184. The IL-2Rα ligand of any one of aspects 176 to 183, wherein X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1395] Aspect 185. The IL-2Rα ligand of any one of aspects 176 to 184, wherein X^9 is selected from A, G, P, S, and T.

[1396] Aspect 186. The IL-2Rα ligand of any one of aspects 176 to 185, wherein X^{10} is C.

[1397] Aspect 187. The IL-2Rα ligand of any one of aspects 176 to 186, wherein X^{11} is selected from H, K, and R.

[1398] Aspect 188. The IL-2Rα ligand of any one of aspects 176 to 187, wherein X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1399] Aspect 189. The IL-2Rα ligand of any one of aspects 176 to 188, wherein X^1 is selected from F, H, W, and Y.

[1400] Aspect 190. The IL-2Rα ligand of any one of aspects 176 to 189, wherein X^2 is V.

[1401] Aspect 191. The IL-2Rα ligand of any one of aspects 176 to 190, wherein X^3 is selected from F, I, L, M, V, W, and Y.

[1402] Aspect 192. The IL-2Rα ligand of any one of aspects 176 to 191, wherein X^4 is selected from F, K, L, V, W, and H.

[1403] Aspect 193. The IL-2Rα ligand of any one of aspects 176 to 192, wherein X^5 is V.

[1404] Aspect 194. The IL-2Rα ligand of any one of aspects 176 to 193, wherein X^5 is selected from L, F, M, H, T, A, and I.

[1405] Aspect 195. The IL-2Rα ligand of any one of aspects 176 to 194, wherein X^5 is C.

[1406] Aspect 196. The IL-2Rα ligand of any one of aspects 176 to 195, wherein X^6 is selected from G, T, S, R, and K.

[1407] Aspect 197. The IL-2Rα ligand of any one of aspects 176 to 196, wherein X^6 is selected from L, W, K, P, A, N, W, and V.

[1408] Aspect 198. The IL-2Rα ligand of any one of aspects 176 to 197, wherein X^7 is selected from Q, D, N, K, F, L, R, G, and D,

[1409] Aspect 199. The IL-2Rα ligand of any one of aspects 176 to 198, wherein X^8 is selected from G, N, Y, H, and G.

[1410] Aspect 200. The IL-2Rα ligand of any one of aspects 176 to 199, wherein X^9 is G.

[1411] Aspect 201. The IL-2Rα ligand of any one of aspects 176 to 200, wherein X^{10} is C.

[1412] Aspect 202. The IL-2Rα ligand of any one of aspects 176 to 201, wherein X^{11} is selected from G, S, R, T, and Y.

[1413] Aspect 203. The IL-2Rα ligand of any one of aspects 176 to 202, wherein X^{12} is selected from S, G, A, I, G, P, R, and S.

[1414] Aspect 204. The IL-2Rα ligand of any one of aspects 176 to 203, wherein X^1 is selected from F, W, and Y.

[1415] Aspect 205. The IL-2Rα ligand of any one of aspects 176 to 204, wherein X^2 is V.

[1416] Aspect 206. The IL-2Rα ligand of any one of aspects 176 to 205, wherein X^3 is selected from F, I, L, M, V, W, and Y.

[1417] Aspect 207. The IL-2Rα ligand of any one of aspects 176 to 206, wherein X^4 is C.

[1418] Aspect 208. The IL-2Rα ligand of any one of aspects 176 to 207, wherein X^5 is selected from A, G, P, S, and T.

[1419] Aspect 209. The IL-2Rα ligand of any one of aspects 176 to 208, wherein X^5 is selected from H, K, and R.

[1420] Aspect 210. The IL-2Rα ligand of any one of aspects 176 to 209, wherein X^5 is S.

[1421] Aspect 211. The IL-2Rα ligand of any one of aspects 176 to 210, wherein X^6 is selected from F, I, L, M, V, W, and Y.

[1422] Aspect 212. The IL-2Rα ligand of any one of aspects 176 to 211, wherein X^6 is W.

[1423] Aspect 213. The IL-2Rα ligand of any one of aspects 176 to 212, wherein X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1424] Aspect 214. The IL-2Rα ligand of any one of aspects 176 to 213, wherein X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1425] Aspect 215. The IL-2Rα ligand of any one of aspects 176 to 214, wherein X^9 is G.

[1426] Aspect 216. The IL-2Rα ligand of any one of aspects 176 to 215, wherein X^{10} is C.

[1427] Aspect 217. The IL-2Rα ligand of any one of aspects 176 to 216, wherein X^{11} is R.

[1428] Aspect 218. The IL-2Rα ligand of any one of aspects 176 to 217, wherein X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1429] Aspect 219. The IL-2Rα ligand of aspect 176, wherein X^2 is V, X^4 is C, X^5 is S, X^9 is G, X^{10} is C, and X^{11} is R.

[1430] Aspect 220. The IL-2Rα ligand of aspect 176, wherein,

X^1 is selected from F, H, I, L, M, V, W, and Y;

X^2 is V;

X^3 is selected from F, I, L, M, V, W, and Y;

X^4 is C;

X^5 is S;

X^6 is selected from F, I, L, M, V, W, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 is G;

X^{10} is C;

X^{11} is R; and

X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1431] Aspect 221. The IL-2Rα ligand of aspect 176, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 41 to SEQ ID NO: 45:

SEQ ID NO: 41	Y	V	L	C	S	N	R	N	G	C	R	P
SEQ ID NO: 42	Y	V	T	C	R	W	G	Y	G	C	T	R
SEQ ID NO: 43	W	V	A	C	S	W	D	H	G	C	R	S
SEQ ID NO: 44	H	V	I	C	S	V	N	G	G	C	R	G
SEQ ID NO: 45	W	V	X	C	K	P	L	H	G	C	Y	G

[1432] Aspect 222. The IL-2Rα ligand of any one of aspects 176 to 221, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1433] Aspect 223. The IL-2Rα ligand of any one of aspects 221 to 222, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1434] Aspect 224. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (6a) (SEQ ID NO: 46), the amino acid sequence of Formula (6b) (SEQ ID NO: 47), the amino acid sequence of Formula (6c) (SEQ ID NO: 48), or the amino acid sequence of Formula (6d) (SEQ ID NO: 49):

$$–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}– \quad (6a)$$

$$–X^3–C–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–C–X^{13}— \quad (6b)$$

$$–X^2–X^3–C–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–C–X^{13}–X^{14}– \quad (6c)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}–X^{14}–X^{15}– \quad (6d)$$

wherein,

X^1 is selected from an amino acid;

X^2 is selected from an amino acid;

X^3 is selected from an amino acid comprising a large hydrophobic side chain or an aromatic side chain;

X^4 is C;

X^5 is selected from an amino acid comprising a large hydrophobic side chain;

X^6 is selected from an amino acid comprising a basic side chain;

X^7 is selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain;

X^8 is selected from an amino acid comprising an acidic side chain;

X^9 is selected from an amino acid comprising a small hydrophobic side chain;

X^{10} is selected from an amino acid;

X^{11} is selected from an amino acid comprising a small hydrophobic side chain;

X^{12} is C;

X^{13} is selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^{14} is selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain; and

X^{15} is selected from an amino acid.

[1435] Aspect 225. The IL-2Rα ligand of aspect 224, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 is selected from F, H, I, L, M, V, W, and Y;

X^4 is C;

X^5 is selected from F, I, L, M, V, W, and Y;

X^6 is selected from H, K, and R;

X^7 is selected from A, G, H, N, P, Q, S, T, and Y;

X^8 is selected from D and E;

X^9 is selected from A, G, P, S, and T;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is selected from A, G, P, S, and T;

X^{12} is C;

X^{13} is selected from F, H, I, L, M, V, W, and Y;

X^{14} is selected from A, G, H, N, P, Q, S, T, and Y; and

X^{15} is selected from any A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1436] Aspect 226. The IL-2Rα ligand f any one of aspects 224 to 225, wherein X^1 is selected from E, K, R, T, and L.

[1437] Aspect 227. The IL-2Rα ligand of any one of aspects 224 to 226, wherein X^2 is selected from Q, Y, V, K, and R.

[1438] Aspect 228. The IL-2Rα ligand of any one of aspects 224 to 227, wherein X^3 is selected from F, W, V, and L.

[1439] Aspect 229. The IL-2Rα ligand of any one of aspects 224 to 228, wherein X^4 is C.

[1440] Aspect 230. The IL-2Rα ligand of any one of aspects 224 to 229, wherein X^5 is L.

[1441] Aspect 231. The IL-2Rα ligand of any one of aspects 224 to 230, wherein X^6 is selected from V, R, A, and K.

[1442] Aspect 232. The IL-2Rα ligand of any one of aspects 224 to 231, wherein X^7 is S.

[1443] Aspect 233. The IL-2Rα ligand of any one of aspects 224 to 232, wherein X^8 is selected from D and E.

[1444] Aspect 234. The IL-2Rα ligand of any one of aspects 224 to 233, wherein X^9 is P.

[1445] Aspect 235. The IL-2Rα ligand of any one of aspects 224 to 234, wherein X^{10} is selected from M, D, N, M Q, and T.

[1446] Aspect 236. The IL-2Rα ligand of any one of aspects 224 to 235, wherein X^{11} is selected from A and S.

[1447] Aspect 237. The IL-2Rα ligand of any one of aspects 224 to 236, wherein X^{12} is C.

[1448] Aspect 238. The IL-2Rα ligand of any one of aspects 224 to 237, wherein X^{13} is selected from F and W.

[1449] Aspect 239. The IL-2Rα ligand of any one of aspects 224 to 238, wherein X^{14} is selected from S, A, and I.

[1450] Aspect 240. The IL-2Rα ligand of any one of aspects 224 to 239, wherein X^{15} is selected from L, T, M, and V.

[1451] Aspect 241. The IL-2Rα ligand of any one of aspects 224 to 240, wherein X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1452] Aspect 242. The IL-2Rα ligand of any one of aspects 224 to 241, wherein X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1453] Aspect 243. The IL-2Rα ligand of any one of aspects 224 to 242, wherein X^3 is selected from F, W, and Y.

[1454] Aspect 244. The IL-2Rα ligand of any one of aspects 224 to 243, wherein X^4 is C.

[1455] Aspect 245. The IL-2Rα ligand of any one of aspects 224 to 244, wherein X^5 is L.

[1456] Aspect 246. The IL-2Rα ligand of any one of aspects 224 to 245, wherein X^6 is selected from H, K, and R.

[1457] Aspect 247. The IL-2Rα ligand of any one of aspects 224 to 246, wherein X^7 is S.

[1458] Aspect 248. The IL-2Rα ligand of any one of aspects 224 to 247, wherein X^8 is selected from D and E.

[1459] Aspect 249. The IL-2Rα ligand of any one of aspects 224 to 248, wherein X^9 is P.

[1460] Aspect 250. The IL-2Rα ligand of any one of aspects 224 to 249, wherein X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1461] Aspect 251. The IL-2Rα ligand of any one of aspects 224 to 250, wherein X^{11} is A.

[1462] Aspect 252. The IL-2Rα ligand of any one of aspects 224 to 251, wherein X^{12} is C.

[1463] Aspect 253. The IL-2Rα ligand of any one of aspects 224 to 252, wherein X^{13} is selected from F, W, and Y.

[1464] Aspect 254. The IL-2Rα ligand of any one of aspects 224 to 252, wherein X^{13} is W.

[1465] Aspect 255. The IL-2Rα ligand of any one of aspects 224 to 254, wherein X^{14} is S.

[1466] Aspect 256. The IL-2Rα ligand of any one of aspects 224 to 255, wherein X^{15} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1467] Aspect 257. The IL-2Rα ligand of aspect 224, wherein X^4 is C, X^5 is L, X^7 is S, X^8 is E, X^9 is P, X^{11} is A, X^{12} is C, X^{12} is W, and X^{14} is S.

[1468] Aspect 258. The IL-2Rα ligand of aspect 224, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 is selected from F, H, I, L, M, V, W, and Y;

X^4 is C;

X^5 is L;

X^6 is selected from H, K, and R;

X^7 is S;

X^8 is E;

X^9 is P;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is A;

X^{12} is C;

X^{13} is W;

X^{14} is S; and

X^{15} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1469] Aspect 259. The IL-2Rα ligand of aspect 224, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 50 to SEQ ID NO: 54:

SEQ ID NO: 50	E	Q	F	C	L	V	S	D	P	M	A	C	W	S	L
SEQ ID NO: 51	K	Y	W	C	L	R	S	E	P	D	A	C	F	A	T
SEQ ID NO: 52	R	V	Y	C	L	A	S	E	P	N	S	C	W	S	T
SEQ ID NO: 53	T	K	L	C	L	K	S	E	P	Q	A	C	W	S	M
SEQ ID NO: 54	I	R	F	C	L	R	S	E	P	T	A	C	W	I	V

[1470] Aspect 260. The IL-2Rα ligand of any one of aspects 224 to 259, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1471] Aspect 261. The IL-2Rα ligand of any one of aspects 259 to 260, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1472] Aspect 262. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (7a) (SEQ ID NO: 55), the amino acid sequence of Formula (7b) (SEQ ID NO: 56), the amino acid sequence of Formula (7c) (SEQ ID NO: 57), or the amino acid sequence of Formula (7d) (SEQ ID NO: 58):

$$–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}— \quad (7a)$$

$$–X^3–C–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–C–X^{13}– \quad (7b)$$

$$–X^2–X^3–C–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–C–X^{13}–X^{14}– \quad (7c)$$

$$–X^1–X^2–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–X^{13}–X^{14}–X^{15}– \quad (7d)$$

wherein,

X^1 is selected from a basic amino acid;

X^2 is selected from a basic amino acid;

X^3 is selected from an amino acid comprising a large hydrophobic side chain;

X^4 is C;

X^5 is selected from an amino acid comprising a large hydrophobic side chain;

X^6 is selected from an amino acid comprising a basic side chain;

X^7 is selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain;

X^8 is selected from an amino acid comprising a large hydrophobic side chain;

X^9 is selected from an amino acid comprising a small hydrophobic side chain;

X^{10} is selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain;

X^{11} is selected from an amino acid comprising a small hydrophobic side chain;

X^{12} is C;

X^{13} is selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^{14} is selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain; and

X^{15} is selected from an amino acid comprising a large hydrophobic side chain.

[1473] Aspect 263. The IL-2Rα ligand of aspect 262, wherein,

X^1 is selected from K, and R;

X^2 is selected from H, K, and R;

X^3 is selected from F, I, L, M, V, W, and Y;

X^4 is C;

X^5 is selected from F, I, L, M, V, W, and Y;

X^6 is selected from H, K, and R;

X^7 is selected from A, G, H, N, P, Q, S, T, and Y;

X^8 is selected from F, I, L, M, V, W, and Y;

X^9 is selected from A, G, P, S, and T;

X^{10} is selected from A, G, H, N, P, Q, S, T, and Y;

X^{11} is selected from A, G, P, S, and T;

X^{12} is C;

X^{13} is selected from F, H, I, L, M, V, W, and Y;

X^{14} is selected from A, G, H, N, P, Q, S, T, and Y; and

X^{15} is selected from F, I, L, M, V, W, and Y.

[1474] Aspect 264. The IL-2Rα ligand of any one of aspects 262 to 263, wherein X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1475] Aspect 265. The IL-2Rα ligand of any one of aspects 262 to 264, wherein X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1476] Aspect 266. The IL-2Rα ligand of any one of aspects 262 to 265, wherein X^3 is selected from F, I, L, M, V, W, and Y.

[1477] Aspect 267. The IL-2Rα ligand of any one of aspects 262 to 266, wherein X^4 is C.

[1478] Aspect 268. The IL-2Rα ligand of any one of aspects 262 to 267, wherein X^5 is selected from F, I, L, M, V, W, and Y.

[1479] Aspect 269. The IL-2Rα ligand of any one of aspects 262 to 268, wherein X^5 is L.

[1480] Aspect 270. The IL-2Rα ligand of any one of aspects 262 to 269, wherein X^6 is selected from H, K, and R.

[1481] Aspect 271. The IL-2Rα ligand of any one of aspects 262 to 270, wherein X^7 is selected from A, G, P, S, and T.

[1482] Aspect 272. The IL-2Rα ligand of any one of aspects 262 to 271, wherein X^7 is selected from H, N, Q, S, T, and Y.

[1483] Aspect 273. The IL-2Rα ligand of any one of aspects 262 to 272, wherein X^7 is S.

[1484] Aspect 274. The IL-2Rα ligand of any one of aspects 262 to 273, wherein X^8 is selected from D and E.

[1485] Aspect 275. The IL-2Rα ligand of any one of aspects 262 to 274, wherein X^9 is P.

[1486] Aspect 276. The IL-2Rα ligand of any one of aspects 262 to 275, wherein X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1487] Aspect 277. The IL-2Rα ligand of any one of aspects 262 to 276, wherein X^{11} is A.

[1488] Aspect 278. The IL-2Rα ligand of any one of aspects 262 to 277, wherein X^{12} is C.

[1489] Aspect 279. The IL-2Rα ligand of any one of aspects 262 to 278, wherein X^{13} is W.

[1490] Aspect 280. The IL-2Rα ligand of any one of aspects 262 to 279, wherein X^{14} is S.

[1491] Aspect 281. The IL-2Rα ligand of any one of aspects 262 to 280, wherein X^{15} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1492] Aspect 282. The IL-2Rα ligand of any one of aspects 262 to 281, wherein X^{1} is R.

[1493] Aspect 283. The IL-2Rα ligand of any one of aspects 262 to 282, wherein X^{2} is R.

[1494] Aspect 284. The IL-2Rα ligand of any one of aspects 262 to 283, wherein X^{3} is F.

[1495] Aspect 285. The IL-2Rα ligand of any one of aspects 262 to 284, wherein X^{4} is C.

[1496] Aspect 286. The IL-2Rα ligand of any one of aspects 262 to 285, wherein X^{5} is L.

[1497] Aspect 287. The IL-2Rα ligand of any one of aspects 262 to 286, wherein X^{6} is R.

[1498] Aspect 288. The IL-2Rα ligand of any one of aspects 262 to 287, wherein X^{7} is S.

[1499] Aspect 289. The IL-2Rα ligand of any one of aspects 262 to 288, wherein X^{8} is E.

[1500] Aspect 290. The IL-2Rα ligand of any one of aspects 262 to 289, wherein X^{9} is P.

[1501] Aspect 291. The IL-2Rα ligand of any one of aspects 262 to 290, wherein X^{10} is T.

[1502] Aspect 292. The IL-2Rα ligand of any one of aspects 262 to 291, wherein X^{11} is A.

[1503] Aspect 293. The IL-2Rα ligand of any one of aspects 262 to 292, wherein X^{12} is C.

[1504] Aspect 294. The IL-2Rα ligand of any one of aspects 262 to 293, wherein X^{13} is W.

[1505] Aspect 295. The IL-2Rα ligand of any one of aspects 262 to 294, wherein X^{14} is T.

[1506] Aspect 296. The IL-2Rα ligand of any one of aspects 262 to 295, wherein X^{15} is V.

[1507] Aspect 297. The IL-2Rα ligand of aspect 262, wherein X^{1} is R, X^{2} is R, X^{3} is F, X^{4} is C, X^{5} is L, X^{6}, is R, X^{7} is S, X^{8} is E, X^{9} is P, X^{10} is T, X^{11} is A, X^{12} is C, X^{13} is W, and X^{15} is V.

[1508] Aspect 298. The IL-2Rα ligand of aspect 262, wherein,

X^{1} is selected from K and R;

X^{2} is R;

X^{3} is F;

X^{4} is C;

X^{5} is L;

X^{6} is R;

X^{7} is S;

X^{8} is E;

X^{9} is P;

X^{10} is T;

X^{11} is A;

X^{12} is C;

X^{13} is W;

X^{14} is T; and

X^{15} is V.

[1509] Aspect 299. The IL-2Rα ligand of aspect 262, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 59 to SEQ ID NO: 68:

SEQ ID NO: 59	R	R	F	C	L	R	S	E	P	T	A	C	W	I	V
SEQ ID NO: 60	K	L	F	C	L	R	S	G	D	R	A	C	W	V	V
SEQ ID NO: 61	M	R	F	C	L	R	S	E	P	T	A	C	W	T	V
SEQ ID NO: 62	R	R	F	C	L	R	S	E	P	T	A	C	W	D	V
SEQ ID NO: 63	R	R	F	C	L	R	S	D	P	T	A	C	W	I	V
SEQ ID NO: 64	K	R	F	C	L	R	S	E	P	T	A	C	W	T	V
SEQ ID NO: 65	R	R	F	C	L	R	S	E	P	M	A	C	W	T	V
SEQ ID NO: 66	R	R	F	C	L	R	S	E	P	T	A	C	W	T	V
SEQ ID NO: 67	R	R	F	C	L	R	S	E	P	A	A	C	W	F	V
SEQ ID NO: 68	R	R	F	C	L	R	S	E	P	T	A	C	W	Y	V

[1510] Aspect 300. The IL-2Rα ligand of any one of aspects 262 to 299, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1511] Aspect 301. The IL-2Rα ligand of any one of aspects 299 to 300, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1512] Aspect 302. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (8a) (SEQ ID NO: 69), the amino acid sequence of Formula (8b) (SEQ ID NO: 70), or the amino acid sequence of Formula (8c) (SEQ ID NO: 71):

$$-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}- \quad (8a)$$

$$-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-C-X^{13}- \quad (8b)$$

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-X^{14}- \quad (8c)$$

wherein,

X^1 is selected from an amino acid;

X^2 is selected from an amino acid comprising a basic side chain;

X^3 is C;

X^4 is selected from an amino acid comprising a large hydrophobic side chain or a basic side chain;

X^5 is selected from an amino acid;

X^6 is selected from an amino acid comprising an acidic side chain;

X^7 is selected from an amino acid;

X^8 is selected from an amino acid;

X^9 is selected from an amino acid;

X^{10} is selected from an amino acid comprising a small hydrophobic side chain;

X^{11} is selected from an amino acid;

X^{12} is C;

X^{13} is selected from an amino acid comprising a large hydrophobic side chain; and

X^{14} is selected from an amino acid comprising a large hydrophobic side chain.

[1513] Aspect 303. The IL-2Rα ligand of aspect 302, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from H, K, and R;

X^3 is C;

X^4 is selected from F, H, I, K, L, M, R, V, W, and Y;

X^5 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^6 is selected from D and E;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} is selected from A, G, P, S, and T;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} is C;

X^{13} is selected from F, I, L, M, V, W, and Y; and

X^{14} is selected from F, I, L, M, V, W, and Y.

[1514] Aspect 304. The IL-2Rα ligand of any one of aspects 302 to 303, wherein X^1 is selected from R, I, L, M, N, S. T, V, and D.

[1515] Aspect 305. The IL-2Rα ligand of any one of aspects 302 to 304, wherein X^2 is selected from S, K, R, H, G, and F.

[1516] Aspect 306. The IL-2Rα ligand of any one of aspects 302 to 305, wherein X^3 is C.

[1517] Aspect 307. The IL-2Rα ligand of any one of aspects 302 to 306, wherein X^4 is selected from N, R, I, T, V, L, and D.

[1518] Aspect 308. The IL-2Rα ligand of any one of aspects 302 to 307, wherein X^5 is selected from R, V, L, M, V, G, Y, I, F, and T.

[1519] Aspect 309. The IL-2Rα ligand of any one of aspects 302 to 308, wherein X^5 is selected from Y, L, E, D, S, I, Y, D, and R.

[1520] Aspect 310. The IL-2Rα ligand of any one of aspects 302 to 308, wherein X^6 is selected from Y, L, E, D, S, and R.

[1521] Aspect 311. The IL-2Rα ligand of any one of aspects 302 to 310, wherein X^7 is selected from G, E, K, T, P, W, L, Y, G, S, and R.

[1522] Aspect 312. The IL-2Rα ligand of any one of aspects 302 to 311, wherein X^8 is selected from I, A, Q, R, S R, L, N, P, A, I, R, D, and W.

[1523] Aspect 313. The IL-2Rα ligand of any one of aspects 302 to 312, wherein X^9 is selected from W, G, S, D, R, L, F, P, A, and T.

[1524] Aspect 314. The IL-2Rα ligand of any one of aspects 302 to 313, wherein X^{10} is selected from G, T, E, W, Q, R, and Y.

[1525] Aspect 315. The IL-2Rα ligand of any one of aspects 302 to 314, wherein X^{11} is selected from H, P, I, T, H, A, S, F, and Y.

[1526] Aspect 316. The IL-2Rα ligand of any one of aspects 302 to 315, wherein X^{12} is C.

[1527] Aspect 317. The IL-2Rα ligand of any one of aspects 302 to 316, wherein X^{13} is selected from D, V, L, I, Y, I, R, H, T, I, and W.

[1528] Aspect 318. The IL-2Rα ligand of any one of aspects 302 to 317, wherein X^{14} is selected from T, S, F, and I.

[1529] Aspect 319. The IL-2Rα ligand of any one of aspects 302 to 318, wherein X^1 is selected from R, I, L, M, N, S. T, V, and D.

[1530] Aspect 320. The IL-2Rα ligand of any one of aspects 302 to 319, wherein X^2 is selected from S, K, R, H, G, and F.

