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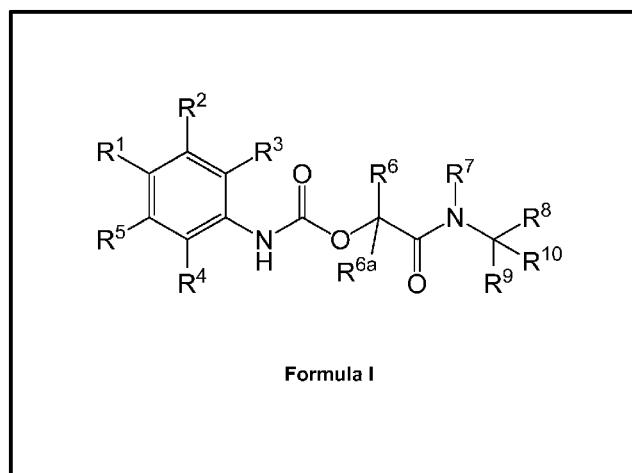


FIG. 1

(57) Abstract: The present invention relates to N-phenyl carbamate derivatives, processes for preparing them, pharmaceutical compositions containing them and their use as pharmaceuticals as modulators of the N-formyl peptide 2 receptor.

PHENYLCARBAMATE DERIVATIVES AS FORMYL PEPTIDE RECEPTOR MODULATORS

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CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Patent Application No. 61/907,320, filed November 21, 2013, the entire contents of which is incorporated herein by this specific reference.

10 FIELD OF THE INVENTION

The present invention relates to N-phenyl carbamate derivatives, processes for preparing them, pharmaceutical compositions containing them and their use as pharmaceuticals as modulators of the N-formyl peptide 2 receptor (FPR2). The invention relates specifically to the use of these compounds and their pharmaceutical
15 compositions to treat disorders associated with the FPR2 modulation.

BACKGROUND OF THE INVENTION

The formyl peptide receptor (FPR) family belongs to the seven transmembrane domain G-protein-coupled receptor (GPCR) family. This family includes 3 members in humans, and one member of this family, FPR2 (also known
20 as FPRL-1, ALXA4), is expressed predominantly on inflammatory cells such as monocytes and neutrophils, as well as on T cells, and has been shown to play a critical role in leukocyte trafficking during inflammation and human pathology (Chiang N, Serhan CN, Dahlen, S, Drazen JM, Hay DWP, Rovati E, Shimizu T, Yokomizo T, Brink, C. The lipoxin receptor ALX: Potent ligand-specific and stereoselective actions
25 in vivo. Pharmacological Reviews 2006; 58: 463-519). FPR2 is an exceptionally promiscuous receptor that responds to a menagerie of structurally diverse exogenous and endogenous ligands, including serum amyloid A (SAA), chemokine variant sCK β 8-1, the neuroprotective peptide humanin, anti-inflammatory eicosanoid lipoxin A4 (LXA4) and glucocorticoid-modulated protein annexin A1 (Chiang N,
30 Serhan CN, Dahlen, S, Drazen JM, Hay DWP, Rovati E, Shimizu T, Yokomizo T, Brink, C. The lipoxin receptor ALX: Potent ligand-specific and stereoselective actions in vivo. Pharmacological Reviews 2006; 58: 463-519). FPR2 has been shown to

transduce anti-inflammatory effects of arachidonic acid derived Lipoxin A4 (LXA4) in many systems, and has been shown to play a key role in the resolution of inflammation (Dufton N, Perretti M. Therapeutic anti-inflammatory potential of formyl peptide receptor agonists. *Pharmacology & Therapeutics* 2010; 127: 175-188).

5 FPR2 knockout mice show exaggerated inflammation in disease conditions as expected by the biological role of the receptor (Dufton N, Hannon R, Brancialeone V, Dalli J, Patel HB, Gray M, D'Aquisto F, Buckingham JC, Perretti M, Flower RJ. Anti-inflammatory role of the murine formyl-peptide receptor 2: Ligand-specific effects on leukocyte responses and experimental inflammation. *Journal of Immunology* 2010; 10 184: 2611-2619. Gavins FNE, Hughes EL, Buss NAPS, Holloway PM, Getting SJ, Buckingham JC. Leukocyte recruitment in the brain in sepsis: involvement of the annexin1 FPR2/ALX anti-inflammatory system. *FASEB* 2012; 26: 1-13).

Activation of FPR2 by lipoxin A4 or its analogs and by Annexin I protein has been shown to result in anti-inflammatory activity by promoting active resolution of inflammation which involves inhibition of polymorphonuclear neutrophils (PMNs) and eosinophils migration and also stimulating monocyte migration enabling clearance of apoptotic cells from the site of inflammation in a nonphlogistic manner (Gavins FNE, Hughes EL, Buss NAPS, Holloway PM, Getting SJ, Buckingham JC. Leukocyte recruitment in the brain in sepsis: involvement of the annexin1 FPR2/ALX anti-inflammatory system. *FASEB* 2012; 26: 1-13, Maderna P, Cottell DC, Toivonen T, Dufton N, Dalli J, Perretti M, Godson C. FPR2/ALX receptor expression and internalization are critical for lipoxin A4 and annexin-derived peptide-stimulated phagocytosis. *FASEB* 2010; 24: 4240-4249). In addition, FPR2 has been shown to inhibit natural killer (NK) cytotoxicity and promote activation of T cells which further

25 contributes to down regulation of tissue damaging inflammatory signals.

FPR2 interaction with LXA4 and Annexin has been shown to be beneficial in experimental models of dermal inflammation, angiogenesis, epithelial migration, edema, alopecia, ischemia reperfusion and ocular inflammation, such as endotoxin-induced uveitis and corneal wound healing. (Reville K, Cream JK, Vivers S, Dransfield I, Godson C. Lipoxin A4 redistributes Myosin IIA and Cdc42 in macrophages: Implications for phagocytosis of apoptotic leukocytes. *Journal of Immunology* 2006; 176: 1878-1888; Serhan C. Resolution phase of inflammation:

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Novel endogenous anti-inflammatory and proresolving lipid mediators and pathways. Annual reviews of Immunology 2007; 25: 101-137.; Medeiros R, Rodrigues GB, Figueiredo CP, Rodrigues EB, Grumman A Jr, Menezes-de-Lima O Jr, Passos GF, Calixto JB. Molecular mechanisms of topical anti-inflammatory effects of lipoxin A(4) in endotoxin-induced uveitis. *Molecular Pharmacology* 2008; 74: 154-161; Gronert K, Maheshwari N, Khan N, Hassan IR, Dunn M, Schwartzmann ML. A role for the mouse 12/15-lipoxygenase pathways in promoting epithelial wound healing and host defense. *Journal of Biological Chemistry* 2005; 280: 15267-15278; Gronert K. Lipoxins in the eye and their role in wound healing. *Prostaglandins, Leukotrienes and Essential fatty Acids*. 2005; 73: 221-229); Takano T, Fiore S, Maddox JF, Brady HR, Petasis NA, Serhan CN. Aspirin-triggered 15-epi-lipoxin A4 and LXA4 stable analogues are potent inhibitors of acute inflammation: evidence for anti-inflammatory receptors. *Journal of Experimental Medicine* 1997; 185: 1693-1704.; Leoni G, Alam A, Neumann PA, Lambeth JD, Cheng G, McCoy J, Hilgarth RS, Kundu K, Murthy N, Kusters D, Reutelingsperger C, Perretti M, Parkos CA, Neish AS, Nusrat A. Annexin A1, formyl peptide receptor, and NOX1 orchestrate epithelial repair. *Journal of Clinical Investigation*. 2013;123:443-54; Leedom A, Sullivan AB, Dong B, Lau D, Gronert K. Endogenous LXA4 circuits are determinants of pathological angiogenesis in response to chronic injury. *American Journal of Pathology* 2010; 176: 74-84; Tsuruki T, Takahata K, Yoshikawa M. Mechanism of the protective effect of intraperitoneally administered agonists for formyl peptide receptors against chemotherapy-induced alopecia. *Biosci Biotechnology Biochemistry*. 2007;71:1198-202).

Pharmaceutical utility of lipoxin A4 and its analogs are hampered by inherent physicochemical properties of the natural poly-olefinic natural product. Therefore, small molecule anti-inflammatory agonists of FPR2 would have a wide variety of therapeutic benefit in inflammatory disorders, including inflammatory disorders in the eye. Targeting FPR2 selectively would also have benefits of reduced side effects as compared to more broad acting anti-inflammatories such as steroids or NSAIDs which have significant side effects of elevated IOP and delays in wound healing in the eye. FPR2 is also expressed in ocular tissues in the cornea and also the posterior of eye, in addition to the inflammatory cells that migrate into the ocular tissues.

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Targeting FPR2 selectively would also have benefits in skin wound healing given its potent anti-inflammatory and pro-epithelial repair role. In addition, some skin diseases have been shown to have an abnormal expression of LL37, a pro-inflammatory cathelicidin which has been shown to be a natural ligand of FPR2. In the chronic inflammatory disease rosacea, LL37 is highly expressed and is believed to play a key role in the pathogenesis (Yamasaki K, Di Nardo A, Bardan A, Murakami M, Ohtake T, Coda A, Dorschner RA, Bonnart C, Descargues P, Hovnanian A, Morhenn VB, Gallo RL. Increased serine protease activity and cathelicidin promotes skin inflammation in rosacea. Nature Medicine. 2007;13:975-80).

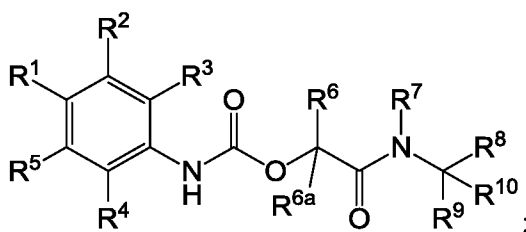
FPR2 thus represents an important novel pro-resolutionary molecular target for the development of new therapeutic agents in diseases or conditions with excessive inflammatory responses.

SUMMARY OF THE INVENTION

A group of N-phenyl carbamate derivatives, which are potent and selective FPR2 modulators, has been discovered. As such, the compounds described herein are useful in treating a wide variety of disorders associated with modulation of FPR2 receptor. The term "modulator" as used herein, includes but is not limited to: receptor agonist, antagonist, inverse agonist, inverse antagonist, partial agonist, and partial antagonist.

This invention describes compounds of **Formula I**, which have FPR2 receptor biological activity. The compounds in accordance with the present invention are thus of use in medicine, for example in the treatment of humans with diseases and conditions that are alleviated by FPR2 modulation.

In a first aspect, the present invention provides a compound represented by **Formula I**:



Formula I

wherein:

R^1 is optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$, $-C(O)R^{14}$ or $-OR^{15}$;

R^2 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$, $-C(O)R^{14}$ or $-OR^{15}$;

R^3 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$, $-C(O)R^{14}$ or $-OR^{15}$;

R^4 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$, $-C(O)R^{14}$ or $-OR^{15}$;

R^5 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$, $-C(O)R^{14}$ or $-OR^{15}$;

R^6 is H, optionally substituted C_{1-8} alkyl, optionally substituted heterocycle, $-(CH_2)_pCOOH$, $-(CH_2)_pNH_2$, $-(CH_2)_pOH$, $-(CH_2)_pSH$, $-(CH_2)_pCONH_2$, $-(CH_2)_pCONH_2$, $-CH(OH)CH_3$, $-(CH_2)_pSCH_3$, $-(CH_2)_pNH-C(=NH)(NH_2)$ or $-CH_2C_{6-10}aryl$, wherein said $-C_{6-10}aryl$ is optionally substituted;

R^{6a} is H or optionally substituted C_{1-8} alkyl;

R^7 is H or optionally substituted C_{1-8} alkyl;

R^8 is H;

R^9 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl or optionally substituted C_{3-8} cycloalkenyl;

R^{10} is $-(CH_2)_nOR^{16}$, $-(CH_2)_nS(O)_2OH$, $-(CH_2)_nC(O)R^{17}$, $-(CH_2)_nOS(O)_2OH$, $-(CH_2)_nNR^{18}R^{19}$, $-(CH_2)_nP(O)(OC_{1-6} \text{ alkyl})_2$, $-(CH_2)_nP(O)(OC_{1-6} \text{ alkyl})OH$, $-(CH_2)_nP(O)(OH)_2$ or optionally substituted heterocycle;

R^{11} is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl or optionally substituted C_{3-8} cycloalkenyl;

R^{12} is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl or optionally substituted C_{3-8} cycloalkenyl;

R^{13} is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, OH or optionally substituted C_{3-8} cycloalkenyl;

R^{14} is optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl or $-OR^{15}$;

R^{15} is H or optionally substituted C_{1-8} alkyl;

R^{16} is H, $-C(O)(C_{1-8} \text{ alkyl})$ or optionally substituted C_{1-8} alkyl;

R^{17} is OH, $-OC_{1-8} \text{ alkyl}$ or $C_{1-8} \text{ alkyl}$;

R^{18} is selected from the group consisting of H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, $-C(O)R^{17}$ and $-S(O)_2N(C_{1-8} \text{ alkyl})_2$;

R^{19} is selected from the group consisting of H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, or optionally substituted C_{3-8} cycloalkenyl, $-C(O)R^{17}$ and $-S(O)_2N(C_{1-8} \text{ alkyl})_2$;

p is 1, 2 or 3;

n is 0, 1, 2, 3, 4, 5, 6, 7 or 8; and

m is 0, 1 or 2;

wherein

each C_{1-8} alkyl substituent is independently selected from the group consisting of halogen, hydroxyl, $-OC_{1-8} \text{ alkyl}$, $C_{3-8} \text{ cycloalkyl}$, amino, heterocycle, $C_{6-10} \text{ aryl}$, carboxylic acid, phosphonic acid, sulphonic acid, phosphoric acid, nitro, amide, sulfonamide, carboxylate ester and ketone;

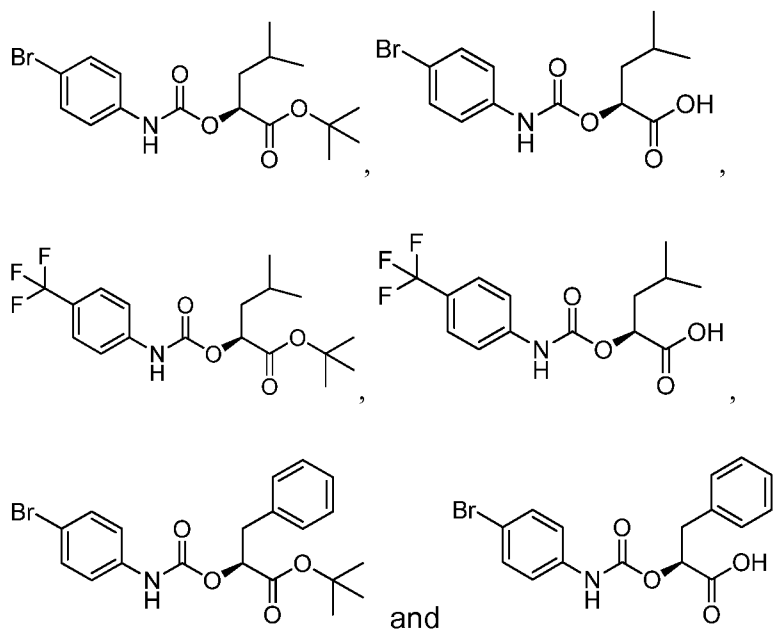
each C₃₋₈ cycloalkyl substituent is independently selected from the group consisting of halogen, hydroxyl, sulfonyl C₁₋₈ alkyl, sulfoxide C₁₋₈ alkyl, sulfonamide, nitro, -OC₁₋₈ alkyl, -SC₁₋₈ alkyl groups, -C₁₋₈ alkyl, ketone, alkylamino, amino, C₆₋₁₀ aryl and C₃₋₈ cycloalkyl;

5 each heterocycle substituent is independently selected from the group consisting of halogen, hydroxyl, -OC₁₋₈ alkyl, sulfonyl C₁₋₈ alkyl, sulfoxide C₁₋₈ alkyl, nitro, -SC₁₋₈ alkyl, -C₁₋₈ alkyl, ketone, alkylamino, amino, C₆₋₁₀ aryl and C₃₋₈ cycloalkyl;

each C₆₋₁₀ aryl substituent is independently selected from the group consisting of halogen, hydroxyl, sulfonyl C₁₋₈ alkyl, sulfoxide C₁₋₈ alkyl, sulfonamide, carboxylic acid, C₁₋₈ alkyl carboxylate (ester), amide, nitro, -OC₁₋₆ alkyl, -SC₁₋₈ alkyl, -C₁₋₈ alkyl, ketone, alkylamino, amino and C₃₋₈ cycloalkyl; and

each C₃₋₈ cycloalkenyl substituent is independently selected from the group consisting of halogen, hydroxyl, sulfonyl C₁₋₈ alkyl, sulfoxide C₁₋₈ alkyl, nitro, -OC₁₋₆ alkyl, -SC₁₋₆ alkyl, -C₁₋₆ alkyl, ketone, alkylamino, amino, C₆₋₁₀ aryl and C₃₋₈ cycloalkyl; or an enantiomer, diastereomer or tautomer thereof; or a pharmaceutically acceptable salt of any of the foregoing.

The invention further provides for a compound selected from the group consisting of:



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In a second aspect, the present invention provides a compound selected from the group consisting of:

(S)-tert-Butyl 2-(((4-Bromophenyl)carbamoyl)oxy)-4-methylpentanoate;

(2S)-2-(((4-Bromophenyl)carbamoyl)oxy)-4-methylpentanoic acid;

5 tert-Butyl (2S)-4-Methyl-2-(((4-(trifluoromethyl)phenyl)carbamoyl)oxy)pentanoate;

(2S)-4-Methyl-2-(((4-(Trifluoromethyl)phenyl)carbamoyl)oxy)pentanoic acid;

tert-Butyl (2S)-2-(((4-bromophenyl)amino)carbonyl)oxy)-3-phenyl propanoate; and

(2S)-2-(((4-bromophenyl)amino)carbonyl)oxy)-3-phenylpropanoic acid;

and enantiomers, diastereomers and tautomers thereof;

10 and salts of the foregoing.

In a third aspect, the present invention provides a pharmaceutical composition comprising as active ingredient a therapeutically effective amount of a compound according to the first or second aspects and a pharmaceutically acceptable
15 adjuvant, diluent or carrier.

In a fourth aspect, the present invention provides a method of treating an ocular inflammatory disease or condition in a subject in need of such treatment, the method comprising administering to the subject a pharmaceutical composition
20 comprising a therapeutically effective amount of a compound according to the first or second aspects, wherein the ocular inflammatory disease or condition is alleviated by the modulation of FPR2.

In a fifth aspect, the present invention provides a method of treating dermal inflammation or a dermal disease in a subject in need of such treatment, the method comprising administering to the subject a pharmaceutical composition
25 comprising a therapeutically effective amount of a compound according to the first or second aspects, wherein the dermal inflammation or dermal disease is alleviated by the modulation of FPR2.

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In a sixth aspect, the present invention provides use of a compound according to the first or second aspects in the manufacture of a medicament for treating an

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ocular inflammatory disease or condition, wherein the ocular inflammatory disease or condition is alleviated by the modulation of FPR2.

5 In a seventh aspect, the present invention provides the use of a compound according to the first or second aspects in the manufacture of a medicament for treating dermal inflammation or a dermal disease, wherein the dermal inflammation or dermal disease is alleviated by the modulation of FPR2.

The term "alkyl", as used herein, refers to saturated, monovalent or divalent hydrocarbon moieties having linear or branched moieties or combinations thereof and containing 1 to 8 carbon atoms; one methylene (-CH₂-) group of the alkyl group can be replaced by oxygen, sulfur, sulfoxide, -N(R^x)- (wherein R^x is H, OH, or
5 optionally substituted C₁₋₈ alkyl), carbonyl, carboxyl, sulfonyl, sulfate, sulfonate, amide, sulfonamide, by a divalent C₃₋₈ cycloalkyl, by a divalent heterocycle, or by a divalent aryl group. Alkyl groups can have one or more chiral centers. Alkyl groups can be independently substituted with one or more halogen atoms, hydroxyl groups, -OC₁₋₈
10 alkyl groups, cycloalkyl groups, amino groups, heterocyclic groups, aryl groups, carboxylic acid groups, phosphonic acid groups, sulphonic acid groups, phosphoric acid groups, nitro groups, amide groups, sulfonamide groups, ester groups, and/or ketone groups.

The term "cycloalkyl", as used herein, refers to a monovalent or divalent group of 3 to 8 carbon atoms derived from a saturated cyclic hydrocarbon. Cycloalkyl
15 groups can be monocyclic or polycyclic. Cycloalkyl can be independently substituted with one or more halogen atoms, sulfonyl C₁₋₈ alkyl groups, sulfoxide C₁₋₈ alkyl groups, sulfonamide groups, nitro groups, -OC₁₋₈ alkyl groups, -SC₁₋₈ alkyl groups, -C₁₋₈ alkyl groups, ketone groups, alkylamino groups, amino groups, aryl groups, C₃₋₈ cycloalkyl groups and/or hydroxyl groups.

20 The term "cycloalkenyl", as used herein, refers to a monovalent or divalent group of 3 to 8 carbon atoms derived from a saturated cycloalkyl having at least one double bond. Cycloalkenyl groups can be monocyclic or polycyclic. Cycloalkenyl groups can be independently substituted with one or more halogen atoms, sulfonyl groups, sulfoxide groups, nitro groups, -OC₁₋₆ alkyl groups, -SC₁₋₆ alkyl groups, -C₁₋₆
25 alkyl groups, ketone groups, alkylamino groups, amino groups, aryl groups, C₃₋₈ cycloalkyl groups and/or hydroxyl groups.

The term "halogen", as used herein, refers to an atom of fluorine, chlorine, bromine, iodine.

30 The term "heterocycle" as used herein, refers to a 3 to 10 membered ring, which can be aromatic or non-aromatic, saturated or unsaturated, containing at least one heteroatom selected from oxygen, nitrogen, sulfur, or combinations of at least

two thereof, interrupting the carbocyclic ring structure. The heterocyclic ring can be interrupted by a C=O; the S and N heteroatoms can be oxidized. Heterocycles can be monocyclic or polycyclic. Heterocyclic ring moieties can be substituted with one or more halogen atoms, sulfonyl groups, sulfoxide groups, nitro groups, -OC₁₋₈ alkyl groups, -SC₁₋₈ alkyl groups, -C₁₋₈ alkyl groups, ketone groups, alkylamino groups, amino groups, aryl groups, C₃₋₈ cycloalkyl groups and/or hydroxyl groups.

The term "aryl" as used herein, refers to an organic moiety derived from an aromatic hydrocarbon consisting of a ring containing 6 to 10 carbon atoms, by removal of one hydrogen atom. Aryl can be substituted with one or more halogen atoms, sulfonyl C₁₋₈ alkyl groups, sulfoxide C₁₋₈ alkyl groups, sulfonamide groups, carboxylic acid groups, C₁₋₈ alkyl carboxylates (ester) groups, amide groups, nitro groups, -OC₁₋₆ alkyl groups, -SC₁₋₈ alkyl groups, -C₁₋₈ alkyl groups, ketone groups, alkylamino groups, amino groups, C₃₋₈ cycloalkyl groups and/or hydroxyl groups. Aryls can be monocyclic or polycyclic.

The term "hydroxyl" as used herein, represents a group of formula "-OH".

The term "carbonyl" as used herein, represents a group of formula "-C(O)-".

The term "ketone" as used herein, represents an organic compound having a carbonyl group linked to a carbon atom such as -C(O)R^x wherein R^x can be alkyl, aryl, cycloalkyl, cycloalkenyl or heterocycle, as defined above.

The term "ester" as used herein, represents an organic compound having a carbonyl group linked to a carbon atom such as -C(O)OR^x wherein R^x can be alkyl, aryl, cycloalkyl, cycloalkenyl or heterocycle, as defined above.

The term "amine" as used herein, represents a group of formula "-NR^xR^y", wherein R^x and R^y can be the same or independently H, alkyl, aryl, cycloalkyl, cycloalkenyl or heterocycle, as defined above.

The term "carboxyl" as used herein, represents a group of formula "-C(O)O-".

The term "sulfonyl" as used herein, represents a group of formula "-SO₂-".

The term "sulfate" as used herein, represents a group of formula "-OS(O)₂O-".

The term "sulfonate" as used herein, represents a group of the formula " $-\text{S}(\text{O})_2\text{O}^-$ ".

The term "carboxylic acid" as used herein, represents a group of formula " $-\text{C}(\text{O})\text{OH}$ ".

5 The term "nitro" as used herein, represents a group of formula " $-\text{NO}_2$ ".

The term "amide" as used herein, represents a group of formula " $-\text{C}(\text{O})\text{NR}^x\text{R}^y$," wherein R^x and R^y can be the same or independently H, alkyl, aryl, cycloalkyl, cycloalkenyl or heterocycle, as defined above.

10 The term "sulfonamide" as used herein, represents a group of formula " $-\text{S}(\text{O})_2\text{NR}^x\text{R}^y$ " wherein R^x and R^y can be the same or independently H, alkyl, aryl, cycloalkyl, cycloalkenyl or heterocycle, as defined above.

The term "sulfoxide" as used herein, represents a group of formula " $-\text{S}(\text{O})-$ ".

The term "phosphonic acid" as used herein, represents a group of formula " $-\text{P}(\text{O})(\text{OH})_2$ ".

15 The term "phosphoric acid" as used herein, represents a group of formula " $-\text{OP}(\text{O})(\text{OH})_2$ ".

The term "sulphonic acid" as used herein, represents a group of formula " $-\text{S}(\text{O})_2\text{OH}$ ".

The formula "H", as used herein, represents a hydrogen atom.

20 The formula "O", as used herein, represents an oxygen atom.

The formula "N", as used herein, represents a nitrogen atom.

The formula "S", as used herein, represents a sulfur atom.

Some compounds of the invention are:

25 *tert*-Butyl {[[(2S)-2-[[[4-Bromophenyl]carbamoyl]oxy]-4-methyl pentanoyl]amino} acetate;

tert-Butyl {[[(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetate;

tert-Butyl {[[(2S)-2-{{[4-Bromophenyl]carbamoyl}oxy}-4-methylpentanoyl](methyl)amino}acetate;

- 5 (2S)-1-[(2-Hydroxyethyl)(methyl amino)-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate;

Diethyl ({[(2S)-4-methyl-2-({[4-(Trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}methyl)phosphonate;

- 10 (2S)-1-[(2-Hydroxyethyl)amino]-4-Methyl-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;

(2S)-1-[(2-Hydroxyethyl)amino]-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate;

Diethyl ({[(2S)-2-{{[4-bromophenyl]carbamoyl}oxy}-4-methylpentanoyl]amino}methyl)phosphonate;

- 15 tert-Butyl {[[(2S)-2-{{[4-Bromophenyl]carbamoyl}oxy}-4-methylpentanoyl](propyl)amino}acetate;

tert-Butyl {[[(2S)-2-{{[4-Bromophenyl]carbamoyl}oxy}-4-methylpentanoyl](propan-2-yl)amino}acetate;

- 20 tert-Butyl {[[(2S)-2-{{[4-Bromophenyl]carbamoyl}oxy}-4-methylpentanoyl](ethyl)amino}acetate;

tert-Butyl {Methyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetate;

tert-Butyl {Ethyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetate;

- 25 (2S)-4-Methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl (4-bromophenyl)carbamate;

(2S)-4-methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;

(2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl (4-bromophenyl)carbamate;

5 (2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;

2-[[{(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyl}oxy)pentanoyl]amino}ethyl acetate;

{{(2S)-2-{{(4-Bromophenyl)carbamoyl}oxy}-4-methylpentanoyl]amino}acetic acid;

10 {{(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetic acid;

{{(2S)-2-{{(4-Bromophenyl) carbamoyl}oxy}-4-methylpentanoyl](methyl)amino}acetic acid;

15 {{(2S)-2-{{(4-Bromophenyl)carbamoyl}oxy}-4-methylpentanoyl](propyl)amino}acetic acid;

{{(2S)-2-{{(4-Bromophenyl)carbamoyl}oxy}-4-methylpentanoyl](propan-2-yl)amino}acetic acid;

{{(2S)-2-{{(4-Bromophenyl) carbamoyl}oxy}-4-methylpentanoyl](ethyl)amino}acetic acid;

20 {Methyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyl}oxy)pentanoyl]amino}acetic acid;

{Ethyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyl}oxy)pentanoyl]amino}acetic acid;

25 (2S)-4-Methyl-1-{methyl[2-(sulfooxy)ethyl]amino}-1-oxopentan-2-yl (4-bromophenyl)carbamate;

{{(2S)-4-methyl-2-[[{4-(trifluoromethyl)phenyl}amino}carbonyl]oxy]pentanoyl}amino)methanesulfonic acid;

tert-Butyl [{(2S)-4-methyl-2-[[{4-(trifluoromethyl)phenyl}amino}carbonyl]oxy]pentanoyl}(propyl)amino]acetate;

5 tert-Butyl (isopropyl){(2S)-4-methyl-2-[[{4-(trifluoromethyl)phenyl}amino}carbonyl]oxy]pentanoyl}amino]acetate;

(1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate;

10 (1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl [4-(trifluoromethyl)phenyl]carbamate;

(1S)-1-[[{2-[(tert-butoxycarbonyl)amino]ethyl}amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate;

tert-Butyl [{(2S)-2-[[{4-bromophenyl}amino]carbonyl]oxy}-3-phenylpropanoyl]amino}acetate;

15 (1S)-1-benzyl-2-oxo-2-[(1H-tetrazol-5-ylmethyl)amino]ethyl (4-bromophenyl)carbamate;

tert-Butyl [{(2S)-2-[[{4-bromophenyl}amino]carbonyl]oxy}-3-phenylpropanoyl](methyl)amino} acetate;

20 [{(2S)-4-methyl-2-[[{4-(trifluoromethyl)phenyl}amino}carbonyl]oxy]pentanoyl}(propyl)amino]acetic acid;

(Isopropyl){(2S)-4-methyl-2-[[{4-(trifluoromethyl)phenyl}amino}carbonyl]oxy]pentanoyl}amino}acetic acid;

(1S)-1-[[{2-aminoethyl}amino]carbonyl]-3-methylbutyl (4-bromophenyl) carbamate;

25 [{(2S)-2-[[{4-bromophenyl}amino]carbonyl]oxy}-3-phenylpropanoyl] amino}acetic acid;

{[(2S)-2-({[(4-Bromophenyl)amino]carbonyl}oxy)-3-phenylpropanoyl]
(methyl)amino}acetic acid; and

(1S)-1-[(2-({[(Dimethylamino)sulfonyl]amino}ethyl)amino]carbonyl)-3-methylbutyl (4-bromophenyl)carbamate.