[1531] Aspect 321. The IL-2Rα ligand of any one of aspects 302 to 320, wherein X^3 is C.

[1532] Aspect 322. The IL-2Rα ligand of any one of aspects 302 to 321, wherein X^4 is selected from F, I, L, M, V, W, and Y.

[1533] Aspect 323. The IL-2Rα ligand of any one of aspects 302 to 321, wherein X^4 is selected from H, K, and R.

[1534] Aspect 324. The IL-2Rα ligand of any one of aspects 302 to 323, wherein X^5 is selected from Y, L, E, D, S, I, Y, D, and R.

[1535] Aspect 325. The IL-2Rα ligand of any one of aspects 302 to 324, wherein X^6 is selected from Y, L, E, D, S, and R.

[1536] Aspect 326. The IL-2Rα ligand of any one of aspects 302 to 324, wherein X^6 is selected from D and E.

[1537] Aspect 327. The IL-2Rα ligand of any one of aspects 302 to 326, wherein X^7 is selected from G, E, K, T, P, W, L, Y, G, S, and R.

[1538] Aspect 328. The IL-2Rα ligand of any one of aspects 302 to 327, wherein X^8 is selected from I, A, Q, R, S R, L, N, P, A, I, R, D, and W.

[1539] Aspect 329. The IL-2Rα ligand of any one of aspects 302 to 328, wherein X^9 is selected from W, G, S, D, R, L, F, P, A, and T.

[1540] Aspect 330. The IL-2Rα ligand of any one of aspects 302 to 329, wherein X^{10} is selected from G, T, E, W, Q, R, and Y.

[1541] Aspect 331. The IL-2Rα ligand of any one of aspects 302 to 329, wherein X^{10} is G.

[1542] Aspect 332. The IL-2Rα ligand of any one of aspects 302 to 331, wherein X^{11} is selected from H, P, I, T, H, A, S, F, and Y.

[1543] Aspect 333. The IL-2Rα ligand of any one of aspects 302 to 332, wherein X^{12} is C.

[1544] Aspect 334. The IL-2Rα ligand of any one of aspects 302 to 333, wherein X^{13} is selected from F, I, L, M, V, W, and Y.

[1545] Aspect 335. The IL-2Rα ligand of any one of aspects 302 to 334, wherein X^{14} is F.

[1546] Aspect 336. The IL-2Rα ligand of aspect 302, wherein X^2 is R, X^3 is C, X^6, is D, X^{10} is G, X^{12} is C, and X^{14} is F.

[1547] Aspect 337. The IL-2Rα ligand of aspect 302, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is R;

X^3 is C;

X^4 is selected from F, H, I, K, L, M, R, V, W, and Y;

X^5 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^6 is D;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} is G;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} is C;

X^{13} is selected from F, I, L, M, V, W, and Y; and

X^{14} is F.

[1548] Aspect 338. The IL-2Rα ligand of aspect 302, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 72 to SEQ ID NO: 86:

SEQ ID NO: 72	R	S	C	N	R	Y	G	I	W	G	H	C	D	T
SEQ ID NO: 73	I	K	C	R	V	L	E	A	G	T	P	C	V	F
SEQ ID NO: 74	I	R	C	R	Y	E	K	Q	S	G	I	C	L	F
SEQ ID NO: 75	L	R	C	R	L	D	T	R	D	G	T	C	R	F
SEQ ID NO: 76	M	R	C	I	L	S	P	S	R	E	H	C	L	F
SEQ ID NO: 77	N	H	C	T	M	D	W	R	L	G	A	C	I	F
SEQ ID NO: 78	S	G	C	R	L	S	L	L	D	G	H	C	Y	F
SEQ ID NO: 79	S	K	C	V	Y	D	Y	N	F	G	T	C	I	F
SEQ ID NO: 80	S	R	C	V	M	S	L	Q	L	G	A	C	I	F
SEQ ID NO: 81	T	R	C	T	V	I	G	P	P	W	S	C	R	F
SEQ ID NO: 82	V	F	C	I	G	Y	G	A	A	Q	S	C	H	S
SEQ ID NO: 83	V	R	C	L	Y	D	S	I	T	R	T	C	T	F
SEQ ID NO: 84	V	S	C	K	I	D	R	R	S	G	S	C	L	F
SEQ ID NO: 85	V	S	C	R	F	R	P	D	L	G	F	C	I	F

SEQ ID NO: 86 D R C D T R T W G Y Y C W I

[1549] Aspect 339. The IL-2Rα ligand of any one of aspects 302 to 338, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1550] Aspect 340. The IL-2Rα ligand of any one of aspects 338 to 339, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1551] Aspect 341. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (9a) (SEQ ID NO: 87), the amino acid sequence of Formula (9b) (SEQ ID NO: 88), the amino acid sequence of Formula (9c) (SEQ ID NO: 89), or the amino acid sequence of Formula (9d) (SEQ ID NO: 90):

$$-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (9a)$$

$$-X^3-C-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}- \quad (9b)$$

$$-X^2-X^3-C-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}-X^{15}- \quad (9c)$$

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-X^{14}-X^{15}-X^{16}- \quad (9d)$$

wherein,

X^1 is selected from an amino acid;

X^2 is selected from an amino acid comprising a large hydrophobic side chain;

X^3 is selected from an amino acid comprising a large hydrophobic side chain or an acidic side chain;

X^4 is C;

X^5 is selected from an amino acid comprising a large hydrophobic side chain or a basic side chain;

X^6 is selected from an amino acid comprising a large hydrophobic side chain;

X^7 is selected from an amino acid;

X^8 is selected from an amino acid comprising a small hydrophobic side chain;

X^9 is selected from an amino acid comprising a small hydrophobic side chain;

X^{10} is selected from an amino acid comprising a large hydrophobic side chain or a basic side chain;

X^{11} is selected from an amino acid comprising a basic side chain or an acidic side chain;

X^{12} is selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain;

X^{13} is C;

X^{14} is selected from an amino acid;

X^{15} is selected from an amino acid; and

X^{16} is selected from an amino acid.

[1552] Aspect 342. The IL-2Rα ligand of aspect 341, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from F, I, L, M, V, W, and Y;

X^3 is selected from D, E, F, I, L, M, V, W, and Y;

X^4 is C;

X^5 is selected from F, H, I, K, L, M, R, V, W, and Y;

X^6 is selected from F, I, L, M, V, W, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is selected from A, G, P, S, and T;

X^9 is selected from A, G, P, S, and T;

X^{10} is selected from F, H, I, K, L, M, R, V, W, and Y;

X^{11} is selected from D, E, H, K, and R;

X^{12} is selected from A, G, H, N, P, Q, S, T, and Y;

X^{13} is C;

X^{14} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{15} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y; and

X^{16} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1553] Aspect 343. The IL-2Rα ligand of any one of aspects 341 to 342, wherein X^1 is selected from G, E, F, K, P, Q, R, S, and V.

[1554] Aspect 344. The IL-2Rα ligand of any one of aspects 341 to 343, wherein X^2 is selected from S, W, I, F, L, and R.

[1555] Aspect 345. The IL-2Rα ligand of any one of aspects 341 to 344, wherein X^3 is selected from R, E, I, V, S, N, F, L, and M.

[1556] Aspect 346. The IL-2Rα ligand of any one of aspects 341 to 345, wherein X^4 is C.

[1557] Aspect 347. The IL-2Rα ligand of any one of aspects 341 to 346, wherein X^5 is selected from Y, R, V, T, E, I, and K.

[1558] Aspect 348. The IL-2Rα ligand of any one of aspects 341 to 347, wherein X^6 is selected from W, F, Y, L, H, I, T, S, and V.

[1559] Aspect 349. The IL-2Rα ligand of any one of aspects 341 to 348, wherein X^7 is selected from D, L, S, D, V, Y, S, Q, I, R, M, G, and A.

[1560] Aspect 350. The IL-2Rα ligand of any one of aspects 341 to 349, wherein X^8 is P.

[1561] Aspect 351. The IL-2Rα ligand of any one of aspects 341 to 350, wherein X^9 is G.

[1562] Aspect 352. The IL-2Rα ligand of any one of aspects 341 to 351, wherein X^{10} is selected from R, S, T, N, R, V, L, H, W, and Y.

[1563] Aspect 353. The IL-2Rα ligand of any one of aspects 341 to 352, wherein X^{11} is selected from E, R, H, G, E, K, Q, and V.

[1564] Aspect 354. The IL-2Rα ligand of any one of aspects 341 to 353, wherein X^{12} is selected from V, G, S, A, and W.

[1565] Aspect 355. The IL-2Rα ligand of any one of aspects 341 to 354, wherein X^{13} is C.

[1566] Aspect 356. The IL-2Rα ligand of any one of aspects 341 to 355, wherein X^{14} is selected from I, S, R, W, H, V, K, T, R, G, and P.

[1567] Aspect 357. The IL-2Rα ligand of any one of aspects 341 to 356, wherein X^{15} is selected from F, L, M, S, W, T, A, and R.

[1568] Aspect 358. The IL-2Rα ligand of any one of aspects 341 to 357, wherein X^{16} is selected from K, F, V, I, F, M, L, Q, T, and N.

[1569] Aspect 359. The IL-2Rα ligand of any one of aspects 341 to 358, wherein X^{1} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1570] Aspect 360. The IL-2Rα ligand of any one of aspects 341 to 359, wherein X^{2} is selected from F, W, and Y.

[1571] Aspect 361. The IL-2Rα ligand of any one of aspects 341 to 360, wherein X^{3} is W.

[1572] Aspect 362. The IL-2Rα ligand of any one of aspects 341 to 361, wherein X^{4} is C.

[1573] Aspect 363. The IL-2Rα ligand of any one of aspects 341 to 362, wherein X^{5} is selected from F, I, L, M, V, W, and Y.

[1574] Aspect 364. The IL-2Rα ligand of any one of aspects 341 to 362, wherein X^{5} is selected from D and E.

[1575] Aspect 365. The IL-2Rα ligand of any one of aspects 341 to 364, wherein X^{6} is selected from F, I, L, M, V, W, and Y.

[1576] Aspect 366. The IL-2Rα ligand of any one of aspects 341 to 364, wherein X^{6} is selected from F, W, and Y.

[1577] Aspect 367. The IL-2Rα ligand of any one of aspects 341 to 366, wherein X^{7} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1578] Aspect 368. The IL-2Rα ligand of any one of aspects 341 to 367, wherein X^{8} is P.

[1579] Aspect 369. The IL-2Rα ligand of any one of aspects 341 to 368, wherein X^{9} is G.

[1580] Aspect 370. The IL-2Rα ligand of any one of aspects 341 to 369, wherein X^{10} is selected from F, I, L, M, V, W, and Y.

[1581] Aspect 371. The IL-2Rα ligand of any one of aspects 341 to 369, wherein X^{10} is selected from F, W, and Y.

[1582] Aspect 372. The IL-2Rα ligand of any one of aspects 341 to 371, wherein X^{10} is selected from H, K, and R.

[1583] Aspect 373. The IL-2Rα ligand of any one of aspects 341 to 372, wherein X^{11} is selected from H, K, and R.

[1584] Aspect 374. The IL-2Rα ligand of any one of aspects 341 to 372, wherein X^{11} is selected from D and E.

[1585] Aspect 375. The IL-2Rα ligand of any one of aspects 341 to 374, wherein X^{12} is selected from A, G, P, S, and T.

[1586] Aspect 376. The IL-2Rα ligand of any one of aspects 341 to 374, wherein X^{12} is selected from N, Q, S, T, and Y.

[1587] Aspect 377. The IL-2Rα ligand of any one of aspects 341 to 376, wherein X^{13} is C.

[1588] Aspect 378. The IL-2Rα ligand of any one of aspects 341 to 377, wherein X^{14} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1589] Aspect 379. The IL-2Rα ligand of any one of aspects 341 to 378, wherein X^{15} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1590] Aspect 380. The IL-2Rα ligand of any one of aspects 341 to 379, wherein X^{16} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1591] Aspect 381. The IL-2Rα ligand of any one of aspects 341 to 379, wherein X^{16} is selected from F, I, L, M, V, W, and Y.

[1592] Aspect 382. The IL-2Rα ligand of any one of aspects 341 to 379, wherein X^{16} is selected from F, W, and Y.

[1593] Aspect 383. The IL-2Rα ligand of aspect 341, wherein X^2 is W, X^3 is E, X^4 is C, X^5, is R, X^8 is P, X^9 is G, X^{10} is R, X^{11} is R, X^{12} is G, and X^{13} is C.

[1594] Aspect 384. The IL-2Rα ligand of aspect 341, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is W;

X^3 is E;

X^4 is C;

X^5 is R;

X^6 is selected from F, H, I, L, M, V, W, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is P;

X^9 is G

X^{10} is R;

X^{11} is R;

X^{12} is G;

X^{13} is C;

X^{14} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{15} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y; and

X^{16} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1595] Aspect 385. The IL-2Rα ligand of aspect 341, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 91 to SEQ ID NO: 104:

SEQ ID NO: 91	G	S	R	C	Y	W	D	P	G	R	E	V	C	I	F	K
SEQ ID NO: 92	E	W	E	C	R	F	L	P	G	R	R	G	C	S	L	F
SEQ ID NO: 93	F	W	E	C	V	Y	S	P	G	S	R	G	C	R	M	V
SEQ ID NO: 94	G	F	R	C	T	Y	D	P	G	T	H	S	C	W	S	I
SEQ ID NO: 95	K	W	I	C	R	L	V	P	G	N	G	A	C	H	S	F
SEQ ID NO: 96	P	W	V	C	E	H	Y	P	G	R	R	G	C	V	L	M
SEQ ID NO: 97	Q	W	S	C	V	F	S	P	G	V	R	G	C	K	L	V
SEQ ID NO: 98	R	F	I	C	R	I	Q	P	G	R	E	G	C	W	S	L
SEQ ID NO: 99	R	W	E	C	I	Y	I	P	G	R	K	G	C	T	L	Q
SEQ ID NO: 100	S	L	N	C	K	T	R	P	G	L	R	W	C	T	W	T
SEQ ID NO: 101	S	W	E	C	V	Y	M	P	G	H	Q	G	C	R	L	F
SEQ ID NO: 102	V	R	F	C	R	S	G	P	G	W	V	S	C	G	T	Q
SEQ ID NO: 103	V	R	L	C	R	V	G	P	G	Y	E	S	C	P	A	N
SEQ ID NO: 104	V	R	M	C	Y	V	A	P	G	Y	V	S	C	P	R	M

[1596] Aspect 386. The IL-2Rα ligand of any one of aspects 341 to 385, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1597] Aspect 387. The IL-2Rα ligand of any one of aspects 385 to 386, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1598] Aspect 388. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (10a) (SEQ ID NO: 105), the amino acid sequence of Formula (10b) (SEQ ID NO: 106), the amino acid sequence of Formula (10c) (SEQ ID NO: 107), or the amino acid sequence of Formula (10d) (SEQ ID NO: 108):

$$-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (10a)$$

$$-X^3-C-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}- \quad (10b)$$

$$-X^2-X^3-C-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}-X^{15}- \quad (10c)$$

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-X^{14}-X^{15}-X^{16}- \quad (10d)$$

wherein,

X^1 is selected from an amino acid comprising an acidic side chain;

X^2 is selected from an amino acid comprising a large hydrophobic side chain;

X^3 is selected from an amino acid comprising an acidic side chain;

X^4 is C;

X^5 is selected from an amino acid comprising a large hydrophobic side chain;

X^6 is selected from an amino acid comprising a large hydrophobic side chain;

X^7 is selected from an amino acid comprising a large hydrophobic side chain;

X^8 is selected from an amino acid comprising a small hydrophobic side chain;

X^9 is selected from an amino acid comprising a small hydrophobic side chain;

X^{10} is selected from an amino acid comprising a basic side chain;

X^{11} is selected from an amino acid comprising a basic side chain;

X^{12} is selected from an amino acid comprising a small hydrophobic side chain;

X^{13} is C;

X^{14} is selected from an amino acid comprising a small hydrophobic side chain or a polar neutral side chain;

X^{14} is selected from an amino acid comprising a large hydrophobic side chain; and

X^{15} is selected from an amino acid comprising a large hydrophobic side chain.

[1599] Aspect 389. The IL-2Rα ligand of aspect 388, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from F, I, L, M, V, W, and Y;

X^3 is selected from D and E;

X^4 is C;

X^5 is selected from F, I, L, M, V, W, and Y;

X^6 is selected from F, I, L, M, V, W, and Y;

X^7 is selected from F, I, L, M, V, W, and Y;

X^8 is selected from A, G, P, S, and T;

X^9 is selected from A, G, P, S, and T;

X^{10} is selected from H, K, and R;

X^{11} is selected from H, K, and R;

X^{12} is selected from A, G, P, S, and T;

X^{13} is C;

X^{14} is selected from A, G, H, N, P, Q, S, T, and Y;

X^{15} is selected from F, I, L, M, V, W, and Y; and

X^{16} is selected from F, I, L, M, V, W, and Y.

[1600] Aspect 390. The IL-2Rα ligand of any one of aspects 388 to 389, wherein X^1 is selected from N, D, E, A, V, and T.

[1601] Aspect 391. The IL-2Rα ligand of any one of aspects 388 to 390, wherein X^2 is selected from W and Y.

[1602] Aspect 392. The IL-2Rα ligand of any one of aspects 388 to 391, wherein X^3 is selected from E, H, and D.

[1603] Aspect 393. The IL-2Rα ligand of any one of aspects 388 to 392, wherein X^4 is C.

[1604] Aspect 394. The IL-2Rα ligand of any one of aspects 388 to 393, wherein X^5 is selected from I, l, W, and V.

[1605] Aspect 395. The IL-2Rα ligand of any one of aspects 388 to 394, wherein X^6 is selected from F and I.

[1606] Aspect 396. The IL-2Rα ligand of any one of aspects 388 to 395, wherein X^7 is selected from S, L, and M.

[1607] Aspect 397. The IL-2Rα ligand of any one of aspects 388 to 396, wherein X^8 is P.

[1608] Aspect 398. The IL-2Rα ligand of any one of aspects 388 to 397, wherein X^9 is G.

[1609] Aspect 399. The IL-2Rα ligand of any one of aspects 388 to 398, wherein X^{10} is selected from R and H.

[1610] Aspect 400. The IL-2Rα ligand of any one of aspects 388 to 399, wherein X^{11} is selected from R and K.

[1611] Aspect 401. The IL-2Rα ligand of any one of aspects 388 to 400, wherein X^{12} is G.

[1612] Aspect 402. The IL-2Rα ligand of any one of aspects 388 to 401, wherein X^{13} is C.

[1613] Aspect 403. The IL-2Rα ligand of any one of aspects 388 to 402, wherein X^{14} is selected from S, L, T, and F.

[1614] Aspect 404. The IL-2Rα ligand of any one of aspects 388 to 403, wherein X^{15} is selected from L and G.

[1615] Aspect 405. The IL-2Rα ligand of any one of aspects 388 to 404, wherein X^{16} is selected from F, M, T, and I.

[1616] Aspect 406. The IL-2Rα ligand of any one of aspects 388 to 405, wherein X^1 is selected from D and E.

[1617] Aspect 407. The IL-2Rα ligand of any one of aspects 388 to 406, wherein X^2 is W.

[1618] Aspect 408. The IL-2Rα ligand of any one of aspects 388 to 407, wherein X^3 is selected from D and E.

[1619] Aspect 409. The IL-2Rα ligand of any one of aspects 388 to 408, wherein X^4 is C.

[1620] Aspect 410. The IL-2Rα ligand of any one of aspects 388 to 409, wherein X^5 is selected from F, I, L, M, V, W, and Y.

[1621] Aspect 411. The IL-2Rα ligand of any one of aspects 388 to 409, wherein X^5 is selected from I and L.

[1622] Aspect 412. The IL-2Rα ligand of any one of aspects 388 to 411, wherein X^6 is F.

[1623] Aspect 413. The IL-2Rα ligand of any one of aspects 388 to 412, wherein X^7 is selected from L and M.

[1624] Aspect 414. The IL-2Rα ligand of any one of aspects 388 to 413, wherein X^8 is P.

[1625] Aspect 415. The IL-2Rα ligand of any one of aspects 388 to 414, wherein X^9 is G.

[1626] Aspect 416. The IL-2Rα ligand of any one of aspects 388 to 415, wherein X^{10} is selected from H and R.

[1627] Aspect 417. The IL-2Rα ligand of any one of aspects 388 to 416, wherein X^{11} is selected from K and R.

[1628] Aspect 418. The IL-2Rα ligand of any one of aspects 388 to 417, wherein X^{12} is G.

[1629] Aspect 419. The IL-2Rα ligand of any one of aspects 388 to 418, wherein X^{13} is C.

[1630] Aspect 420. The IL-2Rα ligand of any one of aspects 388 to 419, wherein X^{14} is selected from S and T.

[1631] Aspect 421. The IL-2Rα ligand of any one of aspects 388 to 420, wherein X^{15} is L.

[1632] Aspect 422. The IL-2Rα ligand of any one of aspects 388 to 421, wherein X^{16} is selected from F and M.

[1633] Aspect 423. The IL-2Rα ligand of aspect 388, wherein,

X^1 is D;

X^2 is W;

X^3 is E;

X^4 is C;

X^5 is L;

X^6 is F;

X^7 is L;

X^8 is P;

X^9 is G;

X^{10} is selected from H and R;

X^{11} is selected from K and R;

X^{12} is G;

X^{13} is C;

X^{14} is T;

X^{15} is L; and

X^{16} is F.

[1634] Aspect 424. The IL-2Rα ligand of aspect 388, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 109 to SEQ ID NO: 121:

SEQ ID NO: 109	N	W	E	C	I	F	S	P	G	R	R	G	C	S	L	T
SEQ ID NO: 110	D	W	E	C	L	F	L	P	G	R	R	G	C	L	L	F
SEQ ID NO: 111	E	W	E	C	L	F	M	P	G	R	R	G	C	L	L	M
SEQ ID NO: 112	A	W	E	C	L	F	L	P	G	H	R	G	C	S	L	F
SEQ ID NO: 113	E	W	E	C	L	F	L	P	G	R	K	G	C	T	L	F
SEQ ID NO: 114	D	W	E	C	I	F	L	P	G	R	R	G	C	T	L	F
SEQ ID NO: 115	V	Y	E	C	L	F	M	P	G	R	K	G	C	F	G	M

SEQ ID NO: 116	E	W	E	C	W	F	L	P	G	R	R	G	C	T	L	I
SEQ ID NO: 117	D	W	H	C	L	F	L	P	G	H	R	G	C	T	L	F
SEQ ID NO: 118	D	W	E	C	L	F	L	P	G	R	R	G	C	T	L	F
SEQ ID NO: 119	Y	W	E	C	V	F	M	P	G	H	R	G	C	S	L	I
SEQ ID NO: 120	T	W	D	C	L	F	L	P	G	R	R	G	C	T	L	M
SEQ ID NO: 121	N	W	E	C	I	F	S	P	G	R	R	G	C	S	L	T

[1635] Aspect 425. The IL-2Rα ligand of any one of aspects 388 to 424, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1636] Aspect 426. The IL-2Rα ligand of any one of aspects 424 to 425, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1637] Aspect 427. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (11a) (SEQ ID NO: 122), the amino acid sequence of Formula (11b) (SEQ ID NO: 123), the amino acid sequence of Formula (11c) (SEQ ID NO: 124), or the amino acid sequence of Formula (11d) (SEQ ID NO: 125):

$$-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}— \quad (11a)$$

$$-X^3-C-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}- \quad (11b)$$

$$-X^2-X^3-C-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}-X^{15}- \quad (11c)$$

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-X^{14}-X^{15}-X^{16}- \quad (11d)$$

wherein,

X^1 is selected from an amino acid;

X^2 is selected from an amino acid;

X^3 is selected from an amino acid;

X^4 is C;

X^5 is selected from an amino acid comprising an acidic side chain;

X^6 is selected from an amino acid

X^7 is selected from an amino acid comprising an acidic side chain or an aromatic side chain;

X^8 is selected from an amino acid comprising a small hydrophobic side chain;

X^9 is selected from an amino acid comprising a small hydrophobic side chain;

X^{10} is selected from an amino acid comprising an aromatic chain;

X^{11} is selected from an amino acid;

X^{12} is selected from an amino acid;

X^{13} is C;

X^{14} is selected from an amino acid;

X^{15} is selected from an amino acid comprising a large hydrophobic side chain; and

X^{16} is selected from an amino acid comprising a large hydrophobic side chain.

[1638] Aspect 428. The IL-2Rα ligand of aspect 427, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^4 is C;

X^5 is selected from D and E;

X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 is selected from D, E, F, H, W, and Y;

X^8 is selected from A, G, P, S, and T;

X^9 is selected from A, G, P, S, and T;

X^{10} is selected from F, H, W, and Y;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y

X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} is C;

X^{14} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{15} is selected from F, I, L, M, V, W, and Y; and

X^{16} is selected from F, I, L, M, V, W, and Y.

[1639] Aspect 429. The IL-2Rα ligand of any one of aspects 427 to 428, wherein X^1 is selected from A, E, F, G, K, R, T, Y, and W.

[1640] Aspect 430. The IL-2Rα ligand of any one of aspects 427 to 429, wherein X^2 is selected from G, T, K, Q, S, L, Q, R, and A.