5 Additional compounds of the invention are:

(S)-tert-Butyl 2-(((4-Bromophenyl)carbamoyl)oxy)-4-methylpentanoate;

(2S)-2-({[(4-Bromophenyl)carbamoyl]oxy)-4-methylpentanoic acid;

tert-Butyl (2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyl}oxy)pentanoate;

(2S)-4-Methyl-2-({[4-(Trifluoromethyl)phenyl]carbamoyl}oxy)pentanoic acid;

10 tert-Butyl (2S)-2-({[(4-bromophenyl)amino]carbonyl}oxy)-3-phenyl propanoate; and

(2S)-2-({[(4-bromophenyl)amino]carbonyl}oxy)-3-phenylpropanoic acid.

Some compounds of Formula I and some of their intermediates have at least one asymmetric center in their structure. This asymmetric center may be present in an R or S configuration, said R and S notation is used in correspondence with the
15 rules described in Pure Appl. Chem. (1976), 45, 11-13.

The term “pharmaceutically acceptable salts” refers to salts or complexes that retain the desired biological activity of the above identified compounds and exhibit minimal or no undesired toxicological effects. The “pharmaceutically acceptable salts” according to the invention include therapeutically active, non-toxic base or acid
20 salt forms, which the compounds of Formula I are able to form.

The acid addition salt form of a compound of Formula I that occurs in its free form as a base can be obtained by treating the free base with an appropriate acid such as an inorganic acid, for example, hydrochloric acid, hydrobromic acid, sulfuric acid, phosphoric acid, nitric acid and the like; or an organic acid such as for example,
25 acetic acid, hydroxyacetic acid, propanoic acid, lactic acid, pyruvic acid, malonic acid, fumaric acid, maleic acid, oxalic acid, tartaric acid, succinic acid, malic acid, ascorbic acid, benzoic acid, tannic acid, pamoic acid, citric acid, methylsulfonic acid,

ethanesulfonic acid, benzenesulfonic acid, formic and the like (Handbook of Pharmaceutical Salts, P. Heinrich Stahl & Camille G. Wermuth (Eds), Verlag Helvetica Chimica Acta- Zürich, 2002, 329-345).

The base addition salt form of a compound of Formula I that occurs in its acid
5 form can be obtained by treating the acid with an appropriate base such as an inorganic base, for example, sodium hydroxide, magnesium hydroxide, potassium hydroxide, calcium hydroxide, ammonia and the like; or an organic base such as for example, L-Arginine, ethanolamine, betaine, benzathine, morpholine and the like. (Handbook of Pharmaceutical Salts, P. Heinrich Stahl & Camille G. Wermuth (Eds),
10 Verlag Helvetica Chimica Acta- Zürich, 2002, 329-345).

The compounds of the invention are indicated for use in treating or preventing conditions in which there is likely to be a component involving the N-formyl peptide receptor 2.

In another embodiment, there are provided pharmaceutical compositions
15 including at least one compound of the invention in a pharmaceutically acceptable carrier.

In a further embodiment of the invention, there are provided methods for treating disorders associated with modulation of the N-formyl peptide 2 receptor.

Such methods can be performed, for example, by administering to a subject in
20 need thereof a pharmaceutical composition containing a therapeutically effective amount of at least one compound of the invention.

Therapeutic utilities of the N-formyl peptide 2 receptor modulators are ocular inflammatory diseases and conditions including, but not limited to, wet and dry age-related macular degeneration (ARMD), uveitis, dry eye, keratitis, allergic eye disease
25 and conditions affecting the posterior part of the eye, such as maculopathies and retinal degeneration including non-exudative age related macular degeneration, exudative age related macular degeneration, choroidal neovascularization, diabetic retinopathy (proliferative), retinopathy of prematurity (ROP), acute macular neuroretinopathy, central serous chorioretinopathy, cystoid macular edema, and
30 diabetic macular edema; infectious keratitis, herpetic keratitis, corneal angiogenesis,

lymphangiogenesis, retinitis, choroiditis such as acute multifocal placoid pigment epitheliopathy, Behcet's disease, birdshot retinochoroidopathy, infectious (syphilis, lyme, tuberculosis, toxoplasmosis), intermediate uveitis (pars planitis), multifocal choroiditis, multiple evanescent white dot syndrome (mewds), ocular sarcoidosis, 5 posterior scleritis, serpiginous choroiditis, subretinal fibrosis and uveitis syndrome, Vogt-Koyanagi-and Harada syndrome; vasuclar diseases/exudative diseases such as retinal arterial occlusive disease, central retinal vein occlusion, cystoids macular edema, disseminated intravascular coagulopathy, branch retinal vein occlusion, hypertensive fundus changes, ocular ischemic syndrome, retinal arterial 10 microaneurysms, Coat's disease, parafoveal telangiectasis, hemi-retinal vein occlusion, papillophlebitis, central retinal artery occlusion, branch retinal artery occlusion, carotid artery disease (CAD), frosted branch angiitis, sickle cell retinopathy and other hemoglobinopathies, angioid streaks, familial exudative vitreoretinopathy, and Eales disease; traumatic/surgical conditions such as 15 sympathetic ophthalmia, uveitic retinal disease, retinal detachment, trauma, post surgical corneal wound healing, post-cataract surgical inflammation, conditions caused by laser, conditions caused by photodynamic therapy, photocoagulation, hypoperfusion during surgery, radiation retinopathy, and bone marrow transplant retinopathy; proliferative disorders such as proliferative vitreal retinopathy and 20 epiretinal membranes, and proliferative diabetic retinopathy; infectious disorders such as ocular histoplasmosis, ocular toxocariasis, presumed ocular histoplasmosis syndrome (POHS), endophthalmitis, toxoplasmosis, retinal diseases associated with HIV infection, choroidal disease associate with HIV infection, uveitic disease associate with HIV infection, viral retinitis, acute retinal necrosis, progressive outer 25 retinal necrosis, fungal retinal diseases, ocular syphilis, ocular tuberculosis, diffuse unilateral subacute neuroretinitis, and myiasis; genetic disorders such as retinitis pigmentosa, systemic disorders with accosiated retinal dystrophies, congenital stationary night blindness, cone dystrophies, Stargardt's disease and fundus flavimaculatus, Best's disease, pattern dystrophy of the retinal pigmented epithelium, 30 X-linked retinoschisis, Sorsby's fundus dystrophy, benign concentric maculopathy, Bietti's crystalline dystrophy, and pseudoxanthoma elasticum; retinal tears/holes such as retinal detachment, macular hole, and giant retinal tear; tumors such as retinal disease associated with tumors, congenital hypertrophy of the retinal pigmented epithelium, posterior uveal melanoma, choroidal hemangioma, choroidal

osteoma, choroidal metastasis, combined hamartoma of the retina and retinal pigmented epithelium, retinoblastoma, vasoproliferative tumors of the ocular fundus, retinal astrocytoma, and intraocular lymphoid tumors; and miscellaneous other diseases affecting the posterior part of the eye such as punctate inner
5 choroidopathy, acute posterior multifocal placoid pigment epitheliopathy, myopic retinal degeneration, and acute retinal pigment epitheliitis, systemic inflammatory diseases such as stroke, coronary artery disease, obstructive airway diseases, HIV-mediated retroviral infections, cardiovascular disorders including coronary artery disease, neuroinflammation, neurological disorders, pain and immunological
10 disorders, asthma, allergic disorders, inflammation, systemic lupus erythematosus, psoriasis, CNS disorders such as Alzheimer's disease, arthritis, sepsis, inflammatory bowel disease, cachexia, angina pectoris, post-surgical corneal inflammation, blepharitis, meibomian gland dysfunction; dermal inflammation and dermal diseases including but not limited to dermal wound healing, hypertrophic scars, keloids, burns,
15 rosacea, atopic dermatitis, acne, psoriasis, seborrheic dermatitis, actinic keratoses, basal cell carcinoma, squamous cell carcinoma, melanoma, viral warts, photoaging, photodamage, melasma, post-inflammatory hyperpigmentation, disorders of pigmentation, alopecia, scarring and non-scarring forms; viral warts, photoaging rheumatoid arthritis and related inflammatory disorders, alopecia, glaucoma, branch
20 vein occlusion, Best's vitelliform macular degeneration, retinitis pigmentosa, proliferative vitreoretinopathy (PVR), and any other degenerative disease of either the photoreceptors or the RPE (Perretti, Mauro et al. Pharmacology & Therapeutics 127 (2010) 175-188).

The compounds of the invention are useful for the treatment of mammals,
25 including humans, with a range of conditions and diseases that are alleviated by the N-formyl peptide 2 receptor modulation, including, but not limited to the treatment of wet and dry age-related macular degeneration (ARMD), dry eye, keratitis, allergic eye disease, infectious keratitis, herpetic keratitis, corneal angiogenesis, lymphangiogenesis, retinitis, choroiditis, acute multifocal placoid pigment
30 epitheliopathy, Behcet's disease, post-surgical corneal wound healing, post-cataract surgical inflammation, uveitis, diabetic retinopathy (proliferative), retinopathy of prematurity (ROP), diabetic macular edema, retinal vein occlusion, cystoid macular edema, glaucoma, branch vein occlusion, Best's vitelliform macular degeneration,

retinitis pigmentosa, proliferative vitreoretinopathy (PVR), and any other degenerative disease of either the photoreceptors or the RPE; also dermal inflammation and dermal diseases including but not limited to dermal wound healing, hypertrophic scars, keloids, burns, rosacea, atopic dermatitis, acne, psoriasis, seborrheic dermatitis, actinic keratoses, basal cell carcinoma, squamous cell carcinoma, melanoma, viral warts, photoaging, photodamage, melasma, post-inflammatory hyperpigmentation, disorders of pigmentation, alopecia, scarring and non-scarring forms.

In still another embodiment of the invention, there are provided methods for treating disorders associated with modulation of the FPR2 receptor. Such methods can be performed, for example, by administering to a subject in need thereof a therapeutically effective amount of at least one compound of the invention, or any combination thereof, or pharmaceutically acceptable salts, individual enantiomers, and/or diastereomers thereof.

The present invention concerns the use of a compound of Formula I or a pharmaceutically acceptable salt thereof, for the manufacture of a medicament for the treatment of ocular inflammatory diseases including, but not limited to, wet and dry age-related macular degeneration (ARMD), uveitis, dry eye, keratitis, allergic eye disease and conditions affecting the posterior part of the eye, such as maculopathies and retinal degeneration including non-exudative age related macular degeneration, exudative age related macular degeneration, choroidal neovascularization, diabetic retinopathy (proliferative), retinopathy of prematurity (ROP), acute macular neuroretinopathy, central serous chorioretinopathy, cystoid macular edema, and diabetic macular edema; infectious keratitis, herpetic keratitis, corneal angiogenesis, lymphangiogenesis, uveitis, retinitis, and choroiditis such as acute multifocal placoid pigment epitheliopathy, Behcet's disease, birdshot retinochoroidopathy, infectious (syphilis, lyme, tuberculosis, toxoplasmosis) intermediate uveitis (pars planitis), multifocal choroiditis, multiple evanescent white dot syndrome (mewds), ocular sarcoidosis, posterior scleritis, serpiginous choroiditis, subretinal fibrosis and uveitis syndrome, Vogt-Koyanagi-and Harada syndrome; vasuclar diseases/exudative diseases such as retinal arterial occlusive disease, central retinal vein occlusion, cystoids macular edema, disseminated intravascular coagulopathy, branch retinal