[1641] Aspect 431. The IL-2Rα ligand of any one of aspects 427 to 430, wherein X^3 is selected from F, Y, W, and H.

[1642] Aspect 432. The IL-2Rα ligand of any one of aspects 427 to 430, wherein X^3 is selected from G, W, P, L, R, F, M, V, S, and P.

[1643] Aspect 433. The IL-2Rα ligand of any one of aspects 427 to 432, wherein X^4 is C.

[1644] Aspect 434. The IL-2Rα ligand of any one of aspects 427 to 433, wherein X^5 is selected from K, D, Y, T, Y, Q, F, L, and S.

[1645] Aspect 435. The IL-2Rα ligand of any one of aspects 427 to 434, wherein X^6 is selected from L, D, F, Y, W, N, D, M, V, D, L, and Y.

[1646] Aspect 436. The IL-2Rα ligand of any one of aspects 427 to 435, wherein X^7 is selected from N, H, F, D, N, S, L, and Y.

[1647] Aspect 437. The IL-2Rα ligand of any one of aspects 427 to 436, wherein X^8 is P.

[1648] Aspect 438. The IL-2Rα ligand of any one of aspects 427 to 437, wherein X^9 is G.

[1649] Aspect 439. The IL-2Rα ligand of any one of aspects 427 to 438, wherein X^{10} is selected from T, H, L, S, Q, R, N, Y, W, V, S, and H.

[1650] Aspect 440. The IL-2Rα ligand of any one of aspects 427 to 439, wherein X^{11} is selected from Q, W, P, D, E, S, P, E, H, G, R, and G.

[1651] Aspect 441. The IL-2Rα ligand of any one of aspects 427 to 440, wherein X^{12} is selected from V, S, R, I, A, D, S, E, Y, and G.

[1652] Aspect 442. The IL-2Rα ligand of any one of aspects 427 to 441, wherein X^{13} is C.

[1653] Aspect 443. The IL-2Rα ligand of any one of aspects 427 to 442, wherein X^{14} is selected from S, E, T, V, I, D, Q, W, P, I, and Y.

[1654] Aspect 444. The IL-2Rα ligand of any one of aspects 427 to 443, wherein X^{15} is selected from F, M, W, I, V, T, N, L, and S.

[1655] Aspect 445. The IL-2Rα ligand of any one of aspects 427 to 444, wherein X^{16} is selected from Y, V, I, L, S, K, E, and R.

[1656] Aspect 446. The IL-2Rα ligand of any one of aspects 427 to 445, wherein X^4 is C.

[1657] Aspect 447. The IL-2Rα ligand of any one of aspects 427 to 446, wherein X^5 is D.

[1658] Aspect 448. The IL-2Rα ligand of any one of aspects 427 to 447, wherein X^7 is selected from D and H.

[1659] Aspect 449. The IL-2Rα ligand of any one of aspects 427 to 448, wherein X^8 is P.

[1660] Aspect 450. The IL-2Rα ligand of any one of aspects 427 to 449, wherein X^9 is G.

[1661] Aspect 451. The IL-2Rα ligand of any one of aspects 427 to 450, wherein X^{10} is selected from F, H, W, and Y.

[1662] Aspect 452. The IL-2Rα ligand of any one of aspects 427 to 451, wherein X^{13} is C.

[1663] Aspect 453. The IL-2Rα ligand of any one of aspects 427 to 452, wherein X^{15} is selected from F, M, I, W, V, and L.

[1664] Aspect 454. The IL-2Rα ligand of any one of aspects 427 to 453, wherein X^{16} is selected from Y, V, I, and L.

[1665] Aspect 455. The IL-2Rα ligand of aspect 427, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^4 is C;

X^5 is selected from D and E;

X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 is selected from D, E, H, F, W, and Y;

X^8 is P;

X^9 is G;

X^{10} is selected from H, F, W, and Y;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} is C;

X^{14} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{15} is selected from F, I, L, M, V, W, and Y; and

X^{16} is selected from F, I, L, M, V, W, and Y.

[1666] Aspect 456. The IL-2Rα ligand of aspect 427, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 126 to SEQ ID NO: 140:

SEQ ID NO: 126	A	G	W	C	K	L	N	P	G	T	Q	V	C	S	F	Y
SEQ ID NO: 127	E	T	P	C	D	L	H	P	G	H	W	S	C	S	M	V
SEQ ID NO: 128	F	F	L	C	D	D	F	P	G	L	P	R	C	E	W	I
SEQ ID NO: 129	G	L	R	C	Y	F	D	P	G	S	Q	I	C	T	F	L
SEQ ID NO: 130	G	Q	R	C	T	Y	D	P	G	Q	D	A	C	V	F	S
SEQ ID NO: 131	G	S	R	C	Y	W	D	P	G	R	E	V	C	I	F	K
SEQ ID NO: 132	K	L	W	C	Q	N	N	P	G	N	S	I	C	D	M	Y
SEQ ID NO: 133	K	S	W	C	F	D	H	P	G	Y	P	I	C	Q	F	Y
SEQ ID NO: 134	R	L	F	C	L	M	N	P	G	P	P	D	C	W	I	Y
SEQ ID NO: 135	R	Q	F	C	L	V	S	P	G	Y	E	D	C	W	F	V
SEQ ID NO: 136	T	R	M	C	F	D	D	P	G	W	H	S	C	P	V	V
SEQ ID NO: 137	T	R	W	C	S	L	H	P	G	V	G	E	C	V	T	L
SEQ ID NO: 138	T	T	V	C	D	Y	H	P	G	S	R	Y	C	I	N	E
SEQ ID NO: 139	Y	A	S	C	T	Y	L	P	G	H	R	G	C	T	L	V
SEQ ID NO: 140	W	L	P	C	D	D	Y	P	G	H	G	Y	C	Y	S	R

[1667] Aspect 457. The IL-2Rα ligand of any one of aspects 427 to 456, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1668] Aspect 458. The IL-2Rα ligand of any one of aspects 456 to 457, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1669] Aspect 459. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (12a) (SEQ ID NO: 141), the amino acid sequence of Formula (12b) (SEQ ID NO: 142), or the amino acid sequence of Formula (12c) (SEQ ID NO: 143):

$$-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (12a)$$

$$-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}- \quad (12b)$$

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-X^{14}-X^{15}-X^{16}- \quad (12c)$$

wherein,

X^1 is selected from an amino acid;

X^2 is selected from an amino acid;

X^3 is C;

X^4 is selected from an amino acid;

X^5 is selected from an amino acid comprising a large hydrophobic side chain;

X^6 is selected from an amino acid;

X^7 is selected from an amino acid;

X^8 is selected from an amino acid;

X^9 is selected from an amino acid comprising an acidic side chain, a small hydrophobic side chain, or a polar neutral side chain;

X^{10} is selected from an amino acid;

X^{11} is selected from an amino acid comprising a large hydrophobic side chain;

X^{12} is selected from an amino acid comprising a large hydrophobic side chain;

X^{13} is C;

X^{14} is selected from an amino acid comprising a large hydrophobic side chain; and

X^{15} is selected from an amino acid comprising a large hydrophobic side chain.

[1670] Aspect 471. The IL-2Rα ligand of aspect 459, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 is C;

X^4 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^5 is selected from F, I, L, M, V, W, and Y;

X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 is selected from A, D, E, G, H, N, P, Q, S, T, and Y;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is selected from F, I, L, M, V, W, and Y;

X^{12} is selected from F, I, L, M, V, W, and Y;

X^{13} is C;

X^{14} is selected from F, I, L, M, V, W, and Y; and

X^{15} is selected from F, I, L, M, V, W, and Y.

[1671] Aspect 461. The IL-2Rα ligand of any one of aspects 459 to 460, wherein X^1 is selected from S, N, Q, R, and G.

[1672] Aspect 462. The IL-2Rα ligand of any one of aspects 459 to 461, wherein X^2 is selected from A, H, R, and G.

[1673] Aspect 463. The IL-2Rα ligand of any one of aspects 459 to 462, wherein X^3 is C.

[1674] Aspect 464. The IL-2Rα ligand of any one of aspects 459 to 463, wherein X^4 is selected from Q, T, N, M, and S.

[1675] Aspect 465. The IL-2Rα ligand of any one of aspects 459 to 464, wherein X^5 is selected from L and R.

[1676] Aspect 466. The IL-2Rα ligand of any one of aspects 459 to 465, wherein X^6 is selected from K, S, R, and V.

[1677] Aspect 467. The IL-2Rα ligand of any one of aspects 459 to 466, wherein X^7 is selected from W, K, and L.

[1678] Aspect 468. The IL-2Rα ligand of any one of aspects 459 to 467, wherein X^8 is selected from D, T, L, Q, and A.

[1679] Aspect 469. The IL-2Rα ligand of any one of aspects 459 to 468, wherein X^9 is selected from E, Y, D, and P.

[1680] Aspect 470. The IL-2Rα ligand of any one of aspects 459 to 469, wherein X^{10} is selected from G, P, A, E, and S.

[1681] Aspect 471. The IL-2Rα ligand of any one of aspects 459 to 470, wherein X^{11} is selected from W and L.

[1682] Aspect 472. The IL-2Rα ligand of any one of aspects 459 to 471, wherein X^{12} is selected from T, V, I, and A.

[1683] Aspect 473. The IL-2Rα ligand of any one of aspects 459 to 472, wherein X^{13} is C.

[1684] Aspect 474. The IL-2Rα ligand of any one of aspects 459 to 473, wherein X^{14} is selected from L, V, Q, and I.

[1685] Aspect 475. The IL-2Rα ligand of any one of aspects 459 to 474, wherein X^{15} is selected from F and A.

[1686] Aspect 476. The IL-2Rα ligand of any one of aspects 459 to 475, wherein X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1687] Aspect 477. The IL-2Rα ligand of any one of aspects 459 to 476, wherein X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1688] Aspect 478. The IL-2Rα ligand of any one of aspects 459 to 477, wherein X^3 is C.

[1689] Aspect 479. The IL-2Rα ligand of any one of aspects 459 to 478, wherein X^4 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1690] Aspect 480. The IL-2Rα ligand of any one of aspects 459 to 479, wherein X^5 is L.

[1691] Aspect 481. The IL-2Rα ligand of any one of aspects 459 to 480, wherein X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1692] Aspect 482. The IL-2Rα ligand of any one of aspects 459 to 481, wherein X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1693] Aspect 483. The IL-2Rα ligand of any one of aspects 459 to 482, wherein X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1694] Aspect 484. The IL-2Rα ligand of any one of aspects 459 to 483, wherein X^9 is selected from D and E.

[1695] Aspect 485. The IL-2Rα ligand of any one of aspects 459 to 484, wherein X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1696] Aspect 486. The IL-2Rα ligand of any one of aspects 459 to 485, wherein X^{11} is selected from F, I, L, M, V, W, and Y.

[1697] Aspect 487. The IL-2Rα ligand of any one of aspects 459 to 485, wherein X^{11} is W.

[1698] Aspect 488. The IL-2Rα ligand of any one of aspects 459 to 487, wherein X^{12} is selected from F, I, L, M, V, W, and Y.

[1699] Aspect 489. The IL-2Rα ligand of any one of aspects 459 to 488, wherein X^{13} is C.

[1700] Aspect 490. The IL-2Rα ligand of any one of aspects 459 to 489, wherein X^{14} is selected from F, I, L, M, V, W, and Y.

[1701] Aspect 491. The IL-2Rα ligand of any one of aspects 459 to 490, wherein X^{15} is F.

[1702] Aspect 492. The IL-2Rα ligand of aspect 459, wherein X^3 is C, X^5 is L, X^9 is D or E, X^{11} is W, X^{13} is C, and X^{15} is F.

[1703] Aspect 493. The IL-2Rα ligand of aspect 459, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 is C;

X^4 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^5 is L;

X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 is selected from D and E;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y:

X^{11} is selected from F, I, L, M, V, W, and Y;

X^{12} is selected from F, I, L, M, V, W, and Y;

X^{13} is C;

X^{14} is selected from F, I, L, M, V, W, and Y; and

X^{15} is F.

[1704] Aspect 494. The IL-2Rα ligand of aspect 459, wherein X^3 is C, X^5 is L, X^{11} is W, X^{13} is C, and X^{15} is F.

[1705] Aspect 495. The IL-2Rα ligand of aspect 459, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 144 to SEQ ID NO: 148:

SEQ ID NO: 144	S	A	C	Q	L	K	W	D	E	G	W	T	C	L	F
SEQ ID NO: 145	N	H	C	T	L	S	K	T	Y	P	W	V	C	V	F
SEQ ID NO: 146	Q	R	C	N	R	S	L	L	D	A	L	I	C	Q	A
SEQ ID NO: 147	R	G	C	M	L	R	L	Q	P	E	L	A	C	V	F
SEQ ID NO: 148	G	G	C	S	L	V	W	A	D	S	W	V	C	I	F

[1706] Aspect 496. The IL-2Rα ligand of any one of aspects 459 to 495, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1707] Aspect 497. The IL-2Rα ligand of any one of aspects 495 to 496, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1708] Aspect 498. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (13a) (SEQ ID NO: 149), the amino acid sequence of Formula (13b) (SEQ ID NO: 150), or the amino acid sequence of Formula (13c) (SEQ ID NO: 151):

$$-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (13a)$$

$$-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}- \quad (13b)$$

$$-X^1-X^2-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-X^{14}-X^{15}- \quad (13c)$$

wherein,

X^1 is selected from an amino acid comprising a small hydrophobic side chain or a basic side chain;

X^2 is selected from an amino acid comprising a small hydrophobic side chain or a basic side chain;

X^3 is C;

X^4 is selected from an amino acid comprising a small hydrophobic side chain;

X^5 is selected from an amino acid comprising a large hydrophobic side chain;

X^6 is selected from an amino acid comprising a large hydrophobic side chain;

X^7 is selected from an amino acid comprising a large hydrophobic side chain;

X^8 is selected from an amino acid;

X^9 is selected from an amino acid comprising an acidic side chain;

X^{10} is selected from an amino acid comprising a small hydrophobic side chain;

X^{11} is selected from an amino acid comprising a large hydrophobic side chain;

X^{12} is selected from an amino acid comprising a large hydrophobic side chain or an acidic side chain;

X^{13} is C;

X^{14} is selected from an amino acid comprising a large hydrophobic side chain; and

X^{15} is selected from an amino acid comprising a large hydrophobic side chain.

[1709] Aspect 499. The IL-2Rα ligand of aspect 498, wherein,

X^1 is selected from A, G, H, K, P, R, S, and T;

X^2 is selected from A, G, H, K, P, R, S, and T;

X^3 is C;

X^4 is selected from A, G, P, S, and T;

X^5 is selected from F, I, L, M, V, W, and Y;

X^6 is selected from F, I, L, M, V, W, and Y;

X^7 is selected from F, I, L, M, V, W, and Y;

X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 is selected from D and E;

X^{10} is selected from A, G, P, S, and T;

X^{11} is selected from F, I, L, M, V, W, and Y;

X^{12} is selected from D, E, F, I, L, M, V, W, and Y;

X^{13} is C;

X^{14} is selected from F, I, L, M, V, W, and Y; and

X^{15} is selected from F, I, L, M, V, W, and Y.

[1710] Aspect 500. The IL-2Rα ligand of any one of aspects 498 to 499, wherein X^1 is selected from S, R, Q, V, A, and G.

[1711] Aspect 501. The IL-2Rα ligand of any one of aspects 498 to 500, wherein X^2 is selected from R, G, A, and S.

[1712] Aspect 502. The IL-2Rα ligand of any one of aspects 498 to 501, wherein X^3 is C.

[1713] Aspect 503. The IL-2Rα ligand of any one of aspects 498 to 502, wherein X^4 is selected from S, T, Q, and H.

[1714] Aspect 504. The IL-2Rα ligand of any one of aspects 498 to 503, wherein X^5 is L.

[1715] Aspect 505. The IL-2Rα ligand of any one of aspects 498 to 504, wherein X^6 is selected from V, Q, A, and R.

[1716] Aspect 506. The IL-2Rα ligand of any one of aspects 498 to 505, wherein X^7 is selected from W and F.

[1717] Aspect 507. The IL-2Rα ligand of any one of aspects 498 to 506, wherein X^8 is selected from T, D, S, L, A, E, and Q.

[1718] Aspect 508. The IL-2Rα ligand of any one of aspects 498 to 507, wherein X^9 is selected from D, G, and E.

[1719] Aspect 509. The IL-2Rα ligand of any one of aspects 498 to 507, wherein X^{10} is selected from T, S, R, G, A, S, and N.

[1720] Aspect 510. The IL-2Rα ligand of any one of aspects 498 to 508, wherein X^{11} is W.

[1721] Aspect 511. The IL-2Rα ligand of any one of aspects 498 to 510, wherein X^{12} is selected from V and E.

[1722] Aspect 512. The IL-2Rα ligand of any one of aspects 498 to 511, wherein X^{13} is C.

[1723] Aspect 513. The IL-2Rα ligand of any one of aspects 498 to 512, wherein X^{14} is selected from V and I.

[1724] Aspect 514. The IL-2Rα ligand of any one of aspects 498 to 513, wherein X^{15} is F.

[1725] Aspect 515. The IL-2Rα ligand of any one of aspects 498 to 514, wherein X^1 is selected from A, G, P, S, and T.

[1726] Aspect 516. The IL-2Rα ligand of any one of aspects 498 to 514, wherein X^1 is selected from H, K, and R.

[1727] Aspect 517. The IL-2Rα ligand of any one of aspects 498 to 516, wherein X^2 is selected from A, G, P, S, and T.

[1728] Aspect 518. The IL-2Rα ligand of any one of aspects 498 to 516, wherein X^2 is selected from H, K, and R.

[1729] Aspect 519. The IL-2Rα ligand of any one of aspects 498 to 518, wherein X^2 is selected from R and G.

[1730] Aspect 520. The IL-2Rα ligand of any one of aspects 498 to 519, wherein X^3 is C.

[1731] Aspect 521. The IL-2Rα ligand of any one of aspects 498 to 520, wherein X^4 is selected from A, G, P, S, and T.

[1732] Aspect 522. The IL-2Rα ligand of any one of aspects 498 to 520, wherein X^4 is selected from S and T.

[1733] Aspect 523. The IL-2Rα ligand of any one of aspects 498 to 522, wherein X^5 is selected from F, I, L, M, V, W, and Y.

[1734] Aspect 524. The IL-2Rα ligand of any one of aspects 498 to 522, wherein X^5 is L.

[1735] Aspect 525. The IL-2Rα ligand of any one of aspects 498 to 524, wherein X^6 is selected from F, I, L, M, V, W, and Y.

[1736] Aspect 526. The IL-2Rα ligand of any one of aspects 498 to 524, wherein X^6 is V.

[1737] Aspect 527. The IL-2Rα ligand of any one of aspects 498 to 526, wherein X^7 is selected from F, I, L, M, V, W, and Y.

[1738] Aspect 528. The IL-2Rα ligand of any one of aspects 498 to 526, wherein X^7 is selected from F, W, and Y.

[1739] Aspect 529. The IL-2Rα ligand of any one of aspects 498 to 526, wherein X^7 is W.

[1740] Aspect 530. The IL-2Rα ligand of any one of aspects 498 to 529, wherein X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1741] Aspect 531. The IL-2Rα ligand of any one of aspects 498 to 530, wherein X^8 is selected from A, G, P, S, and T.

[1742] Aspect 532. The IL-2Rα ligand of any one of aspects 498 to 530, wherein X^8 is A.

[1743] Aspect 533. The IL-2Rα ligand of any one of aspects 498 to 532, wherein X^9 is selected from D and E.

[1744] Aspect 534. The IL-2Rα ligand of any one of aspects 498 to 532, wherein X^9 is D.

[1745] Aspect 535. The IL-2Rα ligand of any one of aspects 498 to 534, wherein X^{10} is selected from A, G, P, S, and T.

[1746] Aspect 536. The IL-2Rα ligand of any one of aspects 498 to 534, wherein X^{10} is S.

[1747] Aspect 537. The IL-2Rα ligand of any one of aspects 498 to 536, wherein X^{11} is selected from F, I, L, M, V, W, and Y.

[1748] Aspect 538. The IL-2Rα ligand of any one of aspects 498 to 536, wherein X^{11} is selected from F, W, and Y.

[1749] Aspect 539. The IL-2Rα ligand of any one of aspects 498 to 536, wherein X^{11} is W.

[1750] Aspect 540. The IL-2Rα ligand of any one of aspects 498 to 539, wherein X^{12} is selected from F, I, L, M, V, W, and Y.

[1751] Aspect 541. The IL-2Rα ligand of any one of aspects 498 to 540, wherein X^{12} is selected from D and E.

[1752] Aspect 542. The IL-2Rα ligand of any one of aspects 498 to 540, wherein X^{12} is selected from V and E.

[1753] Aspect 543. The IL-2Rα ligand of any one of aspects 498 to 540, wherein X^{12} is V.

[1754] Aspect 544. The IL-2Rα ligand of any one of aspects 498 to 543, wherein X^{13} is C.

[1755] Aspect 545. The IL-2Rα ligand of any one of aspects 498 to 544, wherein X^{14} is selected from F, I, L, M, V, W, and Y.

[1756] Aspect 546. The IL-2Rα ligand of any one of aspects 498 to 544, wherein X^{14} is I.

[1757] Aspect 547. The IL-2Rα ligand of any one of aspects 498 to 546, wherein X^{15} is F.

[1758] Aspect 548. The IL-2Rα ligand of aspect 498, wherein X^2 is R, X^3 is C, X^5 is S, X^6 is L, X^7 is V, X^8 is W, X^{10} is D, X^{11} is S, X^{12} is W, X^{13} is V, X^{14} is C, X^{15} is I, and X^{16} is F.

[1759] Aspect 549. The IL-2Rα ligand of aspect 498, wherein,

X^1 is selected from A, D, E, G, P, S, and T;

X^2 is selected from G and R;

X^3 is C;

X^4 is selected from S and T;

X^5 is L;

X^6 is V;

X^7 is selected from F and W;

X^8 is selected from A, G, P, S, and T;

X^9 is selected from D and E;

X^{10} is S;

X^{11} is W;

X^{12} is V;

X^{13} is C;

X^{14} is I; and

X^{15} is F.

[1760] Aspect 550. The IL-2Rα ligand of aspect 498, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 152 to SEQ ID NO: 166:

SEQ ID NO: 152	S	R	C	S	L	V	W	T	D	T	W	V	C	V	F
SEQ ID NO: 153	S	R	C	T	L	V	F	D	D	S	W	V	C	V	F
SEQ ID NO: 154	R	G	C	S	L	V	W	S	G	S	W	E	C	I	F
SEQ ID NO: 155	Q	A	C	Q	L	V	W	L	D	S	W	V	C	I	F
SEQ ID NO: 156	V	G	C	S	L	V	W	T	D	R	W	E	C	I	F
SEQ ID NO: 157	S	G	C	S	L	Q	W	A	D	G	W	V	C	I	F
SEQ ID NO: 158	A	R	C	S	L	V	W	D	E	A	W	V	C	I	F
SEQ ID NO: 159	R	G	C	S	L	V	W	A	G	S	W	E	C	I	F
SEQ ID NO: 160	S	R	C	S	L	V	W	A	E	N	W	V	C	I	F
SEQ ID NO: 161	R	R	C	T	L	V	F	L	D	S	W	E	C	I	F
SEQ ID NO: 162	R	G	C	T	L	A	W	E	D	S	W	V	C	I	F
SEQ ID NO: 163	R	G	C	S	L	R	F	A	E	A	W	E	C	I	F
SEQ ID NO: 164	A	S	C	S	L	V	W	Q	D	S	W	V	C	I	F
SEQ ID NO: 165	S	R	C	S	L	V	W	A	D	S	W	V	C	I	F
SEQ ID NO: 166	G	R	C	H	L	V	W	S	D	R	W	E	C	I	F

[1761] Aspect 551. The IL-2Rα ligand of any one of aspects 498 to 550, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1762] Aspect 552. The IL-2Rα ligand of any one of aspects 550 to 551, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1763] Aspect 553. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (14a) (SEQ ID NO: 167), or the amino acid sequence of Formula (14b) (SEQ ID NO: 168):

$$-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (14a)$$

$$-X^1-C-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}- \quad (14b)$$

wherein,

X^1 is selected from an amino acid comprising a small hydrophobic side chain;

X^2 is C;

X^3 is selected from an amino acid comprising a small hydrophobic side chain;

X^4 is selected from an amino acid comprising a large hydrophobic side chain;

X^5 is selected from an amino acid;

X^6 is selected from an amino acid comprising a large hydrophobic side chain;

X^7 is selected from an amino acid comprising an acidic side chain or a polar neutral side chain;

X^8 is selected from an amino acid;

X^9 is selected from an amino acid;

X^{10} is selected from an amino acid comprising a large hydrophobic side chain;

X^{11} is selected from an amino acid comprising a large hydrophobic side chain;

X^{12} is selected from an amino acid comprising a large hydrophobic side chain or an acidic side chain;

X^{13} is C; and

X^{14} is selected from an amino acid comprising a large hydrophobic side chain.