vein occlusion, hypertensive fundus changes, ocular ischemic syndrome, retinal arterial microaneurysms, Coat's disease, parafoveal telangiectasis, hemi-retinal vein occlusion, papillophlebitis, central retinal artery occlusion, branch retinal artery occlusion, carotid artery disease (CAD), frosted branch angiitis, sickle cell
5 retinopathy and other hemoglobinopathies, angioid streaks, familial exudative vitreoretinopathy, and Eales disease; traumatic/surgical conditions such as sympathetic ophthalmia, uveitic retinal disease, retinal detachment, trauma, post surgical corneal wound healing, post-cataract surgical inflammation, wet and dry age-related macular degeneration (ARMD), conditions caused by laser, conditions
10 caused by photodynamic therapy, photocoagulation, hypoperfusion during surgery, radiation retinopathy, and bone marrow transplant retinopathy; proliferative disorders such as proliferative vitreal retinopathy and epiretinal membranes, and proliferative diabetic retinopathy; infectious disorders such as ocular histoplasmosis, ocular toxocariasis, presumed ocular histoplasmosis syndrome (POHS), endophthalmitis,
15 toxoplasmosis, retinal diseases associated with HIV infection, choroidal disease associate with HIV infection, uveitic disease associate with HIV infection, viral retinitis, acute retinal necrosis, progressive outer retinal necrosis, fungal retinal diseases, ocular syphilis, ocular tuberculosis, diffuse unilateral subacute neuroretinitis, and myiasis; genetic disorders such as retinitis pigmentosa, systemic
20 disorders with accosiated retinal dystrophies, congenital stationary night blindness, cone dystrophies, Stargardt's disease and fundus flavimaculatus, Best's disease, pattern dystrophy of the retinal pigmented epithelium, X-linked retinoschisis, Sorsby's fundus dystrophy, benign concentric maculopathy, Bietti's crystalline dystrophy, and pseudoxanthoma elasticum; retinal tears/holes such as retinal
25 detachment, macular hole, and giant retinal tear; tumors such as retinal disease associated with tumors, congenital hypertrophy of the retinal pigmented epithelium, posterior uveal melanoma, choroidal hemangioma, choroidal osteoma, choroidal metastasis, combined hamartoma of the retina and retinal pigmented epithelium, retinoblastoma, vasoproliferative tumors of the ocular fundus, retinal astrocytoma,
30 and intraocular lymphoid tumors; and miscellaneous other diseases affecting the posterior part of the eye such as punctate inner choroidopathy, acute posterior multifocal placoid pigment epitheliopathy, myopic retinal degeneration, and acute retinal pigment epitheliitis, systemic inflammatory diseases such as stroke, coronary artery disease, obstructive airway diseases, HIV-mediated retroviral

infections, cardiovascular disorders including coronary artery disease, neuroinflammation, neurological disorders, pain and immunological disorders, asthma, allergic disorders, inflammation, systemic lupus erythematosus, CNS disorders such as Alzheimer's disease, arthritis, sepsis, inflammatory bowel disease, cachexia, angina pectoris, post-surgical corneal inflammation, blepharitis, meibomian gland dysfunction, viral warts, photoaging rheumatoid arthritis and related inflammatory disorders, alopecia, glaucoma, branch vein occlusion, Best's vitelliform macular degeneration, retinitis pigmentosa, proliferative vitreoretinopathy (PVR), and any other degenerative disease of either the photoreceptors or the RPE; dermal inflammation and dermal diseases including but not limited to dermal wound healing, hypertrophic scars, keloids, burns, rosacea, atopic dermatitis, acne, psoriasis, seborrheic dermatitis, actinic keratoses, basal cell carcinoma, squamous cell carcinoma, melanoma, viral warts, photoaging, photodamage, melasma, post-inflammatory hyperpigmentation, disorders of pigmentation, alopecia, scarring and non-scarring forms.

The actual amount of the compound to be administered in any given case will be determined by a physician taking into account the relevant circumstances, such as the severity of the condition, the age and weight of the patient, the patient's general physical condition, the cause of the condition, and the route of administration.

The patient will be administered the compound orally in any acceptable form, such as a tablet, liquid, capsule, powder and the like, or other routes may be desirable or necessary, particularly if the patient suffers from nausea. Such other routes may include, without exception, transdermal, parenteral, subcutaneous, intranasal, via an implant stent, intrathecal, intravitreal, topical to the eye, back to the eye, intramuscular, intravenous, and intrarectal modes of delivery. Additionally, the formulations may be designed to delay release of the active compound over a given period of time, or to carefully control the amount of drug released at a given time during the course of therapy.

In another embodiment of the invention, there are provided pharmaceutical compositions including at least one compound of the invention in a pharmaceutically acceptable carrier thereof. The phrase "pharmaceutically acceptable" means the

carrier, diluent or excipient must be compatible with the other ingredients of the formulation and not deleterious to the recipient thereof.

Pharmaceutical compositions of the present invention can be used in the form of a solid, a solution, an emulsion, a dispersion, a patch, a micelle, a liposome, and the like, wherein the resulting composition contains one or more compounds of the present invention, as an active ingredient, in admixture with an organic or inorganic carrier or excipient suitable for enteral or parenteral applications. Invention compounds may be combined, for example, with the usual non-toxic, pharmaceutically acceptable carriers for tablets, pellets, capsules, suppositories, solutions, emulsions, suspensions, and any other form suitable for use. The carriers which can be used include glucose, lactose, gum acacia, gelatin, mannitol, starch paste, magnesium trisilicate, talc, corn starch, keratin, colloidal silica, potato starch, urea, medium chain length triglycerides, dextrans, and other carriers suitable for use in manufacturing preparations, in solid, semisolid, or liquid form. In addition, auxiliary, stabilizing, thickening and coloring agents and perfumes may be used. Invention compounds are included in the pharmaceutical composition in an amount sufficient to produce the desired effect upon the process or disease condition.

Pharmaceutical compositions containing invention compounds may be in a form suitable for oral use, for example, as tablets, troches, lozenges, aqueous or oily suspensions, dispersible powders or granules, emulsions, hard or soft capsules, or syrups or elixirs. Compositions intended for oral use may be prepared according to any method known in the art for the manufacture of pharmaceutical compositions and such compositions may contain one or more agents selected from the group consisting of a sweetening agent such as sucrose, lactose, or saccharin, flavoring agents such as peppermint, oil of wintergreen or cherry, coloring agents and preserving agents in order to provide pharmaceutically elegant and palatable preparations. Tablets containing invention compounds in admixture with non-toxic pharmaceutically acceptable excipients may also be manufactured by known methods. The excipients used may be, for example, (1) inert diluents such as calcium carbonate, lactose, calcium phosphate or sodium phosphate; (2) granulating and disintegrating agents such as corn starch, potato starch or alginic acid; (3) binding agents such as gum tragacanth, corn starch, gelatin or acacia, and (4)

lubricating agents such as magnesium stearate, stearic acid or talc. The tablets may be uncoated or they may be coated by known techniques to delay disintegration and absorption in the gastrointestinal tract and thereby provide a sustained action over a longer period. For example, a time delay material such as glyceryl monostearate or
5 glyceryl distearate may be employed.

In some cases, formulations for oral use may be in the form of hard gelatin capsules wherein the invention compounds are mixed with an inert solid diluent, for example, calcium carbonate, calcium phosphate or kaolin. They may also be in the form of soft gelatin capsules wherein the invention compounds are mixed with water
10 or an oil medium, for example, peanut oil, liquid paraffin or olive oil.

Pharmaceutical compositions containing invention compounds may be in a form suitable for topical use, for example, as oily suspensions, as solutions or suspensions in aqueous liquids or nonaqueous liquids, or as oil-in-water or water-in-oil liquid emulsions. Pharmaceutical compositions may be prepared by combining a
15 therapeutically effective amount of at least one compound according to the present invention, or a pharmaceutically acceptable salt thereof, as an active ingredient with conventional ophthalmically acceptable pharmaceutical excipients and by preparation of unit dosage suitable for topical ocular use. The therapeutically efficient amount typically is between about 0.0001 and about 5% (w/v), preferably about
20 0.001 to about 2.0% (w/v) in liquid formulations.

For ophthalmic application, preferably solutions are prepared using a physiological saline solution as a major vehicle. The pH of such ophthalmic solutions should preferably be maintained between 4.5 and 8.0 with an appropriate buffer system, a neutral pH being preferred but not essential. The formulations may also
25 contain conventional pharmaceutically acceptable preservatives, stabilizers and surfactants. Preferred preservatives that may be used in the pharmaceutical compositions of the present invention include, but are not limited to, benzalkonium chloride, chlorobutanol, thimerosal, phenylmercuric acetate and phenylmercuric nitrate. A preferred surfactant is, for example, Tween 80. Likewise, various preferred
30 vehicles may be used in the ophthalmic preparations of the present invention. These vehicles include, but are not limited to, polyvinyl alcohol, povidone, hydroxypropyl

methyl cellulose, poloxamers, carboxymethyl cellulose, hydroxyethyl cellulose cyclodextrin and purified water.

Tonicity adjustors may be added as needed or convenient. They include, but are not limited to, salts, particularly sodium chloride, potassium chloride, mannitol
5 and glycerin, or any other suitable ophthalmically acceptable tonicity adjustor.

Various buffers and means for adjusting pH may be used so long as the resulting preparation is ophthalmically acceptable. Accordingly, buffers include acetate buffers, citrate buffers, phosphate buffers and borate buffers. Acids or bases may be used to adjust the pH of these formulations as needed.

10 In a similar manner an ophthalmically acceptable antioxidant for use in the present invention includes, but is not limited to, sodium metabisulfite, sodium thiosulfate, acetylcysteine, butylated hydroxyanisole and butylated hydroxytoluene.

Other excipient components which may be included in the ophthalmic preparations are chelating agents. The preferred chelating agent is edentate
15 disodium, although other chelating agents may also be used in place of or in conjunction with it.

The ingredients are usually used in the following amounts:

	Ingredient	Amount (% w/v)
	active ingredient	about 0.001-5
20	preservative	0-0.10
	vehicle	0-40
	tonicity adjustor	0-10
	buffer	0.01-10
	pH adjustor	q .s. pH 4.5-7.8
25	antioxidant	as needed
	surfactant	as needed
	purified water	to make 100%.

The actual dose of the active compounds of the present invention depends on the specific compound, and on the condition to be treated; the selection of the appropriate dose is well within the knowledge of the skilled artisan.

The ophthalmic formulations of the present invention are conveniently
5 packaged in forms suitable for metered application, such as in containers equipped with a dropper, to facilitate application to the eye. Containers suitable for dropwise application are usually made of suitable inert, non-toxic plastic material, and generally contain between about 0.5 and about 15 ml solution. One package may contain one or more unit doses. Especially preservative-free solutions are often
10 formulated in non-resealable containers containing up to about ten, preferably up to about five unit doses, where a typical unit dose is from one to about 8 drops, preferably one to about 3 drops. The volume of one drop usually is about 20-35 microliters.

The pharmaceutical compositions may be in the form of a sterile injectable
15 suspension. This suspension may be formulated according to known methods using suitable dispersing or wetting agents and suspending agents. The sterile injectable preparation may also be a sterile injectable solution or suspension in a non-toxic parenterally-acceptable diluent or solvent, for example, as a solution in 1,3-butanediol. Sterile, fixed oils are conventionally employed as a solvent or suspending
20 medium. For this purpose any bland fixed oil may be employed including synthetic mono- or diglycerides, fatty acids (including oleic acid), naturally occurring vegetable oils like sesame oil, coconut oil, peanut oil, cottonseed oil, etc., or synthetic fatty vehicles like ethyl oleate or the like. Buffers, preservatives, antioxidants, and the like can be incorporated as required.

25

The compounds of the invention may also be administered in the form of suppositories for rectal administration of the drug. These compositions may be prepared by mixing the invention compounds with a suitable non-irritating excipient, such as cocoa butter, synthetic glyceride esters of polyethylene glycols, which are
30 solid at ordinary temperatures, but liquefy and/or dissolve in the rectal cavity to release the drug.

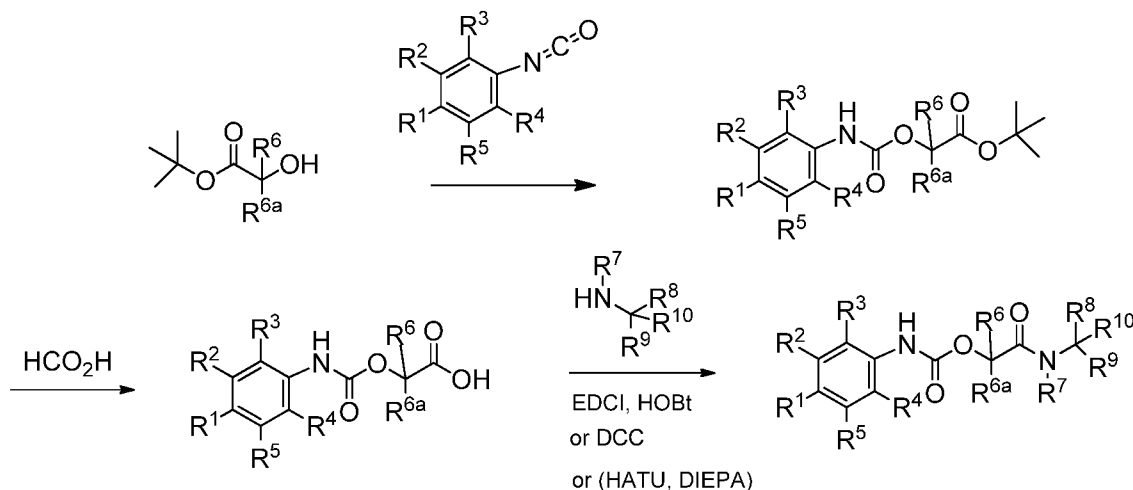
Since individual subjects may present a wide variation in severity of symptoms and each drug has its unique therapeutic characteristics, the precise mode of administration and dosage employed for each subject is left to the discretion of the practitioner.

5 The compounds and pharmaceutical compositions described herein are useful as medicaments in mammals, including humans, for treatment of diseases and/or alleviations of conditions which are responsive to treatment by agonists or functional antagonists of the N-formyl peptide 2 receptor. Thus, in further
10 embodiments of the invention, there are provided methods for treating a disorder associated with modulation of the N-formyl peptide 2 receptor. Such methods can be performed, for example, by administering to a subject in need thereof a pharmaceutical composition containing a therapeutically effective amount of at least one invention compound. As used herein, the term "therapeutically effective amount" means the amount of the pharmaceutical composition that will elicit the
15 biological or medical response of a subject in need thereof that is being sought by the researcher, veterinarian, medical doctor or other clinician. In some embodiments, the subject in need thereof is a mammal. In some embodiments, the mammal is human.

 The present invention concerns also processes for preparing the compounds
20 of Formula I. The compounds of formula I according to the invention can be prepared analogously to conventional methods as understood by the person skilled in the art of synthetic organic chemistry.

 Synthetic Scheme 1 set forth below illustrates how the compounds according to the invention can be made. Those skilled in the art will be able to routinely modify
25 and/or adapt the following scheme to synthesize any compounds of the invention covered by Formula I or their synthetic precursors.

Scheme 1



Compounds of Formula I were prepared as depicted in Scheme 1. In general, a t-butyl ester derivative of an alpha-hydroxy carboxylic acid is reacted with a substituted phenylisocyanate to produce a phenylcarbamate derivative. The t-butyl ester protecting group is then removed under acidic conditions to give a phenylcarbamate acetic acid derivative. The carboxylic acid group is then converted to an amide by treating the compound with activating reagents, such as 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC) and hydroxybenzotriazole (HOBt) in the presence of an amine, or by other methods known to those skilled in the art.

The following abbreviations are used in the general scheme and in the examples:

Et_3N	triethylamine
CD_3OD	deuterated methanol
Na_2SO_4	sodium sulfate
DMF	N,N dimethylformamide
EDCI/EDC	1-ethyl-3-(3-dimethylaminopropyl) carbodiimide
HOBt	hydroxybenzotriazole
THF	tetrahydrofuran
TMS	tetramethylsilane
EtOAc	ethylacetate
HCO_2H	formic acid
DMAP	4-dimethylaminopyridine
DCC	N,N'-Dicyclohexylcarbodiimide

HATU 1-[Bis(dimethylamino)methylene]-1H-1,2,3-triazolo[4,5-b]pyridinium
 3-oxid hexafluorophosphate
DIEPA *N,N*-Diisopropylethylamine
HCl hydrochloric acid

5 At this stage, those skilled in the art will appreciate that many additional compounds that fall under the scope of the invention may be prepared by performing various common chemical reactions. Details of certain specific chemical transformations are provided in the examples.

DRAWINGS

10 Figure 1 shows the structure of Formula I.

DETAILED DESCRIPTION OF THE INVENTION

 It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention claimed. As used herein, the use of the singular includes
15 the plural unless specifically stated otherwise.

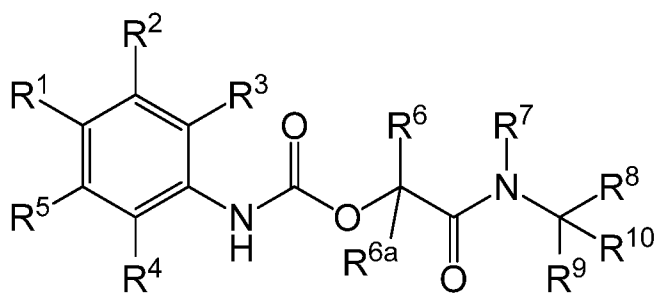
 It will be readily apparent to those skilled in the art that some of the compounds of the invention may contain one or more asymmetric centers, such that the compounds may exist in enantiomeric as well as in diastereomeric forms. Unless it is specifically noted otherwise, the scope of the present invention includes
20 all enantiomers, diastereomers and racemic mixtures. Some of the compounds of the invention may form salts with pharmaceutically acceptable acids or bases, and such pharmaceutically acceptable salts of the compounds described herein are also within the scope of the invention.

 The present invention includes all pharmaceutically acceptable isotopically
25 enriched compounds. Any compound of the invention may contain one or more isotopic atoms enriched or different than the natural ratio such as deuterium ²H (or D) in place of hydrogen ¹H (or H) or use of ¹³C enriched material in place of ¹²C and the like. Similar substitutions can be employed for N, O and S. The use of isotopes may assist in analytical as well as therapeutic aspects of the invention. For example,

use of deuterium may increase the in vivo half-life by altering the metabolism (rate) of the compounds of the invention. These compounds can be prepared in accord with the preparations described by use of isotopically enriched reagents.

The following examples are for illustrative purposes only and are not intended, nor should they be construed, as limiting the invention in any manner. Those skilled in the art will appreciate that variations and modifications of the following examples can be made without exceeding the spirit or scope of the invention.

In embodiment (1), there is provided a compound represented by Formula I:



Formula I

wherein:

R^1 is optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$, $-C(O)R^{14}$ or $-OR^{15}$;

R^2 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$, $-C(O)R^{14}$ or $-OR^{15}$;

R^3 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$, $-C(O)R^{14}$ or $-OR^{15}$;

R^4 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally

substituted C₃₋₈ cycloalkenyl, halogen, NR¹¹R¹², fluorinated C₁₋₈ alkyl, perfluorinated C₁₋₈ alkyl, -S(O)_mR¹³-C(O)R¹⁴ or -OR¹⁵;

R⁵ is H, optionally substituted C₁₋₈ alkyl, optionally substituted C₃₋₈ cycloalkyl, optionally substituted heterocycle, optionally substituted C₆₋₁₀ aryl, optionally substituted C₃₋₈ cycloalkenyl, halogen, NR¹¹R¹², fluorinated C₁₋₈ alkyl, perfluorinated C₁₋₈ alkyl, -S(O)_mR¹³-C(O)R¹⁴ or -OR¹⁵;

R⁶ is H, optionally substituted C₁₋₈ alkyl, optionally substituted heterocycle, -(CH₂)_pCOOH, -(CH₂)_pNH₂, -(CH₂)_pOH, -(CH₂)_pSH, -(CH₂)_pCONH₂, -(CH₂)_pCONH₂, -CH(OH)CH₃, -(CH₂)_pSCH₃, -(CH₂)_pNH-C(=NH)(NH₂) or -CH₂C₆₋₁₀aryl, wherein said -C₆₋₁₀aryl is optionally substituted;

R^{6a} is H or optionally substituted C₁₋₈ alkyl;

R⁷ is H or optionally substituted C₁₋₈ alkyl;

R⁸ is H;

R⁹ is H, optionally substituted C₁₋₈ alkyl, optionally substituted C₃₋₈ cycloalkyl, optionally substituted heterocycle, optionally substituted C₆₋₁₀ aryl or optionally substituted C₃₋₈ cycloalkenyl;

R¹⁰ is -(CH₂)_nOR¹⁶, -(CH₂)_nS(O)₂OH, -(CH₂)_nC(O)R¹⁷, -(CH₂)_nOS(O)₂OH, -(CH₂)_nNR¹⁸R¹⁹, -(CH₂)_nP(O)(OC₁₋₆ alkyl)₂, -(CH₂)_nP(O)(OC₁₋₆ alkyl)OH, -(CH₂)_n-P(O)(OH)₂ or optionally substituted heterocycle;

R¹¹ is H, optionally substituted C₁₋₈ alkyl, optionally substituted C₃₋₈ cycloalkyl, optionally substituted heterocycle, optionally substituted C₆₋₁₀ aryl or optionally substituted C₃₋₈ cycloalkenyl;

R¹² is H, optionally substituted C₁₋₈ alkyl, optionally substituted C₃₋₈ cycloalkyl, optionally substituted heterocycle, optionally substituted C₆₋₁₀ aryl or optionally substituted C₃₋₈ cycloalkenyl;

R¹³ is H, optionally substituted C₁₋₈ alkyl, optionally substituted C₃₋₈ cycloalkyl, optionally substituted heterocycle, optionally substituted C₆₋₁₀ aryl, OH or optionally substituted C₃₋₈ cycloalkenyl;

R¹⁴ is optionally substituted C₁₋₈ alkyl, optionally substituted C₃₋₈ cycloalkyl, optionally substituted heterocycle, optionally substituted C₆₋₁₀ aryl, optionally substituted C₃₋₈ cycloalkenyl or -OR¹⁵;

R¹⁵ is H or optionally substituted C₁₋₈ alkyl;

R¹⁶ is H, -C(O)(C₁₋₈ alkyl) or optionally substituted C₁₋₈ alkyl;

R¹⁷ is OH, -OC₁₋₈ alkyl or C₁₋₈ alkyl;

R^{18} is selected from the group consisting of H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, $-C(O)R^{17}$ and $-S(O)_2N(C_{1-8} \text{ alkyl})_2$;

5 R^{19} is selected from the group consisting of H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, or optionally substituted C_{3-8} cycloalkenyl, $-C(O)R^{17}$ and $-S(O)_2N(C_{1-8} \text{ alkyl})_2$;

p is 1, 2 or 3;

10 n is 0, 1, 2, 3, 4, 5, 6, 7 or 8; and

m is 0, 1 or 2;

wherein

each C_{1-8} alkyl substituent is independently selected from the group consisting of halogen, hydroxyl, $-OC_{1-8}$ alkyl, C_{3-8} cycloalkyl, amino, heterocycle, C_{6-10} aryl, 15 carboxylic acid, phosphonic acid, sulphonic acid, phosphoric acid, nitro, amide, sulfonamide, carboxylate ester and ketone;

each C_{3-8} cycloalkyl substituent is independently selected from the group consisting of halogen, hydroxyl, sulfonyl C_{1-8} alkyl, sulfoxide C_{1-8} alkyl, sulfonamide, nitro, $-OC_{1-8}$ alkyl, $-SC_{1-8}$ alkyl groups, $-C_{1-8}$ alkyl, ketone, alkylamino, amino, C_{6-10} 20 aryl and C_{3-8} cycloalkyl;

each heterocycle substituent is independently selected from the group consisting of halogen, hydroxyl, $-OC_{1-8}$ alkyl, sulfonyl C_{1-8} alkyl, sulfoxide C_{1-8} alkyl, nitro, $-SC_{1-8}$ alkyl, $-C_{1-8}$ alkyl, ketone, alkylamino, amino, C_{6-10} aryl and C_{3-8} cycloalkyl;

each C_{6-10} aryl substituent is independently selected from the group consisting 25 of halogen, hydroxyl, sulfonyl C_{1-8} alkyl, sulfoxide C_{1-8} alkyl, sulfonamide, carboxylic acid, C_{1-8} alkyl carboxylate (ester), amide, nitro, $-OC_{1-6}$ alkyl, $-SC_{1-8}$ alkyl, $-C_{1-8}$ alkyl, ketone, alkylamino, amino and C_{3-8} cycloalkyl; and

each C_{3-8} cycloalkenyl substituent is independently selected from the group consisting of halogen, hydroxyl, sulfonyl C_{1-8} alkyl, sulfoxide C_{1-8} alkyl, nitro, $-OC_{1-6}$ 30 alkyl, $-SC_{1-6}$ alkyl, $-C_{1-6}$ alkyl, ketone, alkylamino, amino, C_{6-10} aryl and C_{3-8} cycloalkyl; or an enantiomer, diastereomer or tautomer thereof; or a pharmaceutically acceptable salt of any of the foregoing.

In embodiment (2), there is provided a compound according to embodiment (1), wherein:

n is 0 or 1;

5 R^{10} is $-(CH_2)_nOR^{16}$, $-(CH_2)_nC(O)R^{17}$, $-(CH_2)_nS(O)_2OH$, $-(CH_2)_nNR^{18}R^{19}$, $-(CH_2)_n$
 $P(O)(OC_{1-6} \text{ alkyl})_2$, $-(CH_2)_n-P(O)(OC_{1-6} \text{ alkyl})OH$, $-(CH_2)_n-P(O)(OH)_2$ or optionally
substituted heterocycle;

R^{16} is H or $-C(O)(C_{1-8} \text{ alkyl})$;

R^{17} is OH or $-OC_{1-8} \text{ alkyl}$;

R^{18} H; and

10 R^{19} is selected from the group consisting of H, $-C(O)R^{17}$ and $-S(O)_2N(C_{1-8} \text{ alkyl})_2$;
or an enantiomer, diastereomer or tautomer thereof;
or a pharmaceutically acceptable salt of any of the foregoing.

In embodiment (3), there is provided a compound according to any one of
embodiments (1) or (2), wherein R^9 is H.

15

In embodiment (4), there is provided a compound according to any one of
embodiments (1) through (3), wherein:

R^6 is H, optionally substituted $C_{1-8} \text{ alkyl}$ or $-CH_2-C_{6-10} \text{ aryl}$, wherein said $C_{1-6} \text{ aryl}$ is
optionally substituted; and

20 R^{6a} is H;

or an enantiomer, diastereomer or tautomer thereof;

or a pharmaceutically acceptable salt of any of the foregoing.

In embodiment (5), there is provided a compound according to any one of
embodiments (1) through (4), wherein R^7 is H, methyl, ethyl, n-propyl, isopropyl, n-

25 butyl, sec-butyl, isobutyl or t-butyl;

or an enantiomer, diastereomer or tautomer thereof;

or a pharmaceutically acceptable salt of any of the foregoing.

In embodiment (6), there is provided a compound according to any one of
embodiments (1) through (5), wherein R^1 is selected from halogen, fluorinated C_{1-8}

30 alkyl and perfluorinated $C_{1-8} \text{ alkyl}$;

or an enantiomer, diastereomer or tautomer thereof;

or a pharmaceutically acceptable salt of any of the foregoing.

In embodiment (7), there is provided a compound according to any one of embodiments (1) through (6), wherein each of R^2 , R^3 , R^4 and R^5 is H;

or an enantiomer, diastereomer or tautomer thereof;

or a pharmaceutically acceptable salt of any of the foregoing.

5

In embodiment (8), there is provided a compound according to any one of embodiments (1) through (7), wherein R^{10} is an optionally substituted heterocycle, wherein the heterocycle is selected from imidazole, triazole, tetrazole, oxazole and thiazole;

10 or an enantiomer, diastereomer or tautomer thereof;

or a pharmaceutically acceptable salt of any of the foregoing.

In embodiment (9), there is provided a compound according to any one of embodiments (1) through (8), wherein:

15 n is 0 or 1;

R^1 is selected from halogen, fluorinated C_{1-8} alkyl and perfluorinated C_{1-8} alkyl;

each of R^2 , R^3 , R^4 and R^5 is H;

R^6 is H, optionally substituted C_{1-8} alkyl or $-CH_2C_{6-10}aryl$, wherein said $C_{6-10}aryl$ is optionally substituted;

20 R^{6a} is H;

R^9 is H;

R^{10} is $-(CH_2)_nOR^{16}$, $-(CH_2)_nC(O)R^{17}$, $-(CH_2)_n-S(O)_2OH$, $-(CH_2)_nNR^{18}R^{19}$, $-(CH_2)_n-P(O)(OC_{1-6}alkyl)_2$, $-(CH_2)_n-P(O)(OC_{1-6}alkyl)OH$, $-(CH_2)_n-P(O)(OH)_2$ or optionally substituted heterocycle;

25 R^{16} is H or $-C(O)(C_{1-8}alkyl)$;

R^{17} is OH or $-OC_{1-8}alkyl$;

R^{18} H; and

R^{19} is selected from the group consisting of H, $-C(O)R^{17}$ and $-S(O)_2N(C_{1-8}alkyl)_2$;
or an enantiomer, diastereomer or tautomer thereof;

30 or a pharmaceutically acceptable salt of any of the foregoing.

In embodiment (10), there is provided a compound according to any one of embodiments (1) through (9) wherein $-CH_2-C_{6-10}aryl$ is optionally substituted benzyl.

In embodiment (11), there is provided a compound according to any one of embodiments (1) through (10), wherein:

each C₁₋₈ alkyl is independently selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, isobutyl and t-butyl; and

- 5 R⁷ is H, methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, isobutyl or t-butyl;
or an enantiomer, diastereomer or tautomer thereof;
or a pharmaceutically acceptable salt of any of the foregoing.