[1764] Aspect 554. The IL-2Rα ligand of aspect 553, wherein,

X^1 is selected from A, G, P, S, and T;

X^2 is C;

X^3 is selected from A, G, P, S, and T;

X^4 is selected from F, I, L, M, V, W, and Y;

X^5 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^6 is selected from F, I, L, M, V, W, and Y;

X^7 is selected from D, E, N, Q, S, T, and Y;

X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} is selected from F, I, L, M, V, W, and Y;

X^{11} is selected from F, I, L, M, V, W, and Y;

X^{11} is selected from D, E, F, I, L, M, V, W, and Y;

X^{13} is C; and

X^{14} is selected from F, I, L, M, V, W, and Y.

[1765] Aspect 555. The IL-2Rα ligand of any one of aspects 553 to 554, wherein X^1 is selected from G and S.

[1766] Aspect 556. The IL-2Rα ligand of any one of aspects 553 to 555, wherein X^2 is C.

[1767] Aspect 557. The IL-2Rα ligand of any one of aspects 553 to 556, wherein X^3 is selected from T, S, M, and V.

[1768] Aspect 558. The IL-2Rα ligand of any one of aspects 553 to 557, wherein X^4 is selected from L and V.

[1769] Aspect 559. The IL-2Rα ligand of any one of aspects 553 to 558, wherein X^5 is selected from K, R, M, S, T, and Q.

[1770] Aspect 560. The IL-2Rα ligand of any one of aspects 553 to 559, wherein X^6 is selected from W, R, and F.

[1771] Aspect 561. The IL-2Rα ligand of any one of aspects 553 to 560, wherein X^7 is selected from E, D, Q, N, G, and S.

[1772] Aspect 562. The IL-2Rα ligand of any one of aspects 553 to 561, wherein X^8 is selected from S, G, D, Q, K, and G.

[1773] Aspect 563. The IL-2Rα ligand of any one of aspects 553 to 562, wherein X^9 is selected from P, D, G, F, and V.

[1774] Aspect 564. The IL-2Rα ligand of any one of aspects 553 to 563, wherein X^{10} is selected from N and W.

[1775] Aspect 565. The IL-2Rα ligand of any one of aspects 553 to 564, wherein X^{11} is W.

[1776] Aspect 566. The IL-2Rα ligand of any one of aspects 553 to 565, wherein X^{12} is selected from T, V, H, and E.

[1777] Aspect 567. The IL-2Rα ligand of any one of aspects 553 to 566, wherein X^{13} is C.

[1778] Aspect 568. The IL-2Rα ligand of any one of aspects 553 to 567, wherein X^{14} is selected from Y, E, I, and V.

[1779] Aspect 569. The IL-2Rα ligand of any one of aspects 553 to 568, wherein X^1 is G.

[1780] Aspect 570. The IL-2Rα ligand of any one of aspects 553 to 569, wherein X^2 is C.

[1781] Aspect 571. The IL-2Rα ligand of any one of aspects 553 to 570, wherein X^3 is selected from S and T.

[1782] Aspect 572. The IL-2Rα ligand of any one of aspects 553 to 570, wherein X^3 is T.

[1783] Aspect 573. The IL-2Rα ligand of any one of aspects 553 to 572, wherein X^4 is L.

[1784] Aspect 574. The IL-2Rα ligand of any one of aspects 553 to 573, wherein X^5 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1785] Aspect 575. The IL-2Rα ligand of any one of aspects 553 to 574, wherein X^6 is W.

[1786] Aspect 576. The IL-2Rα ligand of any one of aspects 553 to 575, wherein X^7 is selected from D, E, Q, and N.

[1787] Aspect 577. The IL-2Rα ligand of any one of aspects 553 to 576, wherein X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1788] Aspect 578. The IL-2Rα ligand of any one of aspects 553 to 577, wherein X^9 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1789] Aspect 579. The IL-2Rα ligand of any one of aspects 553 to 578, wherein X^{10} is W.

[1790] Aspect 580. The IL-2Rα ligand of any one of aspects 553 to 579, wherein X^{11} is W.

[1791] Aspect 581. The IL-2Rα ligand of any one of aspects 553 to 580, wherein X^{12} is selected from F, I, L, M, V, W, and Y.

[1792] Aspect 582. The IL-2Rα ligand of any one of aspects 553 to 581, wherein X^{12} is selected from D and E.

[1793] Aspect 583. The IL-2Rα ligand of any one of aspects 553 to 581, wherein X^{12} is selected from E and V.

[1794] Aspect 584. The IL-2Rα ligand of any one of aspects 553 to 583, wherein X^{13} is C.

[1795] Aspect 585. The IL-2Rα ligand of any one of aspects 553 to 584, wherein X^{14} is selected from F, I, L, M, V, W, and Y.

[1796] Aspect 586. The IL-2Rα ligand of any one of aspects 553 to 584, wherein X^{14} is selected from I and V.

[1797] Aspect 587. The IL-2Rα ligand of aspect 553, wherein X^1 is G, X^2 is C, X^3 is T, X^4 is L, X^6 is W, X^{10} is W, X^{11} is W, and X^{13} is C.

[1798] Aspect 588. The IL-2Rα ligand of aspect 553, wherein,

X^1 is G;

X^2 is C;

X^3 is selected from T and S;

X^4 is L;

X^5 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^6 is W;

X^7 is selected from D, E, N, Q, S, T, and Y;

X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} is W;

X^{11} is W;

X^{12} is selected from V and E;

X^{13} is C; and

X^{14} is selected from F, I, L, M, V, W, and Y.

[1799] Aspect 589. The IL-2Rα ligand of aspect 553, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 169 to SEQ ID NO: 174:

SEQ ID NO: 169	G	C	T	L	K	W	E	S	P	N	W	T	C	Y
SEQ ID NO: 170	S	C	T	V	R	W	D	G	D	W	W	V	C	E
SEQ ID NO: 171	G	C	S	L	M	W	Q	D	G	W	W	V	C	I
SEQ ID NO: 172	G	C	T	L	S	W	N	Q	G	W	W	H	C	V
SEQ ID NO: 173	G	C	M	L	T	R	G	K	F	W	W	E	C	I
SEQ ID NO: 174	G	C	V	L	Q	F	S	G	V	W	W	E	C	V

[1800] Aspect 590. The IL-2Rα ligand of any one of aspects 553 to 589, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1801] Aspect 591. The IL-2Rα ligand of any one of aspects 589 to 590, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1802] Aspect 592. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (15a) (SEQ ID NO: 175), the amino acid sequence of Formula (15b) (SEQ ID NO: 176), or the amino acid sequence of Formula (15c) (SEQ ID NO: 177):

$$-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}- \quad (15a)$$

$$-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-C-X^{15}- \quad (15b)$$

$$-X^1-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-C-X^{15}-X^{16}- \quad (15c)$$

wherein,

X^1 is selected from an amino acid;

X^2 is selected from an amino acid;

X^3 is C;

X^4 is selected from an amino acid comprising a polar/neutral side chain or a basic side chain;

X^5 is selected from an amino acid comprising a large hydrophobic side chain;

X^6 is selected from an amino acid;

X^7 is selected from an amino acid comprising a polar neutral side chain or a basic side chain;

X^8 is P;

X^9 is G;

X^{10} is selected from an amino acid;

X^{11} is selected from an amino acid;

X^{12} is selected from an amino acid comprising a large hydrophobic side chain;

X^{13} is selected from an amino acid comprising an acidic side chain or a polar/neutral side chain;

X^{14} is C;

X^{15} is selected from an amino acid comprising a large hydrophobic side chain; and

X^{16} is selected from an amino acid comprising a large hydrophobic side chain.

[1803] Aspect 593. The IL-2Rα ligand of aspect 592, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 is C;

X^4 is selected from H, K, N, Q, R, S, T, and Y;

X^5 is selected from F, I, L, M, V, W, and Y;

X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 is selected from H, K, N, Q, R, S, T, and Y;

X^8 is P;

X^9 is G;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} is selected from F, I, L, M, V, W, and Y;

X^{13} is selected from D, E, N, Q, S, T, and Y;

X^{14} is C;

X^{15} is selected from F, I, L, M, V, W, and Y; and

X^{16} is selected from F, I, L, M, V, W, and Y.

[1804] Aspect 594. The IL-2Rα ligand of any one of aspects 592 to 593, wherein X^1 is selected from Q, A, G, K, L, N, P, Q, S, and T.

[1805] Aspect 595. The IL-2Rα ligand of any one of aspects 592 to 594, wherein X^2 is selected from R, G, K, T, P, A, S, and H.

[1806] Aspect 596. The IL-2Rα ligand of any one of aspects 592 to 595, wherein X^3 is C.

[1807] Aspect 597. The IL-2Rα ligand of any one of aspects 592 to 596, wherein X^4 is selected from Q, M, S, R, T, I, K, R, H, and L.

[1808] Aspect 598. The IL-2Rα ligand of any one of aspects 592 to 597, wherein X^5 is selected from L, P, M, and V.

[1809] Aspect 599. The IL-2Rα ligand of any one of aspects 592 to 598, wherein X^6 is selected from S, L, R, Q, F, W, N, I, and G.

[1810] Aspect 600. The IL-2Rα ligand of any one of aspects 592 to 599, wherein X^7 is selected from K, H, R, W, L, N, F, and V.

[1811] Aspect 601. The IL-2Rα ligand of any one of aspects 592 to 600, wherein X^8 is selected from S, P, T, and L.

[1812] Aspect 602. The IL-2Rα ligand of any one of aspects 592 to 601, wherein X^9 is G.

[1813] Aspect 603. The IL-2Rα ligand of any one of aspects 592 to 602, wherein X^{10} is selected from G, L, S, D, T, E, M, N, F, H, R, K, and P.

[1814] Aspect 604. The IL-2Rα ligand of any one of aspects 592 to 603, wherein X^{11} is selected from E, Y, R, G, H, S, I, G, L, W, F, and V.

[1815] Aspect 605. The IL-2Rα ligand of any one of aspects 592 to 604, wherein X^{12} is selected from L, W, Y, H, and V.

[1816] Aspect 606. The IL-2Rα ligand of any one of aspects 592 to 605, wherein X^{13} is selected from G, E, V, T, Q, and A.

[1817] Aspect 607. The IL-2Rα ligand of any one of aspects 592 to 606, wherein X^{14} is C.

[1818] Aspect 608. The IL-2Rα ligand of any one of aspects 592 to 607, wherein X^{15} is selected from M, I, V, L, W, R, and F.

[1819] Aspect 609. The IL-2Rα ligand of any one of aspects 592 to 609, wherein X^{16} is selected from F, S, and G.

[1820] Aspect 610. The IL-2Rα ligand of any one of aspects 592 to 609, wherein X^1 is selected from S and T.

[1821] Aspect 611. The IL-2Rα ligand of any one of aspects 592 to 610, wherein X^2 is selected from S, T, R, and K.

[1822] Aspect 612. The IL-2Rα ligand of any one of aspects 592 to 611, wherein X^3 is C.

[1823] Aspect 613. The IL-2Rα ligand of any one of aspects 592 to 612, wherein X^4 is selected from N, Q, S, T, and Y.

[1824] Aspect 614. The IL-2Rα ligand of any one of aspects 592 to 612, wherein X^4 is T.

[1825] Aspect 615. The IL-2Rα ligand of any one of aspects 592 to 614, wherein X^5 is selected from L, M, and V.

[1826] Aspect 616. The IL-2Rα ligand of any one of aspects 592 to 614, wherein X^5 is L.

[1827] Aspect 617. The IL-2Rα ligand of any one of aspects 592 to 616, wherein X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1828] Aspect 618. The IL-2Rα ligand of any one of aspects 592 to 617, wherein X^7 is selected from N, K, H, and R.

[1829] Aspect 619. The IL-2Rα ligand of any one of aspects 592 to 617, wherein X^7 is N.

[1830] Aspect 620. The IL-2Rα ligand of any one of aspects 592 to 619, wherein X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1831] Aspect 621. The IL-2Rα ligand of any one of aspects 592 to 620, wherein X^8 is selected from A, G, P, S, and T.

[1832] Aspect 622. The IL-2Rα ligand of any one of aspects 592 to 620, wherein X^8 is P.

[1833] Aspect 623. The IL-2Rα ligand of any one of aspects 592 to 622, wherein X^9 is G.

[1834] Aspect 624. The IL-2Rα ligand of any one of aspects 592 to 623, wherein X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1835] Aspect 625. The IL-2Rα ligand of any one of aspects 592 to 624, wherein X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1836] Aspect 626. The IL-2Rα ligand of any one of aspects 592 to 625, wherein X^{11} is selected from A, G, P, S, and T.

[1837] Aspect 627. The IL-2Rα ligand of any one of aspects 592 to 625, wherein X^{11} is G.

[1838] Aspect 628. The IL-2Rα ligand of any one of aspects 592 to 627, wherein X^{12} is W.

[1839] Aspect 629. The IL-2Rα ligand of any one of aspects 592 to 628, wherein X^{13} is selected from N, Q, S, T, and Y.

[1840] Aspect 630. The IL-2Rα ligand of any one of aspects 592 to 628, wherein X^{13} is selected from D and E.

[1841] Aspect 631. The IL-2Rα ligand of any one of aspects 592 to 628, wherein X^{13} is selected from E and Q.

[1842] Aspect 632. The IL-2Rα ligand of any one of aspects 592 to 628, wherein X^{13} is E.

[1843] Aspect 633. The IL-2Rα ligand of any one of aspects 592 to 632, wherein X^{14} is C.

[1844] Aspect 634. The IL-2Rα ligand of any one of aspects 592 to 633, wherein X^{15} is selected from F, I, L, M, V, W, and Y.

[1845] Aspect 635. The IL-2Rα ligand of any one of aspects 592 to 633, wherein X^{15} is selected from M, I, V, L, and F.

[1846] Aspect 636. The IL-2Rα ligand of any one of aspects 592 to 633, wherein X^{15} is selected from I and V.

[1847] Aspect 637. The IL-2Rα ligand of any one of aspects 592 to 636, wherein X^{16} is F.

[1848] Aspect 638. The IL-2Rα ligand of aspect 592, wherein X^3 is C, X^5 is L, X^8 is P, X^9 is G, X^{12} is W, X^{13} is E, X^{14} is C, and X^{16} is F.

[1849] Aspect 639. The IL-2Rα ligand of aspect 592, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 is C;

X^4 is selected from N, Q, S, T, and Y;

X^5 is L;

X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 is selected from N, Q, S, T, and Y;

X^8 is P;

X^9 is G;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is selected from A, G, P, S, and T;

X^{12} is W;

X^{13} is selected from E and Q;

X^{14} is C;

X^{15} is selected from F, I, L, M, V, W, and Y; and

X^{16} is F.

[1850] Aspect 640. The IL-2Rα ligand of aspect 592, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 178 to SEQ ID NO: 195:

SEQ ID NO: 178	Q	R	C	Q	L	S	W	S	G	G	E	L	G	C	M	F
SEQ ID NO: 179	A	G	C	M	L	L	K	P	G	L	Y	W	E	C	I	F
SEQ ID NO: 180	A	R	C	S	L	H	H	T	G	S	R	Y	E	C	I	F
SEQ ID NO: 181	A	T	C	M	L	R	L	L	G	D	G	W	G	C	V	F
SEQ ID NO: 182	G	P	C	R	L	S	N	P	G	T	G	W	E	C	I	F
SEQ ID NO: 183	K	G	C	T	L	Q	N	P	G	S	G	W	V	C	L	F
SEQ ID NO: 184	L	A	C	I	L	S	K	P	G	E	H	W	E	C	L	F
SEQ ID NO: 185	N	G	C	T	L	S	F	S	G	M	S	W	T	C	V	Y
SEQ ID NO: 186	N	S	C	I	L	S	N	P	G	L	G	W	Q	C	V	F
SEQ ID NO: 187	N	T	C	K	L	F	R	S	G	N	I	W	Q	C	I	F
SEQ ID NO: 188	P	S	C	R	L	W	N	P	G	F	G	W	E	C	I	F
SEQ ID NO: 189	Q	S	C	T	L	Q	R	L	G	H	L	Y	Q	C	W	F
SEQ ID NO: 190	S	A	C	T	P	N	W	T	G	R	W	W	E	C	V	F
SEQ ID NO: 191	S	K	C	H	L	I	V	S	G	K	F	H	E	C	V	F
SEQ ID NO: 192	S	S	C	T	L	F	N	P	G	T	G	W	T	C	V	F
SEQ ID NO: 193	S	T	C	R	M	G	N	P	G	G	V	W	G	C	Y	F
SEQ ID NO: 194	T	H	C	L	V	Q	W	P	G	P	V	V	A	C	R	S
SEQ ID NO: 195	T	R	C	R	L	L	K	L	G	S	L	W	E	C	F	G

[1851] Aspect 641. The IL-2Rα ligand of any one of aspects 592 to 640, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1852] Aspect 642. The IL-2Rα ligand of any one of aspects 640 to 641, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1853] Aspect 643. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (16a) (SEQ ID NO: 196), or the amino acid sequence of Formula (16b) (SEQ ID NO: 197):

$$-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}- \quad (16a)$$

$$-X^1-C-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-C-X^{15}- \quad (16b)$$

wherein,

X^1 is selected from an amino acid;

X^2 is C;

X^3 is selected from an amino acid comprising a basic side chain;

X^4 is selected from an amino acid comprising a large hydrophobic side chain;

X^5 is selected from an amino acid comprising a basic side chain or a polar/neutral side chain;

X^6 is selected from an amino acid comprising a basic side chain or a polar/neutral side chain;

X^7 is selected from an amino acid;

X^8 is selected from an amino acid;

X^9 is selected from an amino acid;

X^{10} is selected from an amino acid;

X^{11} is selected from an amino acid;

X^{12} is selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^{13} is selected from an amino acid comprising an acidic side chain;

X^{14} is C; and

X^{15} is selected from an amino acid comprising a large hydrophobic side chain.

[1854] Aspect 644. The IL-2Rα ligand of aspect 643, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from C;

X^3 is selected from H, K, and R;

X^4 is selected from F, I, L, M, V, W, and Y;

X^5 is selected from H, K, N, Q, R, S, T, and Y;

X^6 is selected from H, K, N, Q, R, S, T, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} is selected from F, H, I, L, M, V, W, and Y;

X^{13} is selected from D and E;

X^{14} is C; and

X^{15} is selected from F, I, L, M, V, W, and Y.

[1855] Aspect 645. The IL-2Rα ligand of any one of aspects 643 to 644, wherein X^1 is selected from A, K, N, R, and T.

[1856] Aspect 646. The IL-2Rα ligand of any one of aspects 643 to 645, wherein X^2 is C.

[1857] Aspect 647. The IL-2Rα ligand of any one of aspects 643 to 646, wherein X^3 is selected from W, R, and T.

[1858] Aspect 648. The IL-2Rα ligand of any one of aspects 643 to 647, wherein X^4 is selected from R, L, and V.

[1859] Aspect 649. The IL-2Rα ligand of any one of aspects 643 to 648, wherein X^5 is selected from S, R, Q, K, and H.

[1860] Aspect 650. The IL-2Rα ligand of any one of aspects 643 to 649, wherein X^6 is selected from W, Q, H, K, F, and R.

[1861] Aspect 651. The IL-2Rα ligand of any one of aspects 643 to 650, wherein X^7 is selected from R, M, L, A, D, S, and I.

[1862] Aspect 652. The IL-2Rα ligand of any one of aspects 643 to 651, wherein X^8 is selected from Y, S, P, G, and A.

[1863] Aspect 653. The IL-2Rα ligand of any one of aspects 643 to 652, wherein X^9 is selected from P, R, Y, G, Q, P, and L.

[1864] Aspect 654. The IL-2Rα ligand of any one of aspects 643 to 653, wherein X^{10} is selected from T, G, P, N, T, N, and A.

[1865] Aspect 655. The IL-2Rα ligand of any one of aspects 643 to 654, wherein X^{11} is selected from R, G, F, T, G, S, and E.

[1866] Aspect 656. The IL-2Rα ligand of any one of aspects 643 to 655, wherein X^{12} is selected from T and W.

[1867] Aspect 657. The IL-2Rα ligand of any one of aspects 643 to 656, wherein X^{13} is selected from F, E, and S.

[1868] Aspect 658. The IL-2Rα ligand of any one of aspects 643 to 657, wherein X^{14} is C.

[1869] Aspect 659. The IL-2Rα ligand of any one of aspects 643 to 658, wherein X^{15} is selected from S, L, N, I, and V.

[1870] Aspect 660. The IL-2Rα ligand of any one of aspects 643 to 659, wherein X^2 is C.

[1871] Aspect 661. The IL-2Rα ligand of any one of aspects 643 to 660, wherein X^3 is R.

[1872] Aspect 662. The IL-2Rα ligand of any one of aspects 643 to 661, wherein X^4 is selected from L and V.

[1873] Aspect 663. The IL-2Rα ligand of any one of aspects 643 to 662, wherein X^5 is selected from R, K, and H.

[1874] Aspect 664. The IL-2Rα ligand of any one of aspects 643 to 663, wherein X^6 is selected from R, K, and H.

[1875] Aspect 665. The IL-2Rα ligand of any one of aspects 643 to 664, wherein X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1876] Aspect 666. The IL-2Rα ligand of any one of aspects 643 to 665, wherein X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1877] Aspect 667. The IL-2Rα ligand of any one of aspects 643 to 665, wherein X^8 is G.

[1878] Aspect 668. The IL-2Rα ligand of any one of aspects 643 to 667, wherein X^9 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1879] Aspect 669. The IL-2Rα ligand of any one of aspects 643 to 668, wherein X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1880] Aspect 670. The IL-2Rα ligand of any one of aspects 643 to 669, wherein X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1881] Aspect 671. The IL-2Rα ligand of any one of aspects 643 to 670, wherein X^{12} is selected from F, I, L, M, V, W, and Y.

[1882] Aspect 672. The IL-2Rα ligand of any one of aspects 643 to 670, wherein X^{12} is selected from F, W, and Y.

[1883] Aspect 673. The IL-2Rα ligand of any one of aspects 643 to 670, wherein X^{12} is W.

[1884] Aspect 674. The IL-2Rα ligand of any one of aspects 643 to 673, wherein X^{13} is E.

[1885] Aspect 675. The IL-2Rα ligand of any one of aspects 643 to 674, wherein X^{14} is C.

[1886] Aspect 676. The IL-2Rα ligand of any one of aspects 643 to 675, wherein X^{15} is selected from F, I, L, M, V, W, and Y.

[1887] Aspect 677. The IL-2Rα ligand of any one of aspects 643 to 675, wherein X^{15} is selected from L, I, and V.

[1888] Aspect 678. The IL-2Rα ligand of aspect 643, wherein X^2 is C, X^3 is R, X^{12} is W, X^{13} is E, and X^{14} is C.

[1889] Aspect 679. The IL-2Rα ligand of aspect 643, wherein,

X^2 is C;

X^3 is R;

X^4 is selected from F, I, L, M, V, W, and Y;

X^5 is selected from N, Q, S, T, and Y;

X^6 is selected from N, Q, S, T, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is selected from A, G, P, S, and T;

X^9 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} is W;

X^{13} is E;

X^{14} is C; and

X^{15} is selected from F, I, L, M, V, W, and Y.

[1890] Aspect 680. The IL-2Rα ligand of aspect 643, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 198 to SEQ ID NO: 204:

SEQ ID NO: 198	A	C	W	R	S	W	R	Y	P	T	R	T	F	C	S
SEQ ID NO: 199	K	C	R	L	R	Q	M	S	R	G	G	W	E	C	L
SEQ ID NO: 200	N	C	R	V	R	H	L	P	Y	P	F	W	S	C	L
SEQ ID NO: 201	R	C	R	L	Q	K	A	G	G	N	T	W	E	C	I
SEQ ID NO: 202	R	C	T	L	R	F	D	A	Q	T	G	W	E	C	N
SEQ ID NO: 203	T	C	R	L	K	R	S	G	P	N	S	W	E	C	I
SEQ ID NO: 204	T	C	T	V	H	R	I	G	L	A	E	W	E	C	V

[1891] Aspect 681. The IL-2Rα ligand of any one of aspects 643 to 680, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1892] Aspect 682. The IL-2Rα ligand of any one of aspects 680 to 681, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1893] Aspect 683. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (17a) (SEQ ID NO: 205), the amino acid sequence of Formula (17b) (SEQ ID NO: 206), or the amino acid sequence of Formula (17c) (SEQ ID NO: 207):

$$-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}- \quad (17a)$$

$$-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-C-X^{15}- \quad (17b)$$

$$-X^1-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-C\ X^{15}-X^{16}- \quad (17c)$$

wherein,

X^1 is selected from an amino acid comprising a large hydrophobic side chain;

X^2 is selected from an amino acid comprising a basic side chain;

X^3 is C;

X^4 is selected from an amino acid comprising a basic side chain;

X^5 is selected from an amino acid comprising a basic side chain or an aromatic side chain or a large hydrophobic side chain;

X^6 is selected from an amino acid;

X^7 is selected from an amino acid;

X^8 is P;

X^9 is G;

X^{10} is selected from an amino acid;

X^{11} is selected from an amino acid;

X^{12} is selected from an amino acid;

X^{13} is selected from an amino acid;

X^{14} is C;

X^{15} is selected from an amino acid comprising a large hydrophobic side chain; and

X^{16} is selected from an amino acid comprising a small hydrophobic side chain.