In embodiment (12), there is provided a compound selected from the group
10 consisting of:

tert-Butyl {[[(2S)-2-[[[4-Bromophenyl]carbamoyl]oxy]-4-methyl pentanoyl]amino} acetate;

tert-Butyl {[[(2S)-4-Methyl-2-([4-(trifluoromethyl)phenyl] carbamoyl]oxy)pentanoyl]amino}acetate;

- 15 *tert*-Butyl {[[(2S)-2-[[[4-Bromophenyl]carbamoyl]oxy]-4-methylpentanoyl](methyl)amino}acetate;

(2S)-1-[(2-Hydroxyethyl)(methyl) amino]-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate;

- 20 Diethyl {[[(2S)-4-methyl-2-([4-(Trifluoromethyl)phenyl] carbamoyl]oxy)pentanoyl]amino}methyl)phosphonate;

(2S)-1-[(2-Hydroxyethyl)amino]-4-Methyl-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;

(2S)-1-[(2-Hydroxyethyl)amino]-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate;

- 25 Diethyl {[[(2S)-2-[[[4-bromophenyl]carbamoyl]oxy]-4-methylpentanoyl]amino}methyl)phosphonate;

tert-Butyl {[[(2S)-2-[[[4-Bromophenyl]carbamoyl]oxy]-4-methylpentanoyl](propyl)amino}acetate;

- 30 *tert*-Butyl {[[(2S)-2-[[[4-Bromophenyl]carbamoyl]oxy]-4-methylpentanoyl](propan-2-yl)amino}acetate;

tert-Butyl {[[(2S)-2-[[[4-Bromophenyl]carbamoyl]oxy]-4-methylpentanoyl](ethyl)amino}acetate;

tert-Butyl {Methyl[(2S)-4-methyl-2-([4-(trifluoromethyl)phenyl] carbamoyl]oxy)pentanoyl]amino}acetate;

- tert-Butyl {Ethyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetate;
 (2S)-4-Methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl (4-bromophenyl)carbamate;
 5 (2S)-4-methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;
 (2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl (4-bromophenyl)carbamate;
 (2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;
 10 2-{{[(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}ethyl acetate;
 {[(2S)-2-{{[(4-Bromophenyl) carbamoyl]oxy}-4-methylpentanoyl]amino}acetic acid;
 {[(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetic
 15 acid;
 {[(2S)-2-{{[(4-Bromophenyl) carbamoyl]oxy}-4-methylpentanoyl}[(methyl)amino]acetic acid;
 {[(2S)-2-{{[(4-Bromophenyl) carbamoyl]oxy}-4-methylpentanoyl}[(propyl)amino]acetic acid;
 20 {[(2S)-2-{{[(4-Bromophenyl) carbamoyl]oxy}-4-methylpentanoyl}[(propan-2-yl)amino]acetic acid;
 {[(2S)-2-{{[(4-Bromophenyl) carbamoyl]oxy}-4-methylpentanoyl}[(ethyl)amino]acetic acid;
 {Methyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}
 25 acetic acid;
 {Ethyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetic acid;
 (2S)-4-Methyl-1-[methyl[2-(sulfooxy)ethyl]amino]-1-oxopentan-2-yl (4-bromophenyl)carbamate;
 30 {[(2S)-4-methyl-2-{{[(4-(trifluoromethyl)phenyl]amino}carbonyl}oxy]pentanoyl]amino)methanesulfonic acid;
 tert-Butyl {[(2S)-4-methyl-2-{{[(4-(trifluoromethyl)phenyl]amino}carbonyl}oxy]pentanoyl}[(propyl)amino]acetate;

tert-Butyl (isopropyl{(2S)-4-methyl-2-[[4-(trifluoromethyl)phenyl]amino}carbonyl)oxy]pentanoyl)amino)acetate;

(1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate;

5 (1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl [4-(trifluoromethyl)phenyl]carbamate;

(1S)-1-[(2-[(tert-butoxycarbonyl)amino]ethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate;

tert-Butyl {[2-[(4-bromophenyl)amino]carbonyl]oxy}-3-phenylpropanoyl]amino}acetate;

10 (1S)-1-benzyl-2-oxo-2-[(1H-tetrazol-5-ylmethyl)amino]ethyl (4-bromophenyl)carbamate;

tert-Butyl {[2-[(4-bromophenyl)amino]carbonyl]oxy}-3-phenylpropanoyl](methyl)amino} acetate;

15 {[2-[(4-bromophenyl)amino]carbonyl]oxy}-3-phenylpropanoyl]amino}acetic acid;

(Isopropyl{(2S)-4-methyl-2-[[4-(trifluoromethyl)phenyl]amino]carbonyl)oxy]pentanoyl)amino)acetic acid;

(1S)-1-[(2-aminoethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl) carbamate;

20 {[2-[(4-bromophenyl)amino]carbonyl]oxy}-3-phenylpropanoyl] amino}acetic acid;

[2-[(4-bromophenyl)amino]carbonyl]oxy}-3-phenylpropanoyl](methyl)amino}acetic acid; and

(1S)-1-[(2-[(Dimethylamino)sulfonyl]amino)ethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate;

25

and enantiomers, diastereomers and tautomer thereof;

and salts, including pharmaceutically acceptable salts, of any of the foregoing.

In embodiment (13), there is provided a compound selected from the group consisting of:

30 (S)-tert-Butyl 2-(((4-Bromophenyl)carbamoyl)oxy)-4-methylpentanoate;

(2S)-2-[[4-Bromophenyl]carbamoyl]oxy]-4-methylpentanoic acid;

tert-Butyl (2S)-4-Methyl-2-([4-(trifluoromethyl)phenyl]carbamoyl)oxy)pentanoate;

- (2S)-4-Methyl-2-({[4-(Trifluoromethyl)phenyl]carbamoyl}oxy)pentanoic acid;
tert-Butyl (2S)-2-({[(4-bromophenyl)amino]carbonyl}oxy)-3-phenyl propanoate; and
(2S)-2-({[(4-bromophenyl)amino]carbonyl}oxy)-3-phenylpropanoic acid;
and enantiomers, diastereomers and tautomers thereof;
5 and salts of the foregoing.

In embodiment (14), there is provided a pharmaceutical composition comprising as active ingredient a therapeutically effective amount of a compound according to any one of embodiments (1) through (13), and a pharmaceutically acceptable adjuvant, diluent or carrier.

- 10 In embodiment (15), there is provided a method of treating an ocular inflammatory disease or condition in a subject in need of such treatment, the method comprising administering to the subject a pharmaceutical composition comprising a therapeutically effective amount of a compound according to any one of embodiments (1) through (13).

- 15 In embodiment (16), there is provided the method according to embodiment (15), wherein the ocular inflammatory disease or condition is selected from: uveitis, dry eye, keratitis, allergic eye disease, infectious keratitis, herpetic keratitis, corneal angiogenesis, lymphangiogenesis, retinitis, choroiditis, acute multifocal placoid pigment epitheliopathy, Behcet's disease, post-surgical corneal wound healing,
20 post-cataract surgical inflammation, wet and dry age-related macular degeneration (ARMD).

- In embodiment (17), there is provided a method of treating dermal inflammation or a dermal disease in a subject in need of such treatment, the method comprising administering to the subject a pharmaceutical composition comprising a
25 therapeutically effective amount of a compound according to any one of embodiments (1) through (13).

- In embodiment (18), there is provided the method according to embodiment (17), wherein the dermal inflammation or disease is selected from: dermal wound healing, hypertrophic scars, keloids, burns, rosacea, atopic dermatitis, acne,
30 psoriasis, seborrheic dermatitis, actinic keratoses, basal cell carcinoma, squamous cell carcinoma, melanoma, viral warts, photoaging, photodamage, melasma, post-

inflammatory hyperpigmentation, disorders of pigmentation and alopecia (scarring and non-scarring forms).

As will be evident to those skilled in the art, individual diastereoisomeric forms can be obtained by separation of mixtures thereof in conventional manner;

5 chromatographic separation may be employed.

Compound names were generated with ACDLabs version 12.5. Some of the intermediate and reagent names used in the examples were generated with software such as Chem Bio Draw Ultra version 12.0 or Auto Nom 2000 from MDL ISIS Draw 2.5 SP1.

10 In general, characterization of the compounds is performed according to the following methods. NMR spectra are recorded on a 300 or 600 MHz Varian NMR spectrometer and acquired at room temperature. Chemical shifts are given in ppm referenced either to internal TMS or to the solvent signal. Most of the compounds of Formula I were obtained as rotamers.

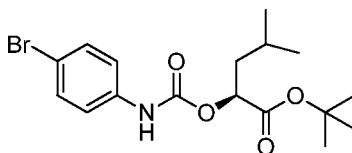
15 All the reagents, solvents, catalysts for which the synthesis is not described are purchased from chemical vendors such as Sigma Aldrich, Fluka, Bio-Blocks, Combi-blocks, TCI, VWR, Lancaster, Oakwood, Trans World Chemical, Alfa, Fisher, Maybridge, Frontier, Matrix, Ukrorgsynth, Toronto, Ryan Scientific, SiliCycle, Anaspec, Syn Chem, Chem-Impex, MIC-scientific, Ltd; however, some known
20 intermediates were prepared according to published procedures.

Usually the compounds of the invention were purified by medium pressure liquid chromatography, unless noted otherwise.

Example 1

Intermediate 1

25 **(S)-tert-Butyl 2-(((4-Bromophenyl)carbamoyl)oxy)-4-methylpentanoate**

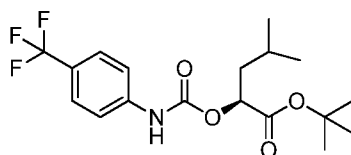


To a solution of (2S)-2-hydroxy-4-methyl-pentanoic acid, 1,1-dimethyl ethyl ester (1.10 g, 5.85 mmol) and 25 mL of methylene chloride at 25 °C was added 4-bromo-phenyl isocyanate (1.15 g, 5.85 mmol) and triethylamine (1.22 mL, 8.78 mmol). The resulting mixture was stirred at 25 °C for 4 hours. The mixture was concentrated and the residue was purified by medium pressure liquid chromatography on silica gel using ethyl acetate: hexane (8:92) to yield **Intermediate 1** as viscous oil.

^1H NMR (CD_3OD , 300MHz) δ : 7.33 - 7.47 (m, 4H), 4.87 (m, 1H), 1.56 - 1.91 (m, 1H), 1.47 (s, 9H), 0.93 - 1.04 (m, 6H).

Intermediate 2

tert-Butyl (2S)-4-Methyl-2-[[[4-(trifluoromethyl)phenyl] carbamoyl]oxy]pentanoate

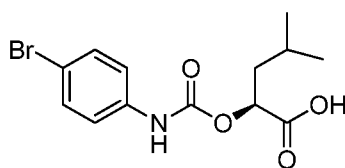


Intermediate 2 was prepared from the corresponding alpha-hydroxy carboxylic acid ester in a similar manner to the procedure described in **Example 1** for **Intermediate 1**. **Intermediate 2** was obtained as white solid; ^1H NMR (CD_3OD , 300MHz) δ : 7.52 - 7.67 (m, 4H), 4.89 (m, 1H), 1.71 - 1.92 (m, 2H), 1.58 - 1.70 (m, 1H), 1.47 (s, 9H), 0.98 (t, $J = 6.2$ Hz, 6H).

Example 2

Intermediate 3

(2S)-2-[[[4-Bromophenyl]carbamoyl]oxy]-4-methylpentanoic acid

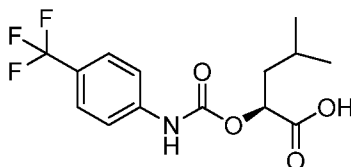


A solution of **Intermediate 1** (1.53 g, 3.98 mmol) and 20 mL of formic acid was stirred at 25 °C for 5 hours. The resulting mixture was quenched with water (20mL) then extracted with ethyl acetate. The organic layer was washed with water,

brine, dried over Na₂SO₄, filtered, and the filtrate was concentrated under reduced pressure. The residue was rinsed 4 times with methylene chloride : hexane (1:9) to yield **Intermediate 3** as white solid; ¹H NMR (CD₃OD, 300MHz) δ: 7.33 - 7.45 (m, 4H), 4.94 - 5.04 (m, 1H), 1.73 - 1.95 (m, 2H), 1.63 - 1.73 (m, 1H), 0.98 (dd, J = 6.6, 3.7 Hz, 6H).

Intermediate 4

(2S)-4-Methyl-2-[[[4-(trifluoromethyl)phenyl]-carbamoyl]oxy]pentanoic acid

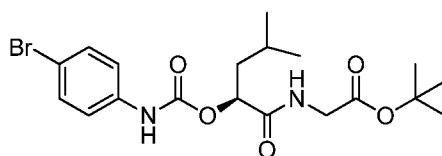


Intermediate 4 was prepared from the corresponding carbamate derivative in a similar manner to the procedure described in **Example 2** for **Intermediate 3**. **Intermediate 4** was obtained as white solid; ¹H NMR (CD₃OD, 300MHz) δ: 7.60 - 7.66 (m, 2H), 7.53 - 7.59 (m, 2H), 5.02 (dd, J = 9.2, 3.7 Hz, 1H), 1.76 - 1.91 (m, 2H), 1.66 - 1.75 (m, 1H), 0.99 (dd, J = 6.3, 3.4 Hz, 6H).