[1894] Aspect 684. The IL-2Rα ligand of aspect 683, wherein,

X^1 is selected from F, I, L, M, V, W, and Y;

X^2 is selected from H, K, and R;

X^3 is C;

X^4 is selected from H, K, and R;

X^5 is selected from F, H, I, K, L, M, R, V, W, and Y;

X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is P;

X^9 is G;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{14} is C;

X^{15} is selected from F, I, L, M, V, W, and Y; and

X^{1g} is selected from F, I, L, M, V, W, and Y.

[1895] Aspect 685. The IL-2Rα ligand of any one of aspects 683 to 684, wherein X^1 is V.

[1896] Aspect 686. The IL-2Rα ligand of any one of aspects 683 to 685, wherein X^2 is selected from K, R, T, and Y.

[1897] Aspect 687. The IL-2Rα ligand of any one of aspects 683 to 686, wherein X^3 is C.

[1898] Aspect 688. The IL-2Rα ligand of any one of aspects 683 to 687, wherein X^4 is selected from K, F, R, and Y.

[1899] Aspect 689. The IL-2Rα ligand of any one of aspects 683 to 688, wherein X^5 is selected from L, M, V, and R.

[1900] Aspect 690. The IL-2Rα ligand of any one of aspects 683 to 689, wherein X^6 is selected from V, S, A, L, and E.

[1901] Aspect 691. The IL-2Rα ligand of any one of aspects 683 to 690, wherein X^7 is selected from M, E, R, Y, V, and K.

[1902] Aspect 692. The IL-2Rα ligand of any one of aspects 683 to 691, wherein X^8 is P.

[1903] Aspect 693. The IL-2Rα ligand of any one of aspects 683 to 692, wherein X^9 is G.

[1904] Aspect 694. The IL-2Rα ligand of any one of aspects 683 to 693, wherein X^{10} is selected from S, R, L, Q, V, and G.

[1905] Aspect 695. The IL-2Rα ligand of any one of aspects 683 to 694, wherein X^{11} is selected from G, V, T, M, and E.

[1906] Aspect 696. The IL-2Rα ligand of any one of aspects 683 to 695, wherein X^{12} is selected from W, S, W, A, and M.

[1907] Aspect 697. The IL-2Rα ligand of any one of aspects 683 to 696, wherein X^{13} is selected from A, Y, E, V, and H.

[1908] Aspect 698. The IL-2Rα ligand of any one of aspects 683 to 697, wherein X^{14} is C.

[1909] Aspect 699. The IL-2Rα ligand of any one of aspects 683 to 697, wherein X^{14} is selected from H, T, L, V, F, and R.

[1910] Aspect 700. The IL-2Rα ligand of any one of aspects 683 to 697, wherein X^{14} is selected from F, A, and S.

[1911] Aspect 701. The IL-2Rα ligand of any one of aspects 683 to 700, wherein X^1 is V.

[1912] Aspect 702. The IL-2Rα ligand of any one of aspects 683 to 701, wherein X^2 is R.

[1913] Aspect 703. The IL-2Rα ligand of any one of aspects 683 to 702, wherein X^3 is C.

[1914] Aspect 704. The IL-2Rα ligand of any one of aspects 683 to 703, wherein X^4 is R.

[1915] Aspect 705. The IL-2Rα ligand of any one of aspects 683 to 704, wherein X^5 is selected from F, I, L, M, V, W, and Y.

[1916] Aspect 706. The IL-2Rα ligand of any one of aspects 683 to 704, wherein X^5 is selected from F, W, and Y.

[1917] Aspect 707. The IL-2Rα ligand of any one of aspects 683 to 704, wherein X^5 is selected from H, K, and R.

[1918] Aspect 708. The IL-2Rα ligand of any one of aspects 683 to 707, wherein X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1919] Aspect 709. The IL-2Rα ligand of any one of aspects 683 to 708, wherein X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1920] Aspect 710. The IL-2Rα ligand of any one of aspects 683 to 709, wherein X^8 is P.

[1921] Aspect 711. The IL-2Rα ligand of any one of aspects 683 to 710, wherein X^9 is G.

[1922] Aspect 712. The IL-2Rα ligand of any one of aspects 683 to 711, wherein X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1923] Aspect 713. The IL-2Rα ligand of any one of aspects 683 to 712, wherein X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1924] Aspect 714. The IL-2Rα ligand of any one of aspects 683 to 713, wherein X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1925] Aspect 715. The IL-2Rα ligand of any one of aspects 683 to 714, wherein X^{13} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1926] Aspect 716. The IL-2Rα ligand of any one of aspects 683 to 715, wherein X^{14} is C.

[1927] Aspect 717. The IL-2Rα ligand of any one of aspects 683 to 716, wherein X^{15} is selected from F, I, L, M, V, W, and Y.

[1928] Aspect 718. The IL-2Rα ligand of any one of aspects 683 to 717, wherein X^{16} is S.

[1929] Aspect 719. The IL-2Rα ligand of aspect 683, wherein X^{1} is V, X^{2}, is R, X^{3} is C, X^{4} is R, X^{14} is C, and X^{16} is S.

[1930] Aspect 720. The IL-2Rα ligand of aspect 683, wherein,

X^{1} is V;

X^{2} is R;

X^{3} is C;

X^{4} is R;

X^{5} is selected from H, F, I, K, L, M, R, V, W, and Y;

X^{6} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{7} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{8} is P;

X^{9} is G;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{14} is C;

X^{154} is selected from F, I, L, M, V, W, and Y; and

X^{16} is S.

[1931] Aspect 721. The IL-2Rα ligand of aspect 683, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 208 to SEQ ID NO: 213:

SEQ ID NO: 208	V	K	C	K	L	V	N	P	G	S	G	W	A	C	H	F
SEQ ID NO: 209	V	R	C	F	M	S	E	P	G	R	V	S	Y	C	T	A
SEQ ID NO: 210	V	R	C	R	L	A	R	P	G	L	T	W	E	C	L	S
SEQ ID NO: 211	V	R	C	R	V	L	Y	P	G	Q	M	A	V	C	V	S
SEQ ID NO: 212	V	T	C	Y	R	A	V	P	G	V	E	A	Y	C	F	S
SEQ ID NO: 213	V	Y	C	R	R	E	K	P	G	G	E	M	H	C	R	S

[1932] Aspect 722. The IL-2Rα ligand of any one of aspects 683 to 721, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1933] Aspect 723. The IL-2Rα ligand of any one of aspects 721 to 722, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1934] Aspect 724. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (18a) (SEQ ID NO: 214), the amino acid sequence of Formula (18b) (SEQ ID NO: 215), or the amino acid sequence of Formula (18c) (SEQ ID NO: 216):

$$-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}- \quad (18a)$$

$$-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-C-X^{15}- \quad (18b)$$

$$-X^1-X^2-C-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-X^{13}-C-X^{15}-X^{16}- \quad (18c)$$

wherein,

X^1 is selected from an amino acid;

X^2 is selected from an amino acid;

X^3 is C;

X^4 is selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^5 is selected from an amino acid comprising a large hydrophobic side chain;

X^6 is selected from an amino acid;

X^7 is selected from an amino acid;

X^8 is P;

X^9 is G;

X^{10} is selected from an amino acid;

X^{11} is selected from an amino acid;

X^{12} is selected from an amino acid;

X^{13} is selected from an amino acid comprising an aromatic side chain or a large hydrophobic side chain;

X^{14} is C;

X^{15} is selected from an amino acid; and

X^{16} is selected from an amino acid comprising a large hydrophobic side chain.

[1935] Aspect 725. The IL-2Rα ligand of aspect 724, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 is C;

X^4 is selected from F, H, I, L, M, V, W, and Y;

X^5 is selected from F, I, L, M, V, W, and Y;

X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is P;

X^9 is G;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} is selected from F, H, I, L, M, V, W, and Y;

X^{14} is C;

X^{15} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y; and

X^{1g} is selected from F, I, L, M, V, W, and Y.

[1936] Aspect 726. The IL-2Rα ligand of any one of aspects 724 to 725, wherein X^1 is selected from A, H, Q, R, T, and V.

[1937] Aspect 727. The IL-2Rα ligand of any one of aspects 724 to 726, wherein X^2 is selected from T, G, L, D, and K.

[1938] Aspect 728. The IL-2Rα ligand of any one of aspects 724 to 727, wherein X^3 is C.

[1939] Aspect 729. The IL-2Rα ligand of any one of aspects 724 to 728, wherein X^4 is selected from H, T, P, A, F, Q, and Y.

[1940] Aspect 730. The IL-2Rα ligand of any one of aspects 724 to 729, wherein X^5 is selected from L, W, G, I, E, M, and R.

[1941] Aspect 731. The IL-2Rα ligand of any one of aspects 724 to 730, wherein X^6 is selected from L, T, S, M, and N.

[1942] Aspect 732. The IL-2Rα ligand of any one of aspects 724 to 731, wherein X^7 is selected from A, K, D, E, W, T, and S.

[1943] Aspect 733. The IL-2Rα ligand of any one of aspects 724 to 732, wherein X^8 is P.

[1944] Aspect 734. The IL-2Rα ligand of any one of aspects 724 to 733, wherein X^9 is G.

[1945] Aspect 735. The IL-2Rα ligand of any one of aspects 724 to 734, wherein X^{10} is selected from V, A, S, T, D, Q, and V.

[1946] Aspect 736. The IL-2Rα ligand of any one of aspects 724 to 735, wherein X^{11} is selected from D, E, W, S, R, and I.

[1947] Aspect 737. The IL-2Rα ligand of any one of aspects 724 to 736, wherein X^{12} is selected from N, W, G, V, P, and A.

[1948] Aspect 738. The IL-2Rα ligand of any one of aspects 724 to 737, wherein X^{13} is selected from T, V, P, F, Y, and W.

[1949] Aspect 739. The IL-2Rα ligand of any one of aspects 724 to 738, wherein X^{14} is C.

[1950] Aspect 740. The IL-2Rα ligand of any one of aspects 724 to 738, wherein X^{14} is selected from I, S, P, D, H, T, and V.

[1951] Aspect 741. The IL-2Rα ligand of any one of aspects 724 to 738, wherein X^{14} is selected from F, L, N, I, T, and G.

[1952] Aspect 742. The IL-2Rα ligand of any one of aspects 724 to 741, wherein X^{1} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1953] Aspect 743. The IL-2Rα ligand of any one of aspects 724 to 742, wherein X^{2} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1954] Aspect 744. The IL-2Rα ligand of any one of aspects 724 to 743, wherein X^{3} is C.

[1955] Aspect 745. The IL-2Rα ligand of any one of aspects 724 to 744, wherein X^{4} is selected from F, H, I, L, M, V, W, and Y.

[1956] Aspect 746. The IL-2Rα ligand of any one of aspects 724 to 744, wherein X^{4} is selected from F, W, and Y.

[1957] Aspect 747. The IL-2Rα ligand of any one of aspects 724 to 746, wherein X^{5} is selected from F, I, L, M, V, W, and Y.

[1958] Aspect 748. The IL-2Rα ligand of any one of aspects 724 to 747, wherein X^{6} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1959] Aspect 749. The IL-2Rα ligand of any one of aspects 724 to 748, wherein X^{7} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1960] Aspect 750. The IL-2Rα ligand of any one of aspects 724 to 749, wherein X^{8} is P.

[1961] Aspect 751. The IL-2Rα ligand of any one of aspects 724 to 750, wherein X^{9} is G.

[1962] Aspect 752. The IL-2Rα ligand of any one of aspects 724 to 751, wherein X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1963] Aspect 753. The IL-2Rα ligand of any one of aspects 724 to 752, wherein X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1964] Aspect 754. The IL-2Rα ligand of any one of aspects 724 to 753, wherein X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1965] Aspect 755. The IL-2Rα ligand of any one of aspects 724 to 754, wherein X^{13} is selected from F, H, I, L, M, V, W, and Y.

[1966] Aspect 756. The IL-2Rα ligand of any one of aspects 724 to 754, wherein X^{13} is selected from F, W, and Y.

[1967] Aspect 757. The IL-2Rα ligand of any one of aspects 724 to 756, wherein X^{14} is C.

[1968] Aspect 758. The IL-2Rα ligand of any one of aspects 724 to 757, wherein X^{15} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1969] Aspect 759. The IL-2Rα ligand of any one of aspects 724 to 758, wherein X^{16} is selected from F, I, L, M, V, W, and Y.

[1970] Aspect 760. The IL-2Rα ligand of aspect 724, wherein X^3 is C, X^8 is P, X^9 is G, and X^{14} is C.

[1971] Aspect 761. The IL-2Rα ligand of aspect 724, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^3 is C;

X^4 is selected from F, H, W, and Y;

X^5 is selected from F, I, L, M, V, W, and Y;

X^6 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is P;

X^9 is G;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} is selected from F, H, W, and Y;

X^{14} is C;

X^{154} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y; and

X^{16} is selected from F, I, L, M, V, W, and Y.

[1972] Aspect 762. The IL-2Rα ligand of aspect 724, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 217 to SEQ ID NO: 224:

SEQ ID NO: 217	A	T	C	H	L	L	A	P	G	V	D	N	T	C	I	F
SEQ ID NO: 218	H	G	C	T	L	T	K	P	G	A	E	W	V	C	S	F
SEQ ID NO: 219	Q	L	C	P	W	S	D	P	G	S	W	G	P	C	P	L
SEQ ID NO: 220	R	D	C	A	G	M	E	P	G	T	S	V	F	C	D	N
SEQ ID NO: 221	R	D	C	F	I	L	E	P	G	T	S	V	Y	C	D	L
SEQ ID NO: 222	T	D	C	Q	E	T	W	P	G	D	R	P	W	C	H	I
SEQ ID NO: 223	V	K	C	F	M	S	T	P	G	Q	I	A	Y	C	T	T
SEQ ID NO: 224	V	K	C	Y	R	N	S	P	G	V	E	A	Y	C	V	G

[1973] Aspect 763. The IL-2Rα ligand of any one of aspects 724 to 762, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[1974] Aspect 764. The IL-2Rα ligand of any one of aspects 762 to 763, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[1975] Aspect 765. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (19a) (SEQ ID NO: 225), or the amino acid sequence of Formula (19b) (SEQ ID NO: 226):

$$–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}– \quad (19a)$$

$$–X^1–C–X^3–X^4–X^5–X^6–X^7–X^8–X^9–X^{10}–X^{11}–X^{12}–C–X^{14}– \quad (19b)$$

wherein,

X^1 is selected from an amino acid;

X^2 is C;

X^3 is selected from an amino acid comprising an acidic side chain or a polar/neutral side chain;

X^4 is selected from an amino acid comprising an acidic side chain or a polar/neutral side chain;

X^5 is selected from an amino acid comprising a large hydrophobic side chain;

X^6 is selected from an amino acid comprising a polar/neutral side chain;

X^7 is selected from an amino acid;

X^8 is selected from an amino acid;

X^9 is selected from an amino acid comprising a large hydrophobic side chain;

X^{10} is selected from an amino acid;

X^{11} is selected from an amino acid;

X^{12} is selected from an amino acid;

X^{13} is C; and

X^{14} is selected from an amino acid.

[1976] Aspect 766. The IL-2Rα ligand of aspect 765, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is C;

X^3 is selected from D, E, N, Q, S, T, and Y;

X^4 is selected from D, E, N, Q, S, T, and Y;

X^5 is selected from F, I, L, M, V, W, and Y;

X^6 is selected from N, Q, S, T, and Y;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 is selected from F, I, L, M, V, W, and Y;

X^{10} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{12} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^{13} is C; and

X^{14} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1977] Aspect 767. The IL-2Rα ligand of any one of aspects 765 to 766, wherein X^1 is selected from D, P, S, T, W, and Y.

[1978] Aspect 768. The IL-2Rα ligand of any one of aspects 765 to 767, wherein X^2 is C.

[1979] Aspect 769. The IL-2Rα ligand of any one of aspects 765 to 768, wherein X^3 is selected from L, Q, M, E, W, and H.

[1980] Aspect 770. The IL-2Rα ligand of any one of aspects 765 to 769, wherein X^4 is selected from D, R, S, E, and L.

[1981] Aspect 771. The IL-2Rα ligand of any one of aspects 765 to 770, wherein X^5 is selected from L, P, F, and V.

[1982] Aspect 772. The IL-2Rα ligand of any one of aspects 765 to 771, wherein X^6 is selected from R, A, K, H, and W.

[1983] Aspect 773. The IL-2Rα ligand of any one of aspects 765 to 772, wherein X^7 is selected from G, E, K, R, D, G, and Q.

[1984] Aspect 774. The IL-2Rα ligand of any one of aspects 765 to 773, wherein X^8 is selected from T, Y, S, M, Q, and D.

[1985] Aspect 775. The IL-2Rα ligand of any one of aspects 765 to 774, wherein X^9 is selected from V, Y, and D.

[1986] Aspect 776. The IL-2Rα ligand of any one of aspects 765 to 775, wherein X^{10} is selected from G, S, E, N, and Y.

[1987] Aspect 777. The IL-2Rα ligand of any one of aspects 765 to 776, wherein X^{11} is selected from M, Q, W, V, E, N, R, L, and M.

[1988] Aspect 778. The IL-2Rα ligand of any one of aspects 765 to 777, wherein X^{12} is selected from V, Q, W, V, E, N, R, L, and M.

[1989] Aspect 779. The IL-2Rα ligand of any one of aspects 765 to 778, wherein X^{13} is C.

[1990] Aspect 780. The IL-2Rα ligand of any one of aspects 765 to 779, wherein X^{14} is selected from Q, L, D, N, I, P, and F.

[1991] Aspect 781. The IL-2Rα ligand of any one of aspects 765 to 780, wherein X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[1992] Aspect 782. The IL-2Rα ligand of any one of aspects 765 to 781, wherein X^2 is C.

[1993] Aspect 783. The IL-2Rα ligand of any one of aspects 765 to 782, wherein X^3 is selected from H, N, Q, S, T, and Y.

[1994] Aspect 784. The IL-2Rα ligand of any one of aspects 765 to 783, wherein X^3 is selected from D and E.

[1995] Aspect 785. The IL-2Rα ligand of any one of aspects 765 to 783, wherein X^3 is selected from Q and E.

[1996] Aspect 786. The IL-2Rα ligand of any one of aspects 765 to 785, wherein X^4 is selected from D and E.

[1997] Aspect 787. The IL-2Rα ligand of any one of aspects 765 to 786, wherein X^5 is L.

[1998] Aspect 788. The IL-2Rα ligand of any one of aspects 765 to 787, wherein X^6 is selected from R, H, and K.

[1999] Aspect 789. The IL-2Rα ligand of any one of aspects 765 to 788, wherein X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[2000] Aspect 790. The IL-2Rα ligand of any one of aspects 765 to 789, wherein X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[2001] Aspect 791. The IL-2Rα ligand of any one of aspects 765 to 790, wherein X^9 is Y.

[2002] Aspect 792. The IL-2Rα ligand of any one of aspects 765 to 791, wherein X^{10} is selected from A, G, P, S, and T.

[2003] Aspect 793. The IL-2Rα ligand of any one of aspects 765 to 792, wherein X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y.

[2004] Aspect 794. The IL-2Rα ligand of any one of aspects 765 to 793, wherein X^{12} is selected from F, I, L, M, V, W, and Y.

[2005] Aspect 795. The IL-2Rα ligand of any one of aspects 765 to 793, wherein X^{12} is selected from V, L, and M.

[2006] Aspect 796. The IL-2Rα ligand of any one of aspects 765 to 795, wherein X^{13} is C.

[2007] Aspect 797. The IL-2Rα ligand of any one of aspects 765 to 796, wherein X^{14} is selected from F, I, L, M, V, W, and Y.

[2008] Aspect 798. The IL-2Rα ligand of any one of aspects 765 to 796, wherein X^{14} is selected from F, I, and L.

[2009] Aspect 799. The IL-2Rα ligand of any one of aspects 765 to 766, wherein X^2 is C, X^5 is L, and X^{13} is C.

[2010] Aspect 800. The IL-2Rα ligand of aspect 765, wherein,

X^1 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^2 is C;

X^3 is selected from D, E, N, Q, S, T, and Y;

X^4 is selected from D, E, N, Q, S, T, and Y;

X^5 is L;

X^6 is selected from A, G, H, K, P, S, and T;

X^7 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^8 is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y;

X^9 is selected from F, I, L, M, V, W, and Y;

X^{10} is selected from A, G, P, S, and T;

X^{11} is selected from A, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, and Y; and

X^{12} is selected from F, I, L, M, V, W, and Y;

X^{13} is C; and

X^{14} is selected from F, I, L, M, V, W, and Y.

[2011] Aspect 801. The IL-2Rα ligand of aspect 765, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 227 to SEQ ID NO: 234:

SEQ ID NO: 227	D	C	L	D	L	R	G	T	V	G	M	V	C	Q
SEQ ID NO: 228	P	C	Q	R	L	A	E	Y	Y	S	Q	Q	C	L
SEQ ID NO: 229	S	C	M	D	L	K	G	S	V	G	W	V	C	D
SEQ ID NO: 230	T	C	E	S	L	A	K	M	Y	E	V	E	C	N
SEQ ID NO: 231	T	C	E	S	L	A	R	M	Y	N	E	N	C	I
SEQ ID NO: 232	W	C	W	E	P	H	D	Q	Y	Y	V	R	C	P
SEQ ID NO: 233	Y	C	H	D	F	K	G	T	V	G	T	L	C	I
SEQ ID NO: 234	G	C	Q	L	V	W	Q	D	D	S	Y	M	C	F	Y

[2012] Aspect 802. The IL-2Rα ligand of any one of aspects 765 to 801, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[2013] Aspect 803. The IL-2Rα ligand of any one of aspects 801 to 802, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[2014] Aspect 804. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises the amino acid sequence of Formula (20a) (SEQ ID NO: 235), or the amino acid sequence of Formula (20b) (SEQ ID NO: 236):

$$-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}- \quad (20a)$$

$$-X^1-C-X^3-X^4-X^5-X^6-X^7-X^8-X^9-X^{10}-X^{11}-X^{12}-C-X^{14}- \quad (20b)$$

wherein,

X^1 is W;

X^2 is C;

X^3 is selected from F, I, L, M, V, W, and Y;

X^4 is G;

X^5 is Q;

X^6 is P;

X^7 is L;

X^8 is selected from F, I, L, M, V, W, and Y;

X^9 is R;

X^{10} is selected from H, N, Q, F, I, L, M, V, W, and Y;

X^{11} is G;

X^{12} is S;

X^{13} is C; and

X^{14} is K.

[2015] Aspect 805. The IL-2Rα ligand of aspect 804, wherein X^3 is selected from I and V.

[2016] Aspect 806. The IL-2Rα ligand of any one of aspects 804 to 805, wherein X^8 is selected from F and Y.

[2017] Aspect 807. The IL-2Rα ligand of any one of aspects 804 to 806, wherein X^{10} is selected from F, I, L, M, N, Q, S, T, V, W, and Y.

[2018] Aspect 808. The IL-2Rα ligand of any one of aspects 804 to 807, wherein X^{10} is selected from L and Q.

[2019] Aspect 809. The IL-2Rα ligand of aspect 804, wherein X^1 is W, X^2 is C, X^4 is G, X^5 is Q, X^6 is P, X^7 is L, X^9 is R, X^{11} is G, X^{12} is S, X^{13} is C, and X^{14} is K.

[2020] Aspect 810. The IL-2Rα ligand of aspect 804, wherein,

X^1 is W;

X^2 is C;

X^3 is selected from I and V;

X^4 is G;

X^5 is Q;

X^6 is P;

X^7 is L;

X^8 can be selected from F and Y;

X^9 is R;

X^{10} is selected from F, H, I, L, M, N, Q, S, T, V, W, and Y;

X^{11} is G;

X^{12} is S;

X^{13} is C; and

X^{14} is K.