Example 3

Compound 1

tert-Butyl {[[(2S)-2-[[[4-Bromophenyl]carbamoyl]oxy]-4-methylpentanoyl]amino}acetate

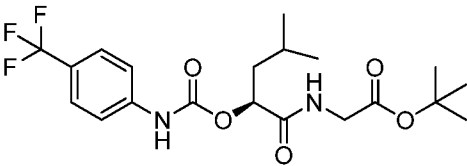
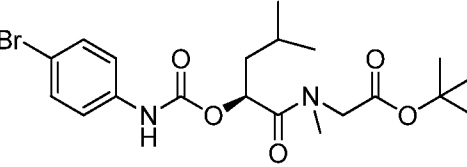


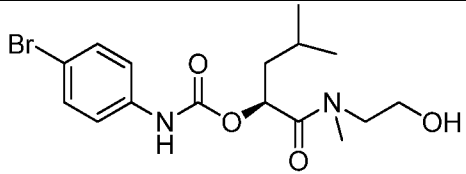
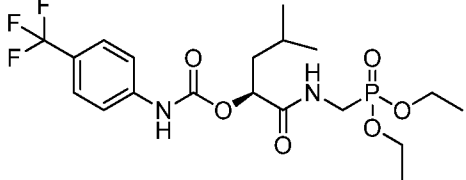
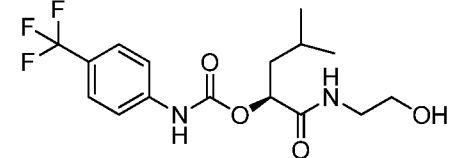
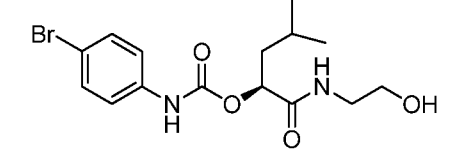
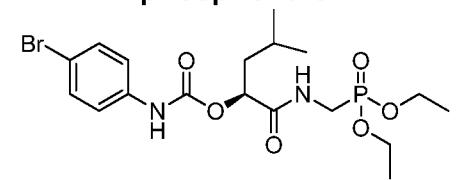
To a solution of **Intermediate 3** (300 mg, 0.911 mmol) and 12 mL of anhydrous DMF at 25 °C was added EDCI (262 mg, 1.37 mmol), HOBt (185 mg, 1.37 mmol), glycine tert-butyl ester (179 mg, 1.37 mmol), and N-methylmorpholine (184 mg, 1.82 mmol). The resulting mixture was stirred at 25 °C for 12 hours. The mixture was quenched with water (5 mL), and the product was extracted with ethyl acetate (40 mL). The layers were separated, and the organic layer was washed with water, brine, dried over Na₂SO₄, filtered, and the filtrate was concentrated under reduced pressure. The resulting product was purified by medium pressure liquid

chromatography on silica gel using ethyl acetate: hexane (1:4) to yield **Compound 1** as white solid; ^1H NMR (CD_3OD , 300MHz) δ : 7.34 - 7.46 (m, 4H), 5.10 (dd, J = 9.5, 4.0 Hz, 1H), 3.75 - 3.94 (m, 2H), 1.73 - 1.92 (m, 2H), 1.60 - 1.72 (m, 1H), 1.45 (s, 9H), 0.99 (s, 3H), 0.97 (s, 3H).

- 5 **Compounds 2, 3, 4, 5, 6, 7 and 8** were prepared from the corresponding carbamate derivative in a similar manner to the procedure described in **Example 3** for **Compound 1**. Specifically, **Compounds 3, 4, 7 and 8** were prepared from **Intermediate 3**, and compounds **2, 5 and 6** were prepared from **Intermediate 4**. **Compounds 2, 3, 4, 5, 6, 7 and 8** were obtained as white solids; their characteristics
10 are described below in **Table 1**.

Table 1

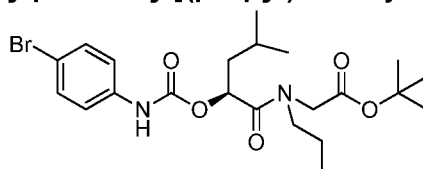
Comp. number	IUPAC name Structure	^1H NMR δ (ppm)
2	tert-Butyl {[(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyl}oxy)pentanoyl]amino} acetate 	^1H NMR (CD_3OD , 300MHz) δ : 7.61 - 7.66 (m, 2H), 7.54 - 7.60 (m, 2H), 5.12 (dd, J = 9.8, 3.7 Hz, 1H), 3.75 - 3.95 (m, 2H), 1.75 - 1.93 (m, 2H), 1.69 (dd, J = 9.5, 4.8 Hz, 1H), 1.45 (s, 9H), 1.00 (s, 3H), 0.98 (s, 3H).
3	tert-Butyl {[(2S)-2-({[4-Bromophenyl]carbamoyl}oxy)-4-methylpentanoyl](methyl)amino} acetate 	^1H NMR (CD_3OD , 300MHz) δ : 7.31 - 7.47 (m, 4H), 5.42 (d, J = 10.8 Hz, 1H), 4.19 - 4.36 (m, 1H), 3.80 (m, 1H), 3.19 (s, 3H), 1.70 - 1.97 (m, 2H), 1.52 - 1.67 (m, 1H), 1.46 (s, 9H), 1.01 (d, J = 5.9 Hz, 6H).
4	(2S)-1-[(2-Hydroxyethyl)(methyl)amino]-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate	^1H NMR (CD_3OD , 300MHz) δ : 7.98 (s, NH), 7.30 - 7.45 (m, 4H), 5.30 - 5.48 (m, 1H), 3.63 - 3.86 (m, 2H), 3.36 - 3.62 (m, 2H), 2.98 (s, 3H), 1.71 - 1.95 (m, 2H), 1.44 - 1.62 (m, 1H),

		0.94 - 1.06 (m, 6H).
5	<p>Diethyl ({[(2S)-4-methyl-2-({[4-(Trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino} methyl)phosphonate</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.50 - 7.69 (m, 4H), 5.04 - 5.15 (m, 1H), 4.04 - 4.20 (m, 4H), 3.58 - 3.87 (m, 2H), 1.72 - 1.93 (m, 2H), 1.55 - 1.69 (m, 1H), 1.22 - 1.38 (m, 6H), 1.00 (s, 3H), 0.98 (s, 3H).
6	<p>(2S)-1-[(2-Hydroxyethyl)amino]-4-Methyl-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.51 - 7.68 (m, 4H), 5.07 (dd, J = 9.4, 3.5 Hz, 1H), 3.55 - 3.66 (m, 2H), 3.32 - 3.38 (m, 2H), 1.80 (m, 2H), 1.56 - 1.70 (m, 1H), 0.99 (s, 3H), 0.97 (s, 3H).
7	<p>(2S)-1-[(2-Hydroxyethyl)amino]-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.32 - 7.46 (m, 4H), 5.05 (dd, J = 9.7, 3.5 Hz, 1H), 3.54 - 3.65 (m, 2H), 3.32 - 3.38 (m, 2H), 1.70 - 1.90 (m, 2H), 1.56 - 1.69 (m, 1H), 0.98 (s, 3H), 0.96 (s, 3H).
8	<p>Diethyl ({[(2S)-2-({[4-bromophenyl]carbamoyl}oxy)-4-methylpentanoyl]amino}methyl) phosphonate</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 8.35 (br. s., NH), 7.33 - 7.46 (m, 4H), 5.01 - 5.12 (m, 1H), 4.04 - 4.22 (m, 4H), 3.59 - 3.89 (m, 2H), 1.69 - 1.92 (m, 2H), 1.55 - 1.67 (m, 1H), 1.24 - 1.35 (m, 6H), 0.99 (s, 3H), 0.97 (s, 3H).

Example 4

Compound 9

tert-Butyl {[[(2S)-2-[[[4-Bromophenyl]carbamoyl]oxy]-4-methylpentanoyl](propyl)amino}acetate

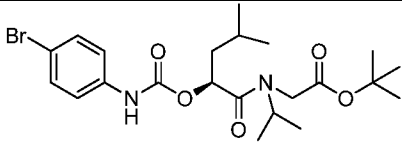
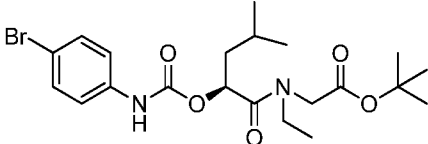
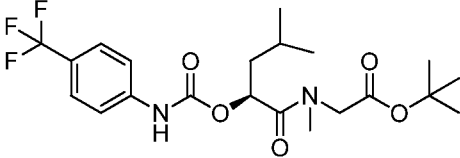
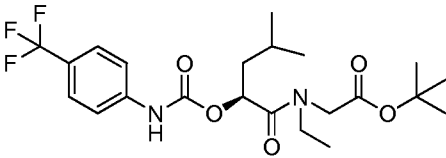
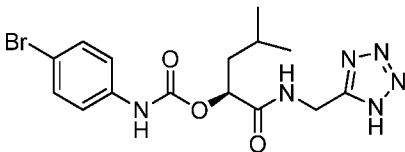


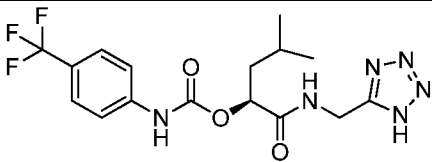
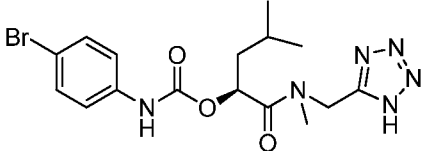
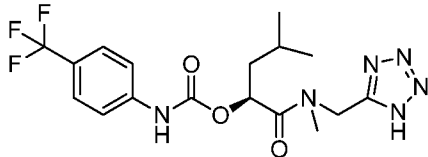
5 A solution of **Intermediate 3** (170 mg, 0.52 mmol), DCC (106 mg, 0.52 mmol) and 14 mL of anhydrous dichloromethane was stirred at 25 °C for 12 hours. The mixture was filtered. The filtrate was quenched with 10% HCl (5 mL), and the product was extracted with ethyl acetate (20 mL). The layers were separated, and the organic layer was washed with water, brine, dried over Na₂SO₄, filtered, and the
10 filtrate was concentrated under reduced pressure. The resulting product was purified by medium pressure liquid chromatography on silica gel using ethyl acetate : hexane (15:85) to yield **Compound 9** as a white solid; ¹H NMR (CD₃OD, 300MHz) δ: 7.30 - 7.47 (m, 4H), 5.39 (d, J = 11.1 Hz, 1H), 4.19 (d, J = 17.0 Hz, 1H), 3.75 (d, J = 17.0 Hz, 1H), 3.38 (t, J = 7.5 Hz, 2H), 1.66 - 1.95 (m, 3H), 1.52 - 1.64 (m, 2H), 1.44 (s,
15 9H), 0.91 - 1.07 (m, 9H).

Compounds 10, 11, 12, 13, 14, 15, 16 and 17 were prepared from the corresponding carbamate derivative in a similar manner to the procedure described in **Example 4** for **Compound 9**. Specifically, **Compounds 10, 11, 14 and 16** were prepared from **Intermediate 3**, and **Compounds 12, 13, 15 and 17** were prepared
20 from **Intermediate 4**. **Compound 10, 11, 12, 13, 14, 15, 16 and 17** were each obtained as a white solid; their characteristics are described below in **Table 2**.

Table 2

Cmpd. number	IUPAC name Structure	¹ H NMR δ (ppm)
10	tert-Butyl {[[(2S)-2-[[[4-Bromophenyl]carbamoyl]oxy]-4-methylpentanoyl](propan-2-yl)amino}acetate	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.31 - 7.44 (m, 4H), 5.46 (d, J = 9.1 Hz, 1H), 4.19 - 4.36 (m, 1H), 3.94 - 4.04 (m, 1H), 3.67 - 3.79 (m, 1H), 1.75 - 1.94 (m, 2H), 1.58 (m, 1H), 1.43 (s, 9H), 1.21 - 1.34 (m, 6H), 0.94 -

		1.05 (m, 6H).
11	<p>tert-Butyl {[(2S)-2-[[(4-Bromophenyl)carbamoyl]oxy]-4-methylpentanoyl] (ethylamino)acetate</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.38 (s, 4H), 5.39 (d, J = 10.3 Hz, 1H), 4.19 (d, J = 17.0 Hz, 1H), 3.75 (d, J = 16.7 Hz, 1H), 3.42 - 3.58 (m, 2H), 1.76 - 1.95 (m, 2H), 1.53 - 1.66 (m, 1H), 1.45 (s, 9H), 1.23 - 1.37 (m, 3H), 0.93 - 1.06 (m, 6H).
12	<p>tert-Butyl {Methyl[(2S)-4-methyl-2-[[(4-(trifluoromethyl)phenyl)carbamoyl]oxy)pentanoyl]amino}acetate</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.48 - 7.68 (m, 4H), 5.44 (d, J = 8.2 Hz, 1H), 4.31 (s, 1H), 3.79 (d, J = 17.3 Hz, 1H), 3.21 (s, 3H), 1.74 - 1.97 (m, 2H), 1.54 - 1.68 (m, 1H), 1.46 (s, 9H), 0.91 - 1.07 (m, 6H).
13	<p>tert-Butyl {Ethyl[(2S)-4-methyl-2-[[(4-(trifluoromethyl)phenyl)carbamoyl]oxy)pentanoyl]amino}acetate</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.49 - 7.69 (m, 4H), 5.43 (s, 1H), 4.56 (d, J = 18.2 Hz, 1H), 4.20 (d, J = 17.0 Hz, 1H), 3.69 - 3.85 (m, 1H), 3.42 - 3.61 (m, 2H), 1.76 - 2.01 (m, 2H), 1.53 - 1.70 (m, 1H), 1.45 (s, 9H), 1.23 - 1.37 (m, 3H), 0.95 - 1.07 (m, 6H).
14	<p>(2S)-4-Methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl (4-bromophenyl)carbamate</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.33 - 7.47 (m, 4H), 5.03 - 5.14 (m, 1H), 4.70 (s, 2H), 1.72 - 1.90 (m, 2H), 1.66 (m, 1H), 0.98 (s, 3H), 0.96 (s, 3H).
15	<p>(2S)-4-methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl [4-(trifluoromethyl)phenyl]carbamate</p>	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.98 (s, NH), 7.60 (m, 4H), 5.12 (dd, J = 9.7, 3.2 Hz, 1H), 4.70 (s, 2H), 1.81 (m, 2H), 1.57 - 1.74 (m, 1H), 0.98 (s, 3H), 0.96 (s, 3H).

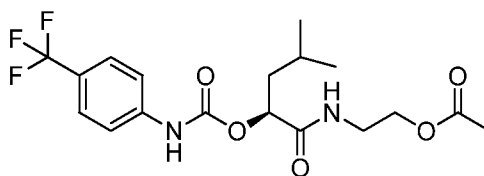
		
16	<p>(2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl (4-bromophenyl)carbamate</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.98 (s, NH), 7.29 - 7.46 (m, 4H), 5.36 (d, J = 10.3 Hz, 1H), 4.73 - 5.04 (m, 2H), 2.99 (s, 3H), 1.60 - 1.97 (m, 2H), 1.25 - 1.47 (m, 1H), 0.95 - 1.08 (m, 6H).
17	<p>(2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.98 (s, NH), 7.50 - 7.67 (m, 4H), 5.35 - 5.46 (m, 1H), 4.94 - 5.04 (m, 1H), 4.73 - 4.88 (m, 1H), 2.99 (s, 3H), 1.53 - 1.97 (m, 2H), 1.13 - 1.46 (m, 1H), 0.91 - 1.06 (m, 6H).