[2021] Aspect 811. The IL-2Rα ligand of aspect 804, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 237 to SEQ ID NO: 307:

SEQ ID NO: 237	W	C	I	G	Q	P	L	F	R	Q	G	S	C	K
SEQ ID NO: 238	W	C	V	G	Q	P	L	Y	R	L	G	S	C	K
SEQ ID NO: 239	W	D	Q	F	Q	L	G	W	E	A	G	V	A	A
SEQ ID NO: 240	F	L	P	W	P	V	Y	F	S	Q	V	L	G	G	G

SEQ ID NO: 241	Y	V	M	C	S	A	F	G	C	K	S	I						
SEQ ID NO: 242	H	V	I	C	S	V	N	G	G	C	R	G						
SEQ ID NO: 243	I	R	F	C	L	R	S	E	P	T	A	C	W	I	V			
SEQ ID NO: 244	I	R	C	R	Y	E	K	Q	S	G	I	C	L	F				
SEQ ID NO: 245	G	G	C	S	L	V	W	A	D	S	W	V	C	I	F			
SEQ ID NO: 246	G	C	S	L	M	W	Q	D	G	W	W	V	C	I				
SEQ ID NO: 247	E	W	E	C	R	F	L	P	G	R	R	G	C	S	L	F		
SEQ ID NO: 248	K	G	C	T	L	Q	N	P	G	S	G	W	V	C	L	F		
SEQ ID NO: 249	T	C	R	L	K	R	S	G	P	N	S	W	E	C	I			
SEQ ID NO: 250	W	C	I	G	Q	P	L	F	R	Q	G	S	C	K				
SEQ ID NO: 251	A	V	S	C	N	S	W	R	C	I	P	W						
SEQ ID NO: 252	A	V	C	C	D	G	N	S	C	R	R	C						
SEQ ID NO: 253	F	V	H	C	S	L	M	G	C	W	C	G						
SEQ ID NO: 254	R	C	L	D	L	G	G	S	V	G	L	V	C	F				
SEQ ID NO: 255	V	C	F	N	F	R	G	T	V	G	R	H	C	W				
SEQ ID NO: 256	V	R	C	R	Q	N	E	P	G	G	A	Y	W	C	S	S		
SEQ ID NO: 257	C	V	L	R	E	G	A	E	G	W	E	C	V	W	R			
SEQ ID NO: 258	C	R	M	M	Q	G	T	Y	G	W	T	C	L	F				
SEQ ID NO: 259	C	I	L	N	D	T	I	Q	G	W	V	C	I	Y				
SEQ ID NO: 260	C	T	L	Y	R	S	A	P	G	V	W	L	C	I	F			
SEQ ID NO: 261	C	L	V	F	D	Q	Y	G	N	Y	K	R	R	C				
SEQ ID NO: 262	I	V	C	C	N	M	F	G	C	H	T	C	R	N				
SEQ ID NO: 263	Q	V	C	C	T	S	R	G	C	R	V	C	A	P	V			
SEQ ID NO: 264	R	V	C	C	S	M	V	G	C	R	S	C	N	L				
SEQ ID NO: 265	R	V	C	C	T	F	A	G	C	R	V	C	H	K				
SEQ ID NO: 266	R	V	C	C	T	S	D	G	C	R	G	C	R	Q				
SEQ ID NO: 267	T	V	C	C	T	V	Q	G	C	W	P	C	S	R				
SEQ ID NO: 268	V	C	C	H	Q	T	F	G	C	Y	R	C	K	Q				
SEQ ID NO: 269	C	V	V	C	S	A	L	G	C	R	A	C	V	P	R			
SEQ ID NO: 270	V	W	D	C	F	V	R	G	W	E	A	G	V	A	A	V	G	E
SEQ ID NO: 271	L	T	C	L	I	F	K	P	G	T	H	R	H	C	P	V		
SEQ ID NO: 272	R	Y	C	S	P	L	I	P	G	S	A	L	G	C	P	R		
SEQ ID NO: 273	I	R	C	R	L	D	P	P	G	S	Y	K	T	C	V	F		
SEQ ID NO: 274	R	G	V	I	C	N	H	A	G	C	R	I	W	Y	G			
SEQ ID NO: 275	T	T	Q	S	C	T	L	R	Y	C	W	L	L	Q				
SEQ ID NO: 276	W	W	I	S	C	L	R	D	L	R	C	L	E	Y	F			
SEQ ID NO: 277	R	H	A	C	K	T	W	Y	R	M	C	I	V	S				
SEQ ID NO: 278	A	V	S	C	S	R	L	T	G	R	C	H	S	L				
SEQ ID NO: 279	W	V	A	C	N	R	V	T	G	S	C	R	P	I				
SEQ ID NO: 280	S	H	G	V	C	C	T	Q	S	S	C	R	S	C	R			
SEQ ID NO: 281	W	V	A	C	N	R	L	S	G	C	C	R	P	I				
SEQ ID NO: 282	H	T	V	C	C	Q	D	W	G	C	R	S	C	S	G			
SEQ ID NO: 283	M	A	C	C	T	P	R	G	C	R	P	C						
SEQ ID NO: 284	R	S	V	C	C	S	S	Y	G	C	R	A	C	F	G			
SEQ ID NO: 285	C	K	L	T	C	T	S	S	T	C	S	C	V	F				
SEQ ID NO: 286	C	M	L	K	C	T	N	A	I	C	E	C	I	F				
SEQ ID NO: 287	C	R	V	W	C	N	Q	A	E	C	M	C	I	F				
SEQ ID NO: 288	S	R	C	S	F	D	V	T	K	Q	E	C	V	F				

SEQ ID NO: 289	L	E	C	Q	P	Y	R	G	P	L	Y	Y	C	Q	D	
SEQ ID NO: 290	S	I	C	C	T	P	Q	L	C	H	S	C	D	G		
SEQ ID NO: 291	T	T	C	C	T	S	E	G	C	H	K	C	I	T	L	
SEQ ID NO: 292	C	V	A	C	S	S	D	G	C	S	P	I	I	C		
SEQ ID NO: 293	A	I	C	S	E	D	E	G	G	E	L	C	C	W	H	
SEQ ID NO: 294	H	E	I	C	C	G	P	P	G	C	H	S	C	S	V	T
SEQ ID NO: 295	L	S	V	C	S	C	P	P	G	Q	L	Y	C	M	V	E
SEQ ID NO: 296	S	T	W	C	C	L	H	P	G	V	G	E	C	Q	A	V
SEQ ID NO: 297	V	T	Q	C	F	D	G	P	G	S	F	R	C	C	Y	Q
SEQ ID NO: 298	R	Q	C	N	C	L	S	P	G	E	L	V	N	C	Q	Q
SEQ ID NO: 299	M	V	S	C	T	D	L	G	C	V	V	V	G	G	G	
SEQ ID NO: 300	V	V	H	C	L	Q	S	G	C	Y	S	V	G	S	G	
SEQ ID NO: 301	T	I	K	C	G	S	S	G	W	C	W	V	E	A	G	
SEQ ID NO: 302	M	V	S	C	T	D	L	G	C	V	V	V	G	G	G	
SEQ ID NO: 303	H	E	I	C	C	G	P	P	G	C	H	S	C	S	V	T
SEQ ID NO: 304	L	S	V	C	S	C	P	P	G	Q	L	Y	C	M	V	E
SEQ ID NO: 305	S	T	W	C	C	L	H	P	G	V	G	E	C	Q	A	V
SEQ ID NO: 306	V	T	Q	C	F	D	G	P	G	S	F	R	C	C	Y	Q
SEQ ID NO: 307	R	Q	C	N	C	L	S	P	G	E	L	V	N	C	Q	Q

[2022] Aspect 812. The IL-2Rα ligand of any one of aspects 804 to 811, wherein,

the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini;

the amino acid sequence comprises a truncated amino acid sequence; or

the amino acid sequence comprises a truncated amino acid sequence, wherein the truncated amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[2023] Aspect 813. The IL-2Rα ligand of any one of aspects 811 to 812, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[2024] Aspect 814. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 400 to SEQ ID NO: 422:

SEQ ID NO: 400	W	D	D	F	I	L	G	W	E	A	G	V	A	A	V	G	E	V	
SEQ ID NO: 401	F	L	P	W	P	V	Y	F	S	Q	V	L	G	G	R	R			
SEQ ID NO: 402	Y	V	M	C	S	A	F	G	C	K	S	I	G	G					
SEQ ID NO: 403	H	V	I	C	S	V	N	G	G	C	R	G	G	G					
SEQ ID NO: 404	G	G	I	R	F	C	L	R	S	E	P	T	A	C	W	I	V	G	G
SEQ ID NO: 405	G	G	I	R	C	R	Y	E	K	Q	S	G	I	C	L	F	G	G	
SEQ ID NO: 403	G	G	G	G	C	S	L	V	W	A	D	S	W	V	C	I	F	G	G
SEQ ID NO: 406	G	G	G	C	S	L	M	W	Q	D	G	W	W	V	C	I	G	G	
SEQ ID NO: 407	G	G	E	W	E	C	R	F	L	P	G	R	R	G	C	S	L	F	G	G
SEQ ID NO: 408	G	G	K	G	C	T	L	Q	N	P	G	S	G	W	V	C	L	F	G	G
SEQ ID NO: 409	G	G	T	C	R	L	K	R	S	G	P	N	S	W	E	C	I	G	G	
SEQ ID NO: 410	G	G	W	C	I	G	Q	P	L	F	R	Q	G	S	C	K	G	G	
SEQ ID NO: 411	F	V	L	C	G	L	Q	G	C	R	S	G	G						

SEQ ID NO: 412	F	V	P	W	D	E	Y	F	L	Q	I	L	G	G						
SEQ ID NO: 413	G	G	G	W	V	I	C	S	A	L	G	C	P	F	G	G				
SEQ ID NO: 414	G	G	G	R	R	F	C	L	R	S	E	P	T	A	C	W	T	V	G	G
SEQ ID NO: 415	G	G	G	S	R	C	S	L	V	W	A	D	S	W	V	C	I	F	G	G
SEQ ID NO: 416	G	G	D	W	E	C	L	F	L	P	G	R	R	G	C	T	L	F	G	G
SEQ ID NO: 417	F	I	P	W	D	E	Y	F	A	Q	L	L	G	G						
SEQ ID NO: 418	F	V	P	W	D	V	Y	F	S	Q	I	L	G	G						
SEQ ID NO: 419	F	I	P	W	D	E	Y	F	K	Q	V	L	G	G						
SEQ ID NO: 420	F	V	P	W	P	E	Y	F	L	Q	I	M	G	G						
SEQ ID NO: 421	F	I	P	W	E	E	Y	F	S	Q	L	L	G	G						
SEQ ID NO: 422	F	I	P	W	P	E	Y	F	S	Q	L	L	G	G						

[2025] Aspect 815. The IL-2Rα ligand of aspect 814, wherein the amino acid sequence comprises a truncated amino acid sequence.

[2026] Aspect 816. The IL-2Rα ligand of any one of aspects 814 to 815, wherein the amino acid sequence independently comprises from 1 to 4 glycines (G) on the N-terminus, on the C-terminus, or on both the N- and C-termini.

[2027] Aspect 817. The IL-2Rα ligand of any one of aspects 814 to 816, wherein from 1 to 5 of the amino acids is independently substituted with another amino acid.

[2028] Aspect 818. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NO: 1 to SEQ ID NO: 307 and SEQ ID NO. 400 to SEQ ID NO: 422.

[2029] Aspect 819. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises an amino acid sequence having greater than 70%, greater than 75%, greater than 80%, greater than 85%, greater than 90%, or greater than 95% sequence similarity to any one of SEQ ID NO: 1 to SEQ ID NO: 307 and SEQ ID NO. 400 to SEQ ID NO: 422.

[2030] Aspect 820. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises a truncated amino acid sequence of any one of SEQ ID NO: 1 to SEQ ID NO: 307 and SEQ ID NO. 400 to SEQ ID NO: 422.

[2031] Aspect 821. The IL-2Rα ligand of any one of aspects 1 to 6, wherein the IL-2Rα ligand comprises an amino acid sequence having greater than 70%, greater than 75%, greater than 80%, greater than 85%, greater than 90%, or greater than 95% sequence similarity to a truncated amino acid sequence of any one of SEQ ID NO: 1 to SEQ ID NO: 307 and SEQ ID NO. 400 to SEQ ID NO: 422.

[2032] Aspect 822. A compound comprising an IL-2Rα ligand of any one of aspects 1 to 821.

[2033] Aspect 823. The compound of aspect 822, wherein the compound is selected from a peptide, a conjugate, a fusion protein, and a single chain tandem peptide.

[2034] Aspect 825. The compound of aspect 823, wherein the compound is a peptide.

[2035] Aspect 825. The compound of aspect 824, wherein the peptide has a molecular weight within a range from 500 Daltons to 15,000 Daltons.

[2036] Aspect 826. The compound of any one of aspects 825 to 826, wherein the peptide comprises from 5 amino acids to 4,000 amino acids.

[2037] Aspect 827. The compound of aspect 823, wherein the compound comprises a conjugate.

[2038] Aspect 828. The compound of aspect 827, wherein the conjugate comprises at least one IL-2Rα ligand.

[2039] Aspect 829. The compound of aspect 827, wherein the conjugate comprises: at least two IL-2Rα ligands; and at least one linker attached to each of the at least two IL-2Rα ligands.

[2040] Aspect 830. The compound of any one of aspects 823 to 829, wherein the conjugate comprises at least one IL-2Rβ ligand and/or at least one IL-2Rγc ligand.

[2041] Aspect 831. The compound of any one of aspects 823 to 829, wherein the conjugate comprises: at least two IL-2Rβ ligands; and at least one linker attached to each of the at least two IL-2Rβ ligands.

[2042] Aspect 832. The compound of aspect 823, wherein the conjugate comprises: at least two IL-2Rγc ligands; and at least one linker attached to each of the at least two IL-2Rγc ligands.

[2043] Aspect 833. The compound of aspect 823, wherein the conjugate comprises: at least one IL-2Rβ ligand; at least one IL-2Rγc ligand; and at least one linker attached to the at least one IL-2Rβ ligand and to the at least one IL-2Rγc ligand.

[2044] Aspect 834. The compound of any one of aspects 823 to 833, wherein the conjugate comprises at least one moiety, amino acid, or polypeptide configured to modify a property of the conjugate.

[2045] Aspect 835. The compound of aspect 834, wherein the property is selected from aqueous solubility, polarity, lipophilicity, pharmacokinetic profile, targeting, bioavailability, pH-dependent binding, bioactivity, pharmacodynamics, cellular activity, metabolism, therapeutic efficacy, and caging (reversible incapacitation).

[2046] Aspect 836. The compound of any one of aspects 834 to 835, wherein the at least one moiety is cleavable *in vivo*.

[2047] Aspect 837. The compound of any one of aspects 834 to 836, wherein the at least one moiety comprises an irreversibly cleavable promoiety.

[2048] Aspect 838. The compound of aspect 837, wherein the promoiety is configured to be releasable in a target-specific environment.

[2049] Aspect 839. The compound of aspect 838, wherein the target-specific environment comprises an enzyme, pH, or a combination thereof.

[2050] Aspect 840. The compound of any one of aspects 834 to 839, wherein the moiety comprises a small molecule, polymer, a peptide, or an antibody.

[2051] Aspect 841. The compound of any one of aspects 834 to 840, wherein the moiety comprises a pharmacokinetic moiety.

[2052] Aspect 842. The compound of aspect 841, wherein the pharmacokinetic moiety comprises a polyethylene glycol.

[2053] Aspect 843. The compound of any one of aspects 834 to 842, wherein the moiety comprises a tumor-targeting moiety.

[2054] Aspect 844. The compound of aspect 843, wherein the tumor-targeting moiety comprises a tumor-specific antibody, a tumor-specific antibody fragment, a tumor-specific protein, or a tumor-specific peptide.

[2055] Aspect 845. The compound of any one of aspects 834 to 844, wherein the moiety comprises an immune cell-targeting moiety.

[2056] Aspect 846. The compound of any one of aspects 822 to 845, wherein the compound comprises a linker covalently bound to the IL-2Rα ligand.

[2057] Aspect 847. The compound of aspect 846, wherein the linker is selected from a peptide having from 2 amino acids to 200 amino acids.

[2058] Aspect 848. The compound of any one of aspects 846 to 847, wherein the linker comprises a polyethylene glycol.

[2059] Aspect 849. The compound of any one of aspects 822 to 848, wherein the compound comprises a heteromer, wherein the heteromer comprises:

an IL-2Rα ligand;

an IL-2Rβ ligand;

an IL-2Rγc ligand; and

a linker;

wherein each of the IL-2Rα ligand, the IL-2Rβ ligand and the IL-2Rγc ligand comprise an amino-terminus (N-terminus), a carboxy terminus (C-terminus), and an amino acid side chain;

wherein the IL-2Rα ligand is bonded to the linker through the amino-terminus (N-terminus), the carboxy terminus (C-terminus), an amino acid side chain, or a combination of any of the foregoing; and

wherein the IL-2Rβ ligand is bonded to the linker through the amino-terminus (N-terminus), the carboxy terminus (C-terminus), an amino acid side chain, or a combination of any of the foregoing; and

wherein the IL-2Rγc ligand is bonded to the linker through the amino-terminus (N-terminus), the carboxy terminus (C-terminus), an amino acid side chain, or a combination of any of the foregoing.

[2060] Aspect 850. The compound of any one of aspects 822 to 848, wherein the compound comprises a heteromer, wherein the heteromer comprises:

an IL-2Rα ligand;

an IL-2Rβ ligand;

an IL-2Rγc ligand; and

a linker;

wherein each of the IL-2Rα ligand, the IL-2Rβ ligand, and the IL-2Rγc ligand comprises an amino-terminus (N-terminus) and a carboxy terminus (C-terminus); and

wherein each of the IL-2Rα ligand, the IL-2Rβ ligand, and the IL-2Rγc ligand is covalently bound to the linker.

[2061] Aspect 851. The compound of aspect 850, wherein each of the IL-2Rα ligand, the IL-2Rβ ligand, and the IL-2Rγc ligand is covalently bound to the linker through the respective C-terminus and/or through the respective N-terminus.

[2062] Aspect 852. The compound of aspect 850, wherein,

the IL-2Rα ligand is covalently bound to the linker through an amino acid side chain;

the IL-2Rβ ligand is covalently bound to the linker through an amino acid side chain; and/or

the IL-2Rγc ligand is covalently bound to the linker through an amino acid side chain.

[2063] Aspect 853. The compound of aspect 850, wherein,

the IL-2Rα ligand is covalently bound to the linker through an amino acid side chain, through the C-terminus, or through the N-terminus;

the IL-2Rβ ligand is covalently bound to the linker through an amino acid side chain, through the C-terminus, or through the N-terminus; and

the IL-2Rγc ligand is covalently bound to the linker through an amino acid side chain, through the C-terminus, or through the N-terminus.

[2064] Aspect 854. The compound of any one of aspects 850 to 853, wherein the heteromer is configured to activate the IL-2 receptor.

[2065] Aspect 855. The compound of any one of aspects 850 to 853, wherein the linker is configured such that the heteromer activates the IL-2 receptor.

[2066] Aspect 856. The compound of any one of aspects 822 to 855, wherein the compound is an IL-2R agonist.

[2067] Aspect 857. The compound of any one of aspects 822 to 855, wherein the compound is an IL-2R antagonist.

[2068] Aspect 858. The compound of any one of aspects 822 to 855, wherein the compound comprises a conformation configured to activate human IL-2Rβγc signaling pathways.

[2069] Aspect 859. The compound of any one of aspects 822 to 858, wherein the compound comprises a single chain peptide.

[2070] Aspect 860. The compound of aspect 859, wherein the single chain peptide comprises at least one IL-2Rβ ligand.

[2071] Aspect 861. The compound of any one of aspects 859 to 860, wherein the single chain peptide comprises: at least two IL-2Rβ ligands; and at least one linker attached to the at least two IL-2Rβ ligands.

[2072] Aspect 862. The compound of any one of aspects 859 to 861, wherein the single chain peptide comprises a least one IL-2Rγc ligand.

[2073] Aspect 863. The compound of any one of aspects 859 to 862, wherein the single chain peptide comprises: at least two IL-2Rγc ligands; and at least one linker attached to the at least two IL-2Rγc ligands.

[2074] Aspect 864. The compound of any one of aspects 859 to 863, wherein the single chain tandem peptide comprises:

at least one IL-2Rα ligand;

at least one IL-2Rβ ligand;

at least one IL-2Rγc ligand; and

at least one linker attached to the at least one IL-2Rα ligand, to the at least one IL-2Rβ ligand, and to the at least one IL-2Rγc ligand.

[2075] Aspect 865. The compound of any one of aspects 822 to 864, wherein the compound is a fusion protein.

[2076] Aspect 866. The compound of aspect 865, wherein the fusion protein comprises:

at least one IL-2Rα ligand;

at least one IL-2Rβ ligand;

at least one IL-2Rγc ligand; and

a peptide linker domain, wherein the peptide linker domain is bound to the at least one IL-2Rα ligand, to the at least one IL-2Rβ ligand, and to the at least one IL-2Rγc ligand.

[2077] Aspect 867. The compound of aspect 865, wherein,

each peptide linker domain has an amino-terminus (N-terminus) and a carboxy terminus (C-terminus); and

the C-terminus of the IL-2Rα ligand is fused through a peptide bond to the N-terminus of the peptide linker domain, and the C-terminus of the peptide linker domain is fused to a protein fusion partner.

[2078] Aspect 868. The compound of aspect 867, wherein the protein fusion partner comprises an IgG molecule, an IgG Fab fragment, or an Fc fragment,

[2079] Aspect 868. The compound of any one of aspects 867 to 868, wherein the protein fusion partner comprises IL-2, a variant of IL-2, a mutant of IL-2, or an IL-2R agonist.

[2080] Aspect 870. The compound of aspect 865, wherein,

each peptide linker domain has an amino-terminus (N-terminus) and a carboxy terminus (C-terminus); and

the N-terminus of the IL-2Rα ligand is fused through a peptide bond to the C-terminus of the peptide linker domain, and the N-terminus of the peptide linker domain is fused to a protein fusion partner.

[2081] Aspect 871. The compound of aspect 870 wherein the protein fusion partner comprises an IgG molecule, an IgG Fab fragment, or an Fc fragment,

[2082] Aspect 872. The compound of any one of aspects 870 to 871, wherein the protein fusion partner comprises IL-2, a variant of IL-2, a mutant of IL-2, or an IL-2R agonist.

[2083] Aspect 873. A nucleic acid encoding the fusion protein of aspect 865.

[2084] Aspect 874. The compound of any one of aspects 822 to 872, wherein the compound comprises a label.

[2085] Aspect 875. The compound of aspect 874, wherein the label is selected from a radioisotope, a fluorophore, or a combination thereof.

[2086] Aspect 876. The compound of any one of aspects 822 to 875, wherein the compound comprises a cage to protect peripheral tissues for the toxicity of IL-2R activation.

[2087] Aspect 877. The compound of any one of aspects 822 to 876, wherein the compound comprises a promoiety.

[2088] Aspect 878. The compound of aspect 877, wherein the promoiety comprises a moiety configured to sustain a circulating reservoir of the compound.

[2089] Aspect 879. The compound of any one of aspects 822 to 878, wherein the compound comprises a moiety configured to target IL-2R-directed immuno-stimulation of the effector immune cells in the tumor.

[2090] Aspect 880. The compound of any one of aspects 822 to 879, wherein the compound comprises a cleavable moiety.

[2091] Aspect 881. The compound of aspect 880, wherein the cleavable moiety is cleavable by electromagnetic radiation, thermal energy, pH, or a combination of any of the foregoing.

[2092] Aspect 882. The compound of any one of aspects 822 to 881, wherein the compound comprises a moiety that is toxic to cells having high IL-2Rα expression.

[2093] Aspect 883. The compound of aspect 882, wherein the cells having high IL-2Rα expression are Treg cells.

[2094] Aspect 884. The compound of aspect 882, wherein the toxic moiety is a cleavable moiety.

[2095] Aspect 885. The compound of aspect 884, the cleavable moiety is cleavable by electromagnetic radiation, thermal energy, pH, or a combination of any of the foregoing.

[2096] Aspect 886. The compound of any one of aspects 882 to 885, wherein the toxic moiety is activated by electromagnetic radiation, thermal energy, pH, or a combination of any of the foregoing.

[2097] Aspect 887. The compound of any one of aspects 822 to 886, wherein the compound comprises an imaging agent, a diagnostic agent, a targeting agent, a therapeutic agent, or a combination of any of the foregoing.

[2098] Aspect 888. A pharmaceutical composition comprising;

the IL-2Rα ligand of any one of aspects 1 to 821;

a compound of any one of aspects 822 to 887; or

a combination of any of the foregoing.

[2099] Aspect 889. A method of treating cancer in a patient, comprising administering to a patient in need of such treatment, a therapeutically effective amount of the pharmaceutical composition of aspect 880.

[2100] Aspect 890. A method of treating cancer in a patient, comprising administering to a patient in need of such treatment, a therapeutically effective amount of;

the IL-2Rα ligand of any one of aspects 1 to 821;

the compound of any one of aspects 822 to 887; or

a combination of any of the foregoing.

[2101] Aspect 891. The method of any one of aspects 889 and 890, wherein the cancer comprises a solid tumor.

[2102] Aspect 892. A method of treating an autoimmune disease in a patient, comprising administering to a patient in need of such treatment, a therapeutically effective amount of the pharmaceutical composition of aspect 888.

[2103] Aspect 893. A method of treating an autoimmune disease in a patient, comprising administering to a patient in need of such treatment, a therapeutically effective amount of;

the IL-2Rα ligand of any one of aspects 1 to 821;

the compound of any one of aspects 822 to 887; or

a combination of any of the foregoing.

[2104] Aspect 894. A method of treating an autoimmune disease in a patient, comprising administering to a patient in need of such treatment, a therapeutically effective amount of the pharmaceutical composition of aspect 888.

[2105] Aspect 895. A method of treating an autoimmune disease in a patient, comprising administering to a patient in need of such treatment, a therapeutically effective amount of;

the IL-2Rα ligand of any one of aspects 1 to 821;

the compound of any one of aspects 822 to 8887; or

a combination of any of the foregoing.

[2106] Aspect 896. A method of screening compounds for IL-2α activity, comprising:

contacting a cell with,

the IL-2Rα ligand of any one of aspects 1 to 821;

the compound of any one of aspects 822 to 887; or

a combination of any of the foregoing.

wherein the cell expresses the IL-2α subunit; and

contacting the cell with a test compound; and

determining the activity of the test compound.

[2107] Aspect 897. A method of activating the human IL-2 receptor, comprising contacting a cell expressing the human IL-2 receptor *in vivo* with the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2108] Aspect 898. A method of activating the human IL-2 receptor in a patient, comprising administering to a patient an effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2109] Aspect 899. A method of treating a disease in a patient, wherein the IL-2 receptor signaling pathway is associated with the etiology of the disease, comprising administering to a patient in need of such treatment a therapeutically effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2110] Aspect 900. A method of treating a disease in a patient, wherein activation of the IL-2 receptor is effective in treating the disease, comprising administering to a patient in need of such treatment a therapeutically effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2111] Aspect 901. A method of treating a disease in a patient, wherein inhibition of the IL-2 receptor is effective in treating the disease, comprising administering to a patient in need of such treatment a therapeutically effective amount the IL-2Rα ligand of any one of aspects 1 to 821 or of a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2112] Aspect 902. A method of treating a disease in a patient, wherein cells expressing the IL-2Rα subunit (CD25) are associated with the etiology of the disease, comprising administering to a patient in need of such treatment a therapeutically effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2113] Aspect 903. A method of treating a disease in a patient, wherein binding to the IL-2Rα subunit (CD25) is effective in treating the disease, comprising administering to a patient in need of such treatment a therapeutically effective amount the IL-2Rα ligand of any one of aspects 1 to 821 or of a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2114] Aspect 904. A method of treating a disease in a patient, wherein inhibiting binding of an IL-2R agonist to the IL-2Rα subunit (CD25) is effective in treating the disease, comprising administering to a patient in need of such treatment a therapeutically effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2115] Aspect 905. A method of treating a disease in a patient, wherein reducing the sensitivity of Treg cells to IL-2 is effective in treating the disease, comprising administering to a patient in need of such treatment a therapeutically effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2116] Aspect 906. A method of treating a disease in a patient, wherein inhibiting binding to the IL-2Rα subunit (CD25) is effective in treating the disease, comprising administering to a patient in

need of such treatment a therapeutically effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2117] Aspect 907. A method of treating a disease in a patient, wherein the etiology of the disease is associated with activation of Treg cells, comprising administering to a patient in need of such treatment a therapeutically effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2118] Aspect 908. A method of treating a disease in a patient, wherein the etiology of the disease is associated with cells exhibiting a high IL-2Rα expression, comprising administering to a patient in need of such treatment a therapeutically effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2119] Aspect 909. A method of imaging cells expressing the IL-2Rα subunit comprising administering to a patient an effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2120] Aspect 910. A method of diagnosing a disease in a patient wherein the disease is associated with cells expressing the IL-2Rα subunit comprising administering to a patient an effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2121] Aspect 911. A method of targeting a compound to cells expressing the IL-2Rα subunit comprising administering to a patient an effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising the IL-2Rα ligand of any one of aspects 1 to 821.

[2122] Aspect 912. A method of delivering a cytotoxic compound to cells expressing the IL-2Rα subunit comprising administering to a patient an effective amount of the IL-2Rα ligand of any one of aspects 1 to 821 or a compound comprising a cytotoxic moiety and the IL-2Rα ligand of any one of aspects 1 to 821.

[2123] Aspect 913. The method of any one of aspects 897 to 912, wherein the compound comprises the compound of any one of aspects 822 to 887.

[2124] Finally, it should be noted that there are alternative ways of implementing the embodiments disclosed herein. Accordingly, the present embodiments are to be considered as illustrative and not restrictive, and the claims are not to be limited to the details given herein but may be modified within the scope and equivalents thereof.

SEQ ID TABLE

SEQ ID NO: 1	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}
SEQ ID NO: 2	L	D	L	T	Y	D	E	L	L	A	C	T
SEQ ID NO: 3	W	A	Y	D	W	S	C	F	R	R	R	L
SEQ ID NO: 4	F	L	H	W	P	V	Y	F	C	Q	V	M
SEQ ID NO: 5	F	L	P	W	P	V	Y	F	S	Q	V	L
SEQ ID NO: 6	F	V	E	W	Q	A	Y	F	S	Q	M	M
SEQ ID NO: 7	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}
SEQ ID NO: 8	F	I	P	W	D	E	Y	F	A	Q	L	L
SEQ ID NO: 9	F	I	P	W	D	E	Y	F	K	Q	V	L
SEQ ID NO: 10	F	V	P	W	D	V	Y	F	S	Q	I	L
SEQ ID NO: 11	F	I	P	W	D	E	Y	F	K	Q	V	L
SEQ ID NO: 12	F	V	P	W	P	E	Y	F	L	Q	I	M
SEQ ID NO: 13	F	I	P	W	E	E	Y	F	S	Q	L	L
SEQ ID NO: 14	F	I	P	W	P	E	Y	F	S	Q	L	L
SEQ ID NO: 15	F	V	P	W	D	E	Y	F	L	Q	I	L
SEQ ID NO: 16	X^5	X^6	X^7	X^8								
SEQ ID NO: 17	X^3	C	X^5	X^6	X^7	X^8	C	X^{10}				
SEQ ID NO: 18	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}
SEQ ID NO: 19	F	V	L	C	G	L	Q	G	C	R	G	S
SEQ ID NO: 20	K	V	I	C	G	W	D	G	C	R		
SEQ ID NO: 21	L	V	F	C	G	K	N	G	C	H	S	G
SEQ ID NO: 22	V	V	L	C	T	P	K	G	C	R	S	A
SEQ ID NO: 23	Y	V	M	C	S	A	F	G	C	K	S	I
SEQ ID NO: 24	F	V	H	C	T	L	L	G	C	W	S	G
SEQ ID NO: 25	X^5	X^6	X^7	X^8	X^9							
SEQ ID NO: 26	X^3	C	X^5	X^6	X^7	X^8	C	X^{10}				
SEQ ID NO: 27	X^2	X^3	C	X^5	X^6	X^7	X^8	C	X^{10}	X^{11}		
SEQ ID NO: 28	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}

SEQ ID NO: 29	W	V	I	C	S	A	L	G	C	R	S	L			
SEQ ID NO: 30	W	V	I	C	S	A	L	G	C	R	S	M			
SEQ ID NO: 31	W	V	I	C	S	A	V	G	C	R	P	F			
SEQ ID NO: 32	W	V	I	C	S	A	M	G	C	R	S	I			
SEQ ID NO: 33	W	V	I	C	S	A	L	G	C	R	S	I			
SEQ ID NO: 34	W	V	I	C	S	A	F	G	C	R	S	M			
SEQ ID NO: 35	W	V	I	C	S	A	L	G	C	R	P	F			
SEQ ID NO: 36	W	V	I	C	S	A	L	G	C	K	A	W			
SEQ ID NO: 37	X^5	X^6	X^7	X^8	X^9										
SEQ ID NO: 38	X^3	C	X^5	X^6	X^7	X^8	X^9	C	X^{11}						
SEQ ID NO: 39	X^3	X^4	C	X^5	X^6	X^7	X^8	X^9	C	X^{11}	X^{12}				
SEQ ID NO: 40	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}			
SEQ ID NO: 41	Y	V	L	C	S	N	R	N	G	C	R	P			
SEQ ID NO: 42	Y	V	T	C	R	W	G	Y	G	C	T	R			
SEQ ID NO: 43	W	V	A	C	S	W	D	H	G	C	R	S			
SEQ ID NO: 44	H	V	I	C	S	V	N	G	G	C	R	G			
SEQ ID NO: 45	W	V	X	C	K	P	L	H	G	C	Y	G			
SEQ ID NO: 46	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}								
SEQ ID NO: 47	X^3	C	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	C	X^{13}				
SEQ ID NO: 48	X^2	X^3	C	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	C	X^{13}	X^{14}		
SEQ ID NO: 49	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	X^{14}	X^{15}
SEQ ID NO: 50	E	Q	F	C	L	V	S	D	P	M	A	C	W	S	L
SEQ ID NO: 51	K	Y	W	C	L	R	S	E	P	D	A	C	F	A	T
SEQ ID NO: 52	R	V	Y	C	L	A	S	E	P	N	S	C	W	S	T
SEQ ID NO: 53	T	K	L	C	L	K	S	E	P	Q	A	C	W	S	M
SEQ ID NO: 54	I	R	F	C	L	R	S	E	P	T	A	C	W	I	V
SEQ ID NO: 55	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}								
SEQ ID NO: 56	X^3	C	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	C	X^{13}				
SEQ ID NO: 57	X^2	X^3	C	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	C	X^{13}	X^{14}		
SEQ ID NO: 58	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	X^{14}	X^{15}
SEQ ID NO: 59	R	R	F	C	L	R	S	E	P	T	A	C	W	I	V

SEQ ID NO: 60	K	L	F	C	L	R	S	G	D	R	A	C	W	V	V
SEQ ID NO: 61	M	R	F	C	L	R	S	E	P	T	A	C	W	T	V
SEQ ID NO: 62	R	R	F	C	L	R	S	E	P	T	A	C	W	D	V
SEQ ID NO: 63	R	R	F	C	L	R	S	D	P	T	A	C	W	I	V
SEQ ID NO: 64	K	R	F	C	L	R	S	E	P	T	A	C	W	T	V
SEQ ID NO: 65	R	R	F	C	L	R	S	E	P	M	A	C	W	T	V
SEQ ID NO: 66	R	R	F	C	L	R	S	E	P	T	A	C	W	T	V
SEQ ID NO: 67	R	R	F	C	L	R	S	E	P	A	A	C	W	F	V
SEQ ID NO: 68	R	R	F	C	L	R	S	E	P	T	A	C	W	Y	V
SEQ ID NO: 69	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}							
SEQ ID NO: 70	X^2	C	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	C	X^{13}			
SEQ ID NO: 71	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	X^{14}	
SEQ ID NO: 72	R	S	C	N	R	Y	G	I	W	G	H	C	D	T	
SEQ ID NO: 73	I	K	C	R	V	L	E	A	G	T	P	C	V	F	
SEQ ID NO: 74	I	R	C	R	Y	E	K	Q	S	G	I	C	L	F	
SEQ ID NO: 75	L	R	C	R	L	D	T	R	D	G	T	C	R	F	
SEQ ID NO: 76	M	R	C	I	L	S	P	S	R	E	H	C	L	F	
SEQ ID NO: 77	N	H	C	T	M	D	W	R	L	G	A	C	I	F	
SEQ ID NO: 78	S	G	C	R	L	S	L	L	D	G	H	C	Y	F	
SEQ ID NO: 79	S	K	C	V	Y	D	Y	N	F	G	T	C	I	F	
SEQ ID NO: 80	S	R	C	V	M	S	L	Q	L	G	A	C	I	F	
SEQ ID NO: 81	T	R	C	T	V	I	G	P	P	W	S	C	R	F	
SEQ ID NO: 82	V	F	C	I	G	Y	G	A	A	Q	S	C	H	S	
SEQ ID NO: 83	V	R	C	L	Y	D	S	I	T	R	T	C	T	F	
SEQ ID NO: 84	V	S	C	K	I	D	R	R	S	G	S	C	L	F	
SEQ ID NO: 85	V	S	C	R	F	R	P	D	L	G	F	C	I	F	
SEQ ID NO: 86	D	R	C	D	T	R	T	W	G	Y	Y	C	W	I	
SEQ ID NO: 87	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}							
SEQ ID NO: 88	X^3	C	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	C	X^{14}			
SEQ ID NO: 89	X^2	X^3	C	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	C	X^{14}	X^{15}	
SEQ ID NO: 90	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	X^{14}	X^{15}	X^{16}

SEQ ID NO: 91	G	S	R	C	Y	W	D	P	G	R	E	V	C	I	F	K
SEQ ID NO: 92	E	W	E	C	R	F	L	P	G	R	R	G	C	S	L	F
SEQ ID NO: 93	F	W	E	C	V	Y	S	P	G	S	R	G	C	R	M	V
SEQ ID NO: 94	G	F	R	C	T	Y	D	P	G	T	H	S	C	W	S	I
SEQ ID NO: 95	K	W	I	C	R	L	V	P	G	N	G	A	C	H	S	F
SEQ ID NO: 96	P	W	V	C	E	H	Y	P	G	R	R	G	C	V	L	M
SEQ ID NO: 97	Q	W	S	C	V	F	S	P	G	V	R	G	C	K	L	V
SEQ ID NO: 98	R	F	I	C	R	I	Q	P	G	R	E	G	C	W	S	L
SEQ ID NO: 99	R	W	E	C	I	Y	I	P	G	R	K	G	C	T	L	Q
SEQ ID NO: 100	S	L	N	C	K	T	R	P	G	L	R	W	C	T	W	T
SEQ ID NO: 101	S	W	E	C	V	Y	M	P	G	H	Q	G	C	R	L	F
SEQ ID NO: 102	V	R	F	C	R	S	G	P	G	W	V	S	C	G	T	Q
SEQ ID NO: 103	V	R	L	C	R	V	G	P	G	Y	E	S	C	P	A	N
SEQ ID NO: 104	V	R	M	C	Y	V	A	P	G	Y	V	S	C	P	R	M
SEQ ID NO: 105	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}								
SEQ ID NO: 106	X^3	C	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	C	X^{14}				
SEQ ID NO: 107	X^2	X^3	C	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	C	X^{14}	X^{15}		
SEQ ID NO: 108	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	X^{14}	X^{15}	X^{16}
SEQ ID NO: 109	N	W	E	C	I	F	S	P	G	R	R	G	C	S	L	T
SEQ ID NO: 110	D	W	E	C	L	F	L	P	G	R	R	G	C	L	L	F
SEQ ID NO: 111	E	W	E	C	L	F	M	P	G	R	R	G	C	L	L	M
SEQ ID NO: 112	A	W	E	C	L	F	L	P	G	H	R	G	C	S	L	F
SEQ ID NO: 113	E	W	E	C	L	F	L	P	G	R	K	G	C	T	L	F
SEQ ID NO: 114	D	W	E	C	I	F	L	P	G	R	R	G	C	T	L	F
SEQ ID NO: 115	V	Y	E	C	L	F	M	P	G	R	K	G	C	F	G	M
SEQ ID NO: 116	E	W	E	C	W	F	L	P	G	R	R	G	C	T	L	I
SEQ ID NO: 117	D	W	H	C	L	F	L	P	G	H	R	G	C	T	L	F
SEQ ID NO: 118	D	W	E	C	L	F	L	P	G	R	R	G	C	T	L	F
SEQ ID NO: 119	Y	W	E	C	V	F	M	P	G	H	R	G	C	S	L	I
SEQ ID NO: 120	T	W	D	C	L	F	L	P	G	R	R	G	C	T	L	M
SEQ ID NO: 121	N	W	E	C	I	F	S	P	G	R	R	G	C	S	L	T

SEQ ID NO: 122	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}								
SEQ ID NO: 123	X^3	C	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	C	X^{14}				
SEQ ID NO: 124	X^2	X^3	C	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	C	X^{14}	X^{15}		
SEQ ID NO: 125	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	X^{14}	X^{15}	X^{16}
SEQ ID NO: 126	A	G	W	C	K	L	N	P	G	T	Q	V	C	S	F	Y
SEQ ID NO: 127	E	T	P	C	D	L	H	P	G	H	W	S	C	S	M	V
SEQ ID NO: 128	F	F	L	C	D	D	F	P	G	L	P	R	C	E	W	I
SEQ ID NO: 129	G	L	R	C	Y	F	D	P	G	S	Q	I	C	T	F	L
SEQ ID NO: 130	G	Q	R	C	T	Y	D	P	G	Q	D	A	C	V	F	S
SEQ ID NO: 131	G	S	R	C	Y	W	D	P	G	R	E	V	C	I	F	K
SEQ ID NO: 132	K	L	W	C	Q	N	N	P	G	N	S	I	C	D	M	Y
SEQ ID NO: 133	K	S	W	C	F	D	H	P	G	Y	P	I	C	Q	F	Y
SEQ ID NO: 134	R	L	F	C	L	M	N	P	G	P	P	D	C	W	I	Y
SEQ ID NO: 135	R	Q	F	C	L	V	S	P	G	Y	E	D	C	W	F	V
SEQ ID NO: 136	T	R	M	C	F	D	D	P	G	W	H	S	C	P	V	V
SEQ ID NO: 137	T	R	W	C	S	L	H	P	G	V	G	E	C	V	T	L
SEQ ID NO: 138	T	T	V	C	D	Y	H	P	G	S	R	Y	C	I	N	E
SEQ ID NO: 139	Y	A	S	C	T	Y	L	P	G	H	R	G	C	T	L	V
SEQ ID NO: 140	W	L	P	C	D	D	Y	P	G	H	G	Y	C	Y	S	R
SEQ ID NO: 141	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}							
SEQ ID NO: 142	X^2	C	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	C	X^{14}			
SEQ ID NO: 143	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	X^{14}	X^{15}	X^{16}
SEQ ID NO: 144	S	A	C	Q	L	K	W	D	E	G	W	T	C	L	F	
SEQ ID NO: 145	N	H	C	T	L	S	K	T	Y	P	W	V	C	V	F	
SEQ ID NO: 146	Q	R	C	N	R	S	L	L	D	A	L	I	C	Q	A	
SEQ ID NO: 147	R	G	C	M	L	R	L	Q	P	E	L	A	C	V	F	
SEQ ID NO: 148	G	G	C	S	L	V	W	A	D	S	W	V	C	I	F	
SEQ ID NO: 149	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}							
SEQ ID NO: 150	X^2	C	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	C	X^{14}			
SEQ ID NO: 151	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	X^{14}	X^{15}	
SEQ ID NO: 152	S	R	C	S	L	V	W	T	D	T	W	V	C	V	F	

SEQ ID NO: 153	S	R	C	T	L	V	F	D	D	S	W	V	C	V	F
SEQ ID NO: 154	R	G	C	S	L	V	W	S	G	S	W	E	C	I	F
SEQ ID NO: 155	Q	A	C	Q	L	V	W	L	D	S	W	V	C	I	F
SEQ ID NO: 156	V	G	C	S	L	V	W	T	D	R	W	E	C	I	F
SEQ ID NO: 157	S	G	C	S	L	Q	W	A	D	G	W	V	C	I	F
SEQ ID NO: 158	A	R	C	S	L	V	W	D	E	A	W	V	C	I	F
SEQ ID NO: 159	R	G	C	S	L	V	W	A	G	S	W	E	C	I	F
SEQ ID NO: 160	S	R	C	S	L	V	W	A	E	N	W	V	C	I	F
SEQ ID NO: 161	R	R	C	T	L	V	F	L	D	S	W	E	C	I	F
SEQ ID NO: 162	R	G	C	T	L	A	W	E	D	S	W	V	C	I	F
SEQ ID NO: 163	R	G	C	S	L	R	F	A	E	A	W	E	C	I	F
SEQ ID NO: 164	A	S	C	S	L	V	W	Q	D	S	W	V	C	I	F
SEQ ID NO: 165	S	R	C	S	L	V	W	A	D	S	W	V	C	I	F
SEQ ID NO: 166	G	R	C	H	L	V	W	S	D	R	W	E	C	I	F
SEQ ID NO: 167	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}					
SEQ ID NO: 168	X^1	C	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	C	X^{14}	
SEQ ID NO: 169	G	C	T	L	K	W	E	S	P	N	W	T	C	Y	
SEQ ID NO: 170	S	C	T	V	R	W	D	G	D	W	W	V	C	E	
SEQ ID NO: 171	G	C	S	L	M	W	Q	D	G	W	W	V	C	I	
SEQ ID NO: 172	G	C	T	L	S	W	N	Q	G	W	W	H	C	V	
SEQ ID NO: 173	G	C	M	L	T	R	G	K	F	W	W	E	C	I	
SEQ ID NO: 174	G	C	V	L	Q	F	S	G	V	W	W	E	C	V	
SEQ ID NO: 175	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}					
SEQ ID NO: 176	X^2	C	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	C	X^{15}	
SEQ ID NO: 177	X^1	X^2	C	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	C	X^{15}	X^{16}
SEQ ID NO: 178	Q	R	C	Q	L	S	W	S	G	G	E	L	G	C	M	F
SEQ ID NO: 179	A	G	C	M	L	L	K	P	G	L	Y	W	E	C	I	F
SEQ ID NO: 180	A	R	C	S	L	H	H	T	G	S	R	Y	E	C	I	F
SEQ ID NO: 181	A	T	C	M	L	R	L	L	G	D	G	W	G	C	V	F
SEQ ID NO: 182	G	P	C	R	L	S	N	P	G	T	G	W	E	C	I	F
SEQ ID NO: 183	K	G	C	T	L	Q	N	P	G	S	G	W	V	C	L	F

SEQ ID NO: 184	L	A	C	I	L	S	K	P	G	E	H	W	E	C	L	F
SEQ ID NO: 185	N	G	C	T	L	S	F	S	G	M	S	W	T	C	V	Y
SEQ ID NO: 186	N	S	C	I	L	S	N	P	G	L	G	W	Q	C	V	F
SEQ ID NO: 187	N	T	C	K	L	F	R	S	G	N	I	W	Q	C	I	F
SEQ ID NO: 188	P	S	C	R	L	W	N	P	G	F	G	W	E	C	I	F
SEQ ID NO: 189	Q	S	C	T	L	Q	R	L	G	H	L	Y	Q	C	W	F
SEQ ID NO: 190	S	A	C	T	P	N	W	T	G	R	W	W	E	C	V	F
SEQ ID NO: 191	S	K	C	H	L	I	V	S	G	K	F	H	E	C	V	F
SEQ ID NO: 192	S	S	C	T	L	F	N	P	G	T	G	W	T	C	V	F
SEQ ID NO: 193	S	T	C	R	M	G	N	P	G	G	V	W	G	C	Y	F
SEQ ID NO: 194	T	H	C	L	V	Q	W	P	G	P	V	V	A	C	R	S
SEQ ID NO: 195	T	R	C	R	L	L	K	L	G	S	L	W	E	C	F	G
SEQ ID NO: 196	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}					
SEQ ID NO: 197	X^1	C	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	C	X^{15}	
SEQ ID NO: 198	A	C	W	R	S	W	R	Y	P	T	R	T	F	C	S	
SEQ ID NO: 199	K	C	R	L	R	Q	M	S	R	G	G	W	E	C	L	
SEQ ID NO: 200	N	C	R	V	R	H	L	P	Y	P	F	W	S	C	L	
SEQ ID NO: 201	R	C	R	L	Q	K	A	G	G	N	T	W	E	C	I	
SEQ ID NO: 202	R	C	T	L	R	F	D	A	Q	T	G	W	E	C	N	
SEQ ID NO: 203	T	C	R	L	K	R	S	G	P	N	S	W	E	C	I	
SEQ ID NO: 204	T	C	T	V	H	R	I	G	L	A	E	W	E	C	V	
SEQ ID NO: 205	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}						
SEQ ID NO: 206	X^2	C	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	C	X^{15}		
SEQ ID NO: 207	X^1	X^2	C	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	C	X^{15}	X^{16}
SEQ ID NO: 208	V	K	C	K	L	V	N	P	G	S	G	W	A	C	H	F
SEQ ID NO: 209	V	R	C	F	M	S	E	P	G	R	V	S	Y	C	T	A
SEQ ID NO: 210	V	R	C	R	L	A	R	P	G	L	T	W	E	C	L	S
SEQ ID NO: 211	V	R	C	R	V	L	Y	P	G	Q	M	A	V	C	V	S
SEQ ID NO: 212	V	T	C	Y	R	A	V	P	G	V	E	A	Y	C	F	S
SEQ ID NO: 213	V	Y	C	R	R	E	K	P	G	G	E	M	H	C	R	S
SEQ ID NO: 214	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}						

SEQ ID NO: 215	X^2	C	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	C	X^{15}	
SEQ ID NO: 216	X^1	X^2	C	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	C	X^{15}	X^{16}
SEQ ID NO: 217	A	T	C	H	L	L	A	P	G	V	D	N	T	C	I	F
SEQ ID NO: 218	H	G	C	T	L	T	K	P	G	A	E	W	V	C	S	F
SEQ ID NO: 219	Q	L	C	P	W	S	D	P	G	S	W	G	P	C	P	L
SEQ ID NO: 220	R	D	C	A	G	M	E	P	G	T	S	V	F	C	D	N
SEQ ID NO: 221	R	D	C	F	I	L	E	P	G	T	S	V	Y	C	D	L
SEQ ID NO: 222	T	D	C	Q	E	T	W	P	G	D	R	P	W	C	H	I
SEQ ID NO: 223	V	K	C	F	M	S	T	P	G	Q	I	A	Y	C	T	T
SEQ ID NO: 224	V	K	C	Y	R	N	S	P	G	V	E	A	Y	C	V	G
SEQ ID NO: 225	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}						
SEQ ID NO: 226	X^1	C	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	C	X^{14}		
SEQ ID NO: 227	D	C	L	D	L	R	G	T	V	G	M	V	C	Q		
SEQ ID NO: 228	P	C	Q	R	L	A	E	Y	Y	S	Q	Q	C	L		
SEQ ID NO: 229	S	C	M	D	L	K	G	S	V	G	W	V	C	D		
SEQ ID NO: 230	T	C	E	S	L	A	K	M	Y	E	V	E	C	N		
SEQ ID NO: 231	T	C	E	S	L	A	R	M	Y	N	E	N	C	I		
SEQ ID NO: 232	W	C	W	E	P	H	D	Q	Y	Y	V	R	C	P		
SEQ ID NO: 233	Y	C	H	D	F	K	G	T	V	G	T	L	C	I		
SEQ ID NO: 234	G	C	Q	L	V	W	Q	D	D	S	Y	M	C	F	Y	
SEQ ID NO: 235	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}						
SEQ ID NO: 236	X^1	C	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	C	X^{14}		
SEQ ID NO: 237	W	C	I	G	Q	P	L	F	R	Q	G	S	C	K		
SEQ ID NO: 238	W	C	V	G	Q	P	L	Y	R	L	G	S	C	K		
SEQ ID NO: 239	W	D	Q	F	Q	L	G	W	E	A	G	V	A	A		
SEQ ID NO: 240	F	L	P	W	P	V	Y	F	S	Q	V	L	G	G	G	
SEQ ID NO: 241	Y	V	M	C	S	A	F	G	C	K	S	I				
SEQ ID NO: 242	H	V	I	C	S	V	N	G	G	C	R	G				
SEQ ID NO: 243	I	R	F	C	L	R	S	E	P	T	A	C	W	I	V	
SEQ ID NO: 244	I	R	C	R	Y	E	K	Q	S	G	I	C	L	F		
SEQ ID NO: 245	G	G	C	S	L	V	W	A	D	S	W	V	C	I	F	

SEQ ID NO: 246	G	C	S	L	M	W	Q	D	G	W	W	V	C	I				
SEQ ID NO: 247	E	W	E	C	R	F	L	P	G	R	R	G	C	S	L	F		
SEQ ID NO: 248	K	G	C	T	L	Q	N	P	G	S	G	W	V	C	L	F		
SEQ ID NO: 249	T	C	R	L	K	R	S	G	P	N	S	W	E	C	I			
SEQ ID NO: 250	W	C	I	G	Q	P	L	F	R	Q	G	S	C	K				
SEQ ID NO: 251	A	V	S	C	N	S	W	R	C	I	P	W						
SEQ ID NO: 252	A	V	C	C	D	G	N	S	C	R	R	C						
SEQ ID NO: 253	F	V	H	C	S	L	M	G	C	W	C	G						
SEQ ID NO: 254	R	C	L	D	L	G	G	S	V	G	L	V	C	F				
SEQ ID NO: 255	V	C	F	N	F	R	G	T	V	G	R	H	C	W				
SEQ ID NO: 256	V	R	C	R	Q	N	E	P	G	G	A	Y	W	C	S	S		
SEQ ID NO: 257	C	V	L	R	E	G	A	E	G	W	E	C	V	W	R			
SEQ ID NO: 258	C	R	M	M	Q	G	T	Y	G	W	T	C	L	F				
SEQ ID NO: 259	C	I	L	N	D	T	I	Q	G	W	V	C	I	Y				
SEQ ID NO: 260	C	T	L	Y	R	S	A	P	G	V	W	L	C	I	F			
SEQ ID NO: 261	C	L	V	F	D	Q	Y	G	N	Y	K	R	R	C				
SEQ ID NO: 262	I	V	C	C	N	M	F	G	C	H	T	C	R	N				
SEQ ID NO: 263	Q	V	C	C	T	S	R	G	C	R	V	C	A	P	V			
SEQ ID NO: 264	R	V	C	C	S	M	V	G	C	R	S	C	N	L				
SEQ ID NO: 265	R	V	C	C	T	F	A	G	C	R	V	C	H	K				
SEQ ID NO: 266	R	V	C	C	T	S	D	G	C	R	G	C	R	Q				
SEQ ID NO: 267	T	V	C	C	T	V	Q	G	C	W	P	C	S	R				
SEQ ID NO: 268	V	C	C	H	Q	T	F	G	C	Y	R	C	K	Q				
SEQ ID NO: 269	C	V	V	C	S	A	L	G	C	R	A	C	V	P	R			
SEQ ID NO: 270	V	W	D	C	F	V	R	G	W	E	A	G	V	A	A	V	G	E
SEQ ID NO: 271	L	T	C	L	I	F	K	P	G	T	H	R	H	C	P	V		
SEQ ID NO: 272	R	Y	C	S	P	L	I	P	G	S	A	L	G	C	P	R		
SEQ ID NO: 273	I	R	C	R	L	D	P	P	G	S	Y	K	T	C	V	F		
SEQ ID NO: 274	R	G	V	I	C	N	H	A	G	C	R	I	W	Y	G			
SEQ ID NO: 275	T	T	Q	S	C	T	L	R	Y	C	W	L	L	Q				
SEQ ID NO: 276	W	W	I	S	C	L	R	D	L	R	C	L	E	Y	F			

SEQ ID NO: 277	R	H	A	C	K	T	W	Y	R	M	C	I	V	S		
SEQ ID NO: 278	A	V	S	C	S	R	L	T	G	R	C	H	S	L		
SEQ ID NO: 279	W	V	A	C	N	R	V	T	G	S	C	R	P	I		
SEQ ID NO: 280	S	H	G	V	C	C	T	Q	S	S	C	R	S	C	R	
SEQ ID NO: 281	W	V	A	C	N	R	L	S	G	C	C	R	P	I		
SEQ ID NO: 282	H	T	V	C	C	Q	D	W	G	C	R	S	C	S	G	
SEQ ID NO: 283	M	A	C	C	T	P	R	G	C	R	P	C				
SEQ ID NO: 284	R	S	V	C	C	S	S	Y	G	C	R	A	C	F	G	
SEQ ID NO: 285	C	K	L	T	C	T	S	S	T	C	S	C	V	F		
SEQ ID NO: 286	C	M	L	K	C	T	N	A	I	C	E	C	I	F		
SEQ ID NO: 287	C	R	V	W	C	N	Q	A	E	C	M	C	I	F		
SEQ ID NO: 288	S	R	C	S	F	D	V	T	K	Q	E	C	V	F		
SEQ ID NO: 289	L	E	C	Q	P	Y	R	G	P	L	Y	Y	C	Q	D	
SEQ ID NO: 290	S	I	C	C	T	P	Q	L	C	H	S	C	D	G		
SEQ ID NO: 291	T	T	C	C	T	S	E	G	C	H	K	C	I	T	L	
SEQ ID NO: 292	C	V	A	C	S	S	D	G	C	S	P	I	I	C		
SEQ ID NO: 293	A	I	C	S	E	D	E	G	G	E	L	C	C	W	H	
SEQ ID NO: 294	H	E	I	C	C	G	P	P	G	C	H	S	C	S	V	T
SEQ ID NO: 295	L	S	V	C	S	C	P	P	G	Q	L	Y	C	M	V	E
SEQ ID NO: 296	S	T	W	C	C	L	H	P	G	V	G	E	C	Q	A	V
SEQ ID NO: 297	V	T	Q	C	F	D	G	P	G	S	F	R	C	C	Y	Q
SEQ ID NO: 298	R	Q	C	N	C	L	S	P	G	E	L	V	N	C	Q	Q
SEQ ID NO: 299	M	V	S	C	T	D	L	G	C	V	V	V	G	G	G	
SEQ ID NO: 300	V	V	H	C	L	Q	S	G	C	Y	S	V	G	S	G	
SEQ ID NO: 301	T	I	K	C	G	S	S	G	W	C	W	V	E	A	G	
SEQ ID NO: 302	M	V	S	C	T	D	L	G	C	V	V	V	G	G	G	
SEQ ID NO: 303	H	E	I	C	C	G	P	P	G	C	H	S	C	S	V	T
SEQ ID NO: 304	L	S	V	C	S	C	P	P	G	Q	L	Y	C	M	V	E
SEQ ID NO: 305	S	T	W	C	C	L	H	P	G	V	G	E	C	Q	A	V
SEQ ID NO: 306	V	T	Q	C	F	D	G	P	G	S	F	R	C	C	Y	Q
SEQ ID NO: 307	R	Q	C	N	C	L	S	P	G	E	L	V	N	C	Q	Q

SEQ ID NO: 308	F	V	R	C	S	A	N	G	C	V						
SEQ ID NO: 309	S	V	R	C	S	A	S	G	C	V						
SEQ ID NO: 310	Y	V	A	C	S	V	S	G	C	V						
SEQ ID NO: 311	Y	V	I	C	G	A	S	G	C	V						
SEQ ID NO: 312	Y	V	R	C	T	A	I	G	C	V						
SEQ ID NO: 313	F	V	R	C	S	A	T	G	C	V						
SEQ ID NO: 314	Y	V	I	C	S	A	S	G	C	V						
SEQ ID NO: 315	W	V	R	C	S	A	S	G	C	V						
SEQ ID NO: 316	F	V	R	C	S	A	S	G	C	V						
SEQ ID NO: 317	F	V	R	C	T	A	S	G	C	V						
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SEQ ID NO: 322	L	R	R	C	S	A	N	G	C	V						
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SEQ ID NO: 325	F	V	R	C	T	R	E	G	C	V						
SEQ ID NO: 326	F	V	R	C	T	S	D	G	C	V						
SEQ ID NO: 327	Y	V	I	C	S	A	S	G	C	V						
SEQ ID NO: 328	F	V	R	C	T	E	W	G	C	V						
SEQ ID NO: 329	F	V	R	C	T	A	S	G	C	I						
SEQ ID NO: 330	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	N	A
SEQ ID NO: 331	F	V	R	C	S	E	S	G	C	V	G	S	S	W	S	A
SEQ ID NO: 332	Y	V	R	C	S	A	S	G	C	V	G	S	S	W	F	L
SEQ ID NO: 333	Y	V	R	C	S	D	S	G	C	V	G	S	T	W	G	W
SEQ ID NO: 334	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	V	F
SEQ ID NO: 335	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	V	F
SEQ ID NO: 336	Y	V	L	C	A	L	S	G	C	V	G	S	S	W	S	S
SEQ ID NO: 337	Y	V	R	C	G	E	S	G	C	V	G	S	T	W	S	T
SEQ ID NO: 338	Y	V	R	C	S	A	T	G	C	V	G	S	T	W	T	F

SEQ ID NO: 339	Y	V	R	C	G	E	T	G	C	V	G	S	T	W	S	F
SEQ ID NO: 340	Y	V	R	C	G	V	S	G	C	V	G	S	S	W	V	L
SEQ ID NO: 341	Y	V	R	C	G	E	S	G	C	V	G	S	T	W	S	T
SEQ ID NO: 342	F	V	R	C	S	E	S	G	C	V	G	S	S	W	S	T
SEQ ID NO: 343	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	W	A
SEQ ID NO: 344	Y	V	R	C	S	V	T	G	C	V	G	S	S	W	S	I
SEQ ID NO: 345	Y	V	R	C	S	V	T	G	C	V	G	S	S	W	S	I
SEQ ID NO: 346	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	S	V
SEQ ID NO: 347	F	V	R	C	S	A	D	G	C	V	G	S	S	W	L	Q
SEQ ID NO: 348	Y	V	R	C	S	A	D	G	C	V	G	S	S	W	I	T
SEQ ID NO: 349	Y	V	R	C	N	P	S	G	C	V	G	S	S	W	S	I
SEQ ID NO: 350	Y	V	R	C	S	V	T	G	C	V	G	S	S	W	S	I
SEQ ID NO: 351	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	S	V
SEQ ID NO: 352	F	V	R	C	S	A	N	G	C	V	G	S	T	W	Q	A
SEQ ID NO: 353	Y	V	R	C	T	E	S	G	C	V	G	S	T	W	T	Y
SEQ ID NO: 354	Y	V	R	C	S	V	T	G	C	V	G	S	T	W	S	V
SEQ ID NO: 355	Y	V	R	C	S	E	I	G	C	V	G	S	T	W	S	L
SEQ ID NO: 356	T	V	R	C	S	A	T	G	C	V	G	S	S	W	V	G
SEQ ID NO: 357	Y	V	R	C	S	A	T	G	C	V	G	S	S	W	V	G
SEQ ID NO: 358	F	V	R	C	S	A	S	G	C	V	G	S	S	W	V	G
SEQ ID NO: 359	Y	V	R	C	S	A	D	G	C	V	G	S	T	W	N	L
SEQ ID NO: 360	Y	V	R	S	S	Q	S	G	C	V	G	S	G	W	V	L
SEQ ID NO: 361	Y	V	A	C	S	E	S	G	C	V	G	S	S	W	S	V
SEQ ID NO: 362	F	V	A	C	G	E	L	G	C	V	G	S	S	W	S	I
SEQ ID NO: 363	Y	V	A	C	S	E	S	G	C	V	G	S	S	W	L	A
SEQ ID NO: 364	Y	C	R	C	T	E	S	G	C	V	G	S	T	W	T	Y
SEQ ID NO: 365	F	V	R	C	T	A	I	G	C	V	G	S	S	W	S	V
SEQ ID NO: 366	Y	V	R	C	S	A	D	G	C	V	G	S	S	W	S	A
SEQ ID NO: 367	Y	V	R	C	S	A	S	G	C	V	G	S	S	W	N	Y
SEQ ID NO: 368	Y	V	L	C	S	A	S	G	C	V	G	S	L	W	T	H
SEQ ID NO: 369	Y	V	R	C	T	D	S	G	C	V	G	S	S	W	H	L

SEQ ID NO: 370	Y	V	A	C	S	E	S	G	C	V	G	S	T	W	I	T			
SEQ ID NO: 371	Y	V	A	C	S	E	S	G	C	V	G	S	T	W	T	F			
SEQ ID NO: 372	Y	V	R	C	G	A	A	G	C	V	V	S	S	W	V	Y			
SEQ ID NO: 373	F	V	R	C	G	A	S	G	C	V	G	S	T	W	G	S			
SEQ ID NO: 374	Y	V	A	C	S	E	I	G	C	V	G	S	T	W	S	L			
SEQ ID NO: 375	Y	V	A	C	S	E	S	G	C	V	G	S	S	W	T	W			
SEQ ID NO: 376	Y	V	A	C	S	V	S	G	C	V	G	S	S	W	S	V			
SEQ ID NO: 377	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	T	T			
SEQ ID NO: 378	Y	V	R	C	S	E	S	G	C	V	S	S	F	W	S	A	P	W	K
SEQ ID NO: 379	Y	V	R	C	S	E	N	G	C	V	G	H	S	W	T	Q	G	L	R
SEQ ID NO: 380	Y	V	R	C	S	E	S	G	C	V	S	Q	R	P	H	V	L	E	V
SEQ ID NO: 381	Y	V	L	C	S	E	R	G	C	V	G	Q	N	W	A	V	G	K	L
SEQ ID NO: 382	Y	V	R	C	S	E	I	G	C	V	G	S	H	W	S	S	Y	G	K
SEQ ID NO: 383	Y	V	R	C	S	E	N	G	C	V	G	S	S	W	G	R	V	T	L
SEQ ID NO: 384	Y	V	R	C	S	E	S	G	C	V	G	C	E	L	V	W	Y	F	I
SEQ ID NO: 385	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	G	A	V	A	S
SEQ ID NO: 386	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	G	A	V	A	S
SEQ ID NO: 387	Y	V	R	C	S	E	S	G	C	V	G	S	S	W	S	V	S	P	R
SEQ ID NO: 388	Y	V	R	C	G	E	S	G	C	V	S	S	S	W	S	T	M	G	N
SEQ ID NO: 389	Y	V	R	C	S	E	N	G	C	V	G	S	S	W	E	H	S	A	I
SEQ ID NO: 390	Y	V	R	C	S	E	G	G	C	V	G	S	T	W	T	A	S	Y	P
SEQ ID NO: 391	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	N	G	V	L	S
SEQ ID NO: 392	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	N	G	V	L	S
SEQ ID NO: 393	T	V	R	C	S	Q	S	G	C	V	G	C	Q	L	V	W	Y	F	T
SEQ ID NO: 394	Y	V	N	C	S	Q	S	G	C	V	G	S	T	W	N	G	V	F	S
SEQ ID NO: 395	Y	V	A	C	S	E	S	G	C	V	S	V	D	S	S	A	G	A	L
SEQ ID NO: 396	Y	V	R	C	N	E	T	G	C	V	G	S	S	W	I	A	A	G	P
SEQ ID NO: 397	Y	V	R	C	S	E	S	G	C	V	G	S	T	W	L	F	N	P	W
SEQ ID NO: 400	W	D	D	F	I	L	G	W	E	A	G	V	A	A	V	G	E	V	
SEQ ID NO: 401	F	L	P	W	P	V	Y	F	S	Q	V	L	G	G	R	R			
SEQ ID NO: 402	Y	V	M	C	S	A	F	G	C	K	S	I	G	G					

SEQ ID NO: 403	H	V	I	C	S	V	N	G	G	C	R	G	G	G					
SEQ ID NO: 404	G	G	I	R	F	C	L	R	S	E	P	T	A	C	W	I	V	G	G
SEQ ID NO: 405	G	G	I	R	C	R	Y	E	K	Q	S	G	I	C	L	F	G	G	
SEQ ID NO: 406	G	G	G	G	C	S	L	V	W	A	D	S	W	V	C	I	F	G	G
SEQ ID NO: 407	G	G	G	C	S	L	M	W	Q	D	G	W	W	V	C	I	G	G	
SEQ ID NO: 408	G	G	E	W	E	C	R	F	L	P	G	R	R	G	C	S	L	F	G
SEQ ID NO: 409	G	G	K	G	C	T	L	Q	N	P	G	S	G	W	V	C	L	F	G
SEQ ID NO: 410	G	G	T	C	R	L	K	R	S	G	P	N	S	W	E	C	I	G	G
SEQ ID NO: 411	G	G	W	C	I	G	Q	P	L	F	R	Q	G	S	C	K	G	G	
SEQ ID NO: 412	F	V	L	C	G	L	Q	G	C	R	S	G	G						
SEQ ID NO: 413	F	V	P	W	D	E	Y	F	L	Q	I	L	G	G					
SEQ ID NO: 414	G	G	G	W	V	I	C	S	A	L	G	C	P	F	G	G			
SEQ ID NO: 415	G	G	G	R	R	F	C	L	R	S	E	P	T	A	C	W	T	V	G
SEQ ID NO: 416	G	G	G	S	R	C	S	L	V	W	A	D	S	W	V	C	I	F	G
SEQ ID NO: 417	G	G	D	W	E	C	L	F	L	P	G	R	R	G	C	T	L	F	G
SEQ ID NO: 418	F	I	P	W	D	E	Y	F	A	Q	L	L	G	G					
SEQ ID NO: 419	F	V	P	W	D	V	Y	F	S	Q	I	L	G	G					
SEQ ID NO: 420	F	I	P	W	D	E	Y	F	K	Q	V	L	G	G					
SEQ ID NO: 421	F	V	P	W	P	E	Y	F	L	Q	I	M	G	G					
SEQ ID NO: 422	F	I	P	W	E	E	Y	F	S	Q	L	L	G	G					
SEQ ID NO: 1000	M	G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V
SEQ ID NO: 1001	G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V	D
SEQ ID NO: 1002	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V	D	
SEQ ID NO: 1003	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V	D		
SEQ ID NO: 1004	M	G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V
SEQ ID NO: 1005	M	G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	
SEQ ID NO: 1006	M	G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L		
SEQ ID NO: 1007	G	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L	S	V	
SEQ ID NO: 1008	F	Y	P	C	W	T	A	Q	L	G	E	L	C	D	L				
SEQ ID NO: 1010	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L					
SEQ ID NO: 1011	G	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L				

SEQ ID NO: 1012	G	G	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L			
SEQ ID NO: 1013	G	G	G	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L		
SEQ ID NO: 1014	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	G				
SEQ ID NO: 1015	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	G	G			
SEQ ID NO: 1016	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	G	G	G		
SEQ ID NO: 1017	G	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	G			
SEQ ID NO: 1018	G	G	K	Y	C	G	F	A	Q	L	G	E	L	C	V	L	G		
SEQ ID NO: 1020	Y	W	C	W	M	A	Q	V	G	E	L	C	D	L					
SEQ ID NO: 1021	Y	H	C	W	M	A	Q	V	G	E	L	C	D	L					
SEQ ID NO: 1022	Y	H	C	W	M	G	Q	V	G	E	L	C	D	L					
SEQ ID NO: 1023	Y	H	C	W	M	G	Q	M	G	E	L	C	D	L					
SEQ ID NO: 1024	Y	H	C	W	M	G	Q	M	G	E	L	C	E	L					
SEQ ID NO: 1025	Y	H	C	W	M	G	Q	M	G	E	L	C	E	M					
SEQ ID NO: 1030	Y	P	C	W	L	A	R	V	G	E	L	C	D	L	D	S	G	D	V
SEQ ID NO: 1031	A	P	C	W	L	A	R	V	G	E	L	C	D	L	D	S	G	D	V
SEQ ID NO: 1032	A	P	C	A	L	A	R	V	G	E	L	C	D	L	D	S	G	D	V
SEQ ID NO: 1033	A	P	C	A	L	A	A	V	G	E	L	C	D	L	D	S	G	D	V
SEQ ID NO: 1034	A	P	C	A	L	A	A	V	G	A	L	C	D	L	D	S	G	D	V
SEQ ID NO: 1035	A	P	C	A	L	A	A	V	G	A	L	C	D	L	A	S	G	D	V
SEQ ID NO: 1036	A	P	C	A	L	A	A	V	G	A	L	C	D	L	A	A	G	D	V

CLAIMS

What is claimed is:

1. An IL-2Rα ligand, wherein,

the IL-2Rα ligand bind to the human IL-2Rα subunit with an IC_{50} of less than 100 μM; and

the IL-2Rα ligand comprises an amino acid sequence selected from any one of SEQ ID NOS: 4, 9, 24, 31, 44, 50, 67, 79, 100, 112, 135, 144, 154, 172, 180, 203, 210, 219, 234, 250, and 418:

SEQ ID NO: 4	F	L	H	W	P	V	Y	F	C	Q	V	M			
SEQ ID NO: 9	F	I	P	W	D	E	Y	F	K	Q	V	L			
SEQ ID NO: 24	F	V	H	C	T	L	L	G	C	W	S	G			
SEQ ID NO: 31	W	V	I	C	S	A	V	G	C	R	P	F			
SEQ ID NO: 44	H	V	I	C	S	V	N	G	G	C	R	G			
SEQ ID NO: 50	E	Q	F	C	L	V	S	D	P	M	A	C	W	S	L
SEQ ID NO: 67	R	R	F	C	L	R	S	E	P	A	A	C	W	F	V
SEQ ID NO: 79	S	K	C	V	Y	D	Y	N	F	G	T	C	I	F	
SEQ ID NO: 100	S	L	N	C	K	T	R	P	G	L	R	W	C	T	W	T
SEQ ID NO: 112	A	W	E	C	L	F	L	P	G	H	R	G	C	S	L	F
SEQ ID NO: 135	R	Q	F	C	L	V	S	P	G	Y	E	D	C	W	F	V
SEQ ID NO: 144	S	A	C	Q	L	K	W	D	E	G	W	T	C	L	F	
SEQ ID NO: 154	R	G	C	S	L	V	W	S	G	S	W	E	C	I	F	
SEQ ID NO: 172	G	C	T	L	S	W	N	Q	G	W	W	H	C	V		
SEQ ID NO: 180	A	R	C	S	L	H	H	T	G	S	R	Y	E	C	I	F
SEQ ID NO: 203	T	C	R	L	K	R	S	G	P	N	S	W	E	C	I	
SEQ ID NO: 210	V	R	C	R	L	A	R	P	G	L	T	W	E	C	L	S
SEQ ID NO: 219	Q	L	C	P	W	S	D	P	G	S	W	G	P	C	P	L
SEQ ID NO: 234	G	C	Q	L	V	W	Q	D	D	S	Y	M	C	F	Y	
SEQ ID NO: 250	W	C	I	G	Q	P	L	F	R	Q	G	S	C	K		
SEQ ID NO: 418	F	V	P	W	D	V	Y	F	S	Q	I	L	G	G		

2. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 4.

3. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 9.

4. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 24.

5. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 31.

6. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 44.

7. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 50.

8. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 67.

9. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 79.

10. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 100.

11. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 112.

12. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 135.

13. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 144.

14. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 154.

15. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 172.

16. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 180.

17. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 203.

18. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 210.

19. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 219.

20. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID NO: 234.

21. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID. NO: 250.

22. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises the amino acid sequence of SEQ ID. NO: 418.

23. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand has a greater than 70% sequence similarity to any one of SEQ ID NOS: 4, 9, 24, 31, 44, 50, 67, 79, 100, 112, 135, 144, 154, 172, 180, 203, 210, 219, 234, 250, and 418.

24. The IL-2Rα ligand of claim 1, wherein the IL-2Rα ligand comprises a truncated IL-2Rα ligand of any one of SEQ ID NOS: 4, 9, 24, 31, 44, 50, 67, 79, 100, 112, 135, 144, 154, 172, 180, 203, 210, 219, 234, 250, and 418, in which from 1 to 3 amino acids is removed from the N-terminus, the C-terminus, or from both the N-terminus and the C-terminus.

25. A compound comprising at least one IL-2Rα ligand of claim 1.

26. The compound of claim 25, wherein the compound is selected from a peptide, a conjugate, and a fusion protein.

27. A pharmaceutical composition comprising the IL-2Rα ligand of claim 1.

28. A pharmaceutical composition comprising the compound of claim 26.