Example 5

Compound 18

2-[[[(2S)-4-Methyl-2-([4-(trifluoromethyl)phenyl] carbamoyl)oxy]pentanoyl]amino]ethyl acetate

5

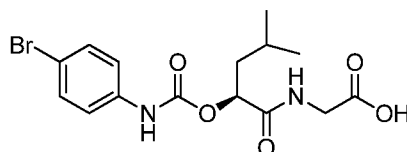


A solution of **Compound 6** (50 mg, 0.14 mmol), 4 mL of anhydrous THF and acetic anhydride (0.014 mL, 0.15 mmol) was stirred at 25 °C for 1 hour. The mixture was concentrated and the resulting product was purified by medium pressure liquid chromatography on silica gel using ethyl acetate: hexane (4:6) to yield **Compound 18** as clear oil; ¹H NMR (CD₃OD, 300MHz) δ: 7.51 - 7.70 (m, 4H), 5.04 (dd, J = 9.1, 3.3 Hz, 1H), 4.05 - 4.21 (m, 2H), 3.47 (m, 2H), 1.99 (s, 3H), 1.71 - 1.90 (m, 2H), 1.63 (m, 1H), 0.99 (s, 3H), 0.97 (s, 3H).

Example 6

Compound 19

{[(2S)-2-[(4-Bromophenyl)carbamoyloxy]-4-methylpentanoyl]amino} acetic acid

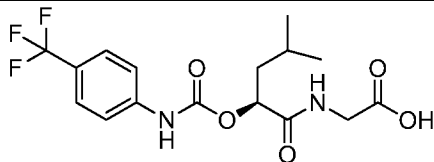
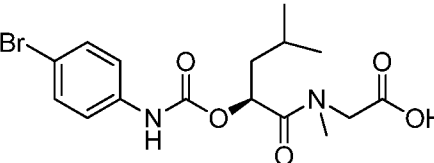
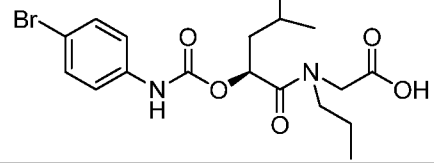
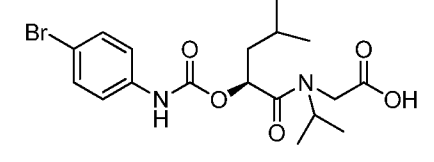
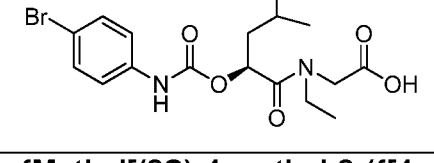
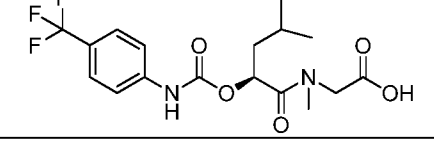


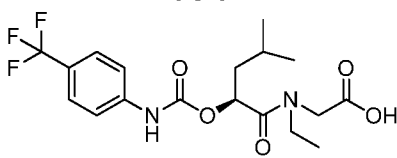
A solution of **Compound 1** (368 mg, 0.83 mmol) and 8mL of formic acid was stirred at 25 °C for 12 hours. The resulting reaction was quenched with water (10mL), and the product was extracted with EtOAc. The organic layer was washed with water, brine, dried over Na₂SO₄, filtered, and concentrated under reduced pressure. The residue was rinsed four times with acetone : hexane (1:99) to yield **Compound 19** as a white solid; ¹H NMR (CD₃OD, 300MHz) δ: 8.26 (s, 1H), 7.33 - 7.45 (m, 4H), 5.06 - 5.17 (m, 1H), 3.84 - 4.04 (m, 2H), 1.74 - 1.90 (m, 2H), 1.63 - 1.74 (m, 1H), 0.99 (s, 3H), 0.97 (s, 3H).

Compounds 20, 21, 22, 23, 24, 25 and 26 were prepared from the corresponding ester derivative in a similar manner to the procedure described in **Example 6** for **Compound 19**. Specifically, **Compound 20** was prepared from **Compound 2**; **Compound 21** was prepared from **Compound 3**; **Compound 22** was prepared from **Compound 9**; **Compound 23** was prepared from **Compound 10**; **Compound 24** was prepared from **Compound 11**; **Compound 25** was prepared from **Compound 12**; and **Compound 26** was prepared from **Compound 13**. **Compounds 20, 21, 22, 23, 24, 25 and 26** obtained as white solids; their characteristics are described below in **Table 3**.

Table 3

Cmpd No.	IUPAC name Structure	¹ H NMR δ (ppm)
20	{[(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyloxy}pentanoyl)amino}acetic acid	¹ H NMR (CD ₃ OD, 300MHz) δ: 8.31 (br. s., NH), 7.61 - 7.66 (m, 2H), 7.54 - 7.60 (m, 2H), 5.14 (dd, J = 9.7, 3.5 Hz, 1H), 3.87 - 4.02 (m, 2H), 1.76 - 1.91 (m, 2H), 1.63 - 1.75 (m, 1H), 1.00 (s, 3H), 0.98 (s, 3H).

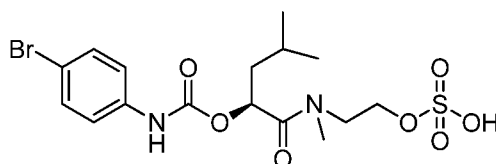
		
21	<p>{[(2S)-2-{[(4-Bromophenyl) carbamoyl]oxy}-4-methylpentanoyl](methyl)amino} acetic acid</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.28 - 7.45 (m, 4H), 5.43 (d, J = 7.6 Hz, 1H), 4.44 (m, 1H), 3.83 (d, J = 17.3 Hz, 1H), 3.21 (s, 3H), 1.72 - 1.99 (m, 2H), 1.48 - 1.68 (m, 1H), 1.02 (d, J = 1.8 Hz, 6H).
22	<p>{[(2S)-2-{[(4-Bromophenyl)carbamoyl]oxy}-4-methylpentanoyl](propyl)amino} acetic acid</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.31 - 7.47 (m, 4H), 5.39 (d, J = 10.3 Hz, 1H), 4.34 (d, J = 17.3 Hz, 1H), 3.80 (d, J = 17.3 Hz, 1H), 3.35 - 3.51 (m, 2H), 1.68 - 1.97 (m, 3H), 1.50 - 1.66 (m, 2H), 0.91 - 1.09 (m, 9H).
23	<p>{[(2S)-2-{[(4-Bromophenyl)carbamoyl]oxy}-4-methylpentanoyl](propan-2-yl)amino}acetic acid</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.30 - 7.45 (m, 4H), 5.46 (dd, J = 10.0, 3.2 Hz, 1H), 4.28 (quin, J = 6.6 Hz, 1H), 4.02 - 4.16 (m, 1H), 3.82 (d, J = 17.3 Hz, 1H), 1.72 - 1.98 (m, 2H), 1.48 - 1.65 (m, 1H), 1.20 - 1.37 (m, 6H), 0.93 - 1.03 (m, 6H).
24	<p>{[(2S)-2-{[(4-Bromophenyl) carbamoyl]oxy}-4-methylpentanoyl](ethyl)amino}acetic acid</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.38 (m, 4H), 5.40 (d, J = 10.3 Hz, 1H), 4.33 (d, J = 16.7 Hz, 1H), 3.73 (d, J = 16.4 Hz, 1H), 3.38 - 3.66 (m, 2H), 1.71 - 1.97 (m, 2H), 1.53 - 1.69 (m, 1H), 1.22 - 1.36 (m, 3H), 0.87 - 1.05 (m, 6H).
25	<p>{Methyl[(2S)-4-methyl-2-{[(4-(trifluoromethyl)phenyl)carbamoyl]oxy}pentanoyl]amino}acetic acid</p> 	¹ H NMR (CD ₃ OD, 300MHz) δ: 7.49 - 7.69 (m, 4H), 5.46 (d, J = 10.3 Hz, 1H), 4.44 (s, 1H), 3.81 (d, J = 17.3 Hz, 1H), 3.21 (s, 3H), 1.71 - 1.98 (m, 2H), 1.50 - 1.71 (m, 1H), 0.91 - 1.07 (m, 6H).

26	<p>{Ethyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl]carbonyl}oxy)pentanoyl]amino}acetic acid</p> 	<p>¹H NMR (CD₃OD, 300MHz) δ: 7.48 - 7.68 (m, 4H), 5.42 (d, J=10.84 Hz, 1H), 4.34 (d, J=17.29 Hz, 1H), 3.82 (d, J=17.29 Hz, 1H), 3.41 - 3.65 (m, 2H), 1.74 - 2.00 (m, 2H), 1.51 - 1.69 (m, 1H), 1.24 - 1.38 (m, 3H), 0.86 - 1.06 (m, 6H).</p>
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Example 7

Compound 27

(2S)-4-Methyl-1-{methyl[2-(sulfooxy)ethyl]amino}-1-oxopentan-2-yl (4-bromophenyl)carbamate

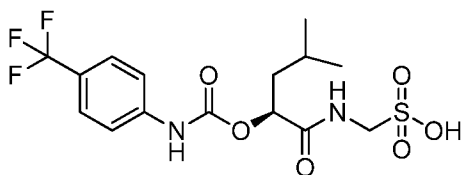


To a solution of **Compound 4** (166 mg, 0.42 mmol) and 8 mL of anhydrous THF at 25 °C under argon was added Et₃N (0.12 mL, 0.84mmol), DMAP (56 mg, 0.42 mmol), and 2,2,2-trichloroethyl chlorosulfate (205 mg, 0.84 mmol). The resulting mixture was stirred at 25 °C for 12 hours. The mixture was quenched with 10%HCl (2 mL), and the product was extracted with ethyl acetate (20 mL). The layers were separated, and the organic layer was washed with water, brine, dried over Na₂SO₄, filtered, and the filtrate was concentrated under reduced pressure. The resulting product was purified by medium pressure liquid chromatography on silica gel using methanol : dichloromethane (15:85) to yield **Compound 27** as an off white solid; ¹H NMR (CD₃OD, 300MHz) δ: 7.38 (s, 4H), 5.32 - 5.44 (m, 1H), 4.08 - 4.28 (m, 2H), 3.39 - 3.67 (m, 2H), 3.25 (s, 3H), 1.71 - 1.96 (m, 2H), 1.50 - 1.70 (m, 1H), 1.00 (d, J = 5.0 Hz, 6H).

Example 8

Compound 28

{{(2S)-4-methyl-2-([4-(trifluoromethyl)phenyl]amino)carbonyl}oxy}pentanoyl]amino)methanesulfonic acid

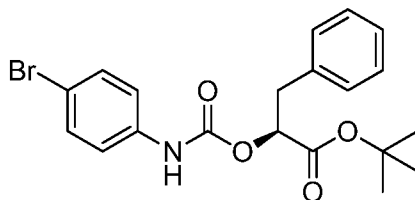


To a solution of **Intermediate 4** (750 mg, 2.35 mmol) and 10 mL of DMF at 25 °C was added aminomethane sulfonic acid (260 mg, 2.35 mmol), HATU (983 mg, 2.58 mmol) and diisopropylethylamine (0.49 mL, 2.82mmol). The resulting mixture was stirred at 100 °C for 12 hours. The mixture was concentrated and quenched with water (4 mL), and the product was extracted with ethyl acetate (20 mL). The layers were separated, and the organic layer was washed with water, brine, dried over Na₂SO₄, filtered, and the filtrate was concentrated under reduced pressure. The residue was purified by medium pressure liquid chromatography on silica gel using methanol: dichloromethane (15:85) to yield **Compound 28** as a white solid; ¹H NMR (CD₃OD, 300MHz) δ: 7.51 - 7.69 (m, 4H), 5.18 (dd, J = 9.2, 3.7 Hz, 1H), 4.22 - 4.48 (m, 2H), 1.68 - 1.91 (m, 3H), 0.99 (s, 3H), 0.98 (s, 3H).

Example 9

Intermediate 2a

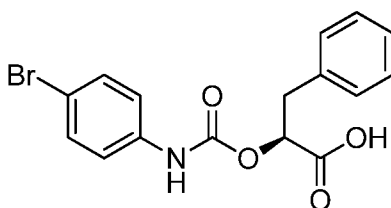
tert-Butyl (2S)-2-([(4-bromophenyl)amino]carbonyloxy)-3-phenyl propanoate



Intermediate 2a was prepared from the corresponding amino acid in a similar manner to the procedure described in **Example 1** for **Intermediate 1**. **Intermediate 2a** was obtained as clear oil; [α]_D = -13.7, (c=1.00, MeOH); ¹H NMR (CD₃OD, 300MHz) δ: 7.16-7.45 (m, 8H), 5.07 (dd, J=7.3, 5.6 Hz, 1H), 3.09-3.17 (m, 2H), 1.35-1.42 (m, 9H).

Intermediate 4a

(2S)-2-([(4-bromophenyl)amino]carbonyloxy)-3-phenylpropanoic acid



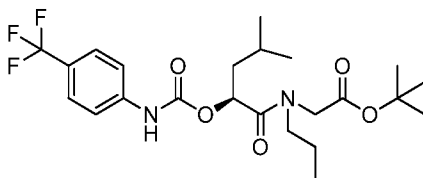
Intermediate 4a was prepared from the corresponding carbamate derivative in a similar manner to the procedure described in **Example 2** for **Intermediate 3**.

Intermediate 4a was obtained as white solid; $[\alpha]_D = -13.3$, $c=1.00$, MeOH; ^1H NMR (CD₃OD, 300MHz) δ : 7.15-7.42 (m, 8H), 5.20 (s, 1H), 3.19-3.30 (m, 1H), 3.05-3.17 (m, 1H).

Compounds 29, 30, 31, 32, 33, 34, 35 and **36** were prepared from the corresponding carbamate derivative in a similar manner to the procedure described in **Example 4** for **Compound 9**. Specifically, **Compounds 29, 30** and **32** were obtained from **Intermediate 4**; **Compounds 31** and **33** were obtained from **Intermediate 3**; and **Compounds 34, 35** and **36** were obtained from **Intermediate 4a**. The characteristics of the compounds so obtained are described below.

Compound 29

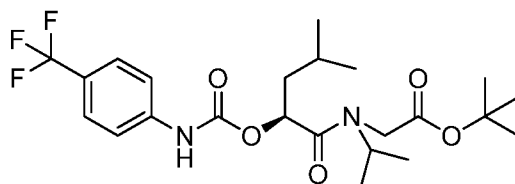
tert-Butyl [({(2S)-4-methyl-2-[[{4-(trifluoromethyl)phenyl}amino]carbonyl]oxy]pentanoyl}(propyl)amino]acetate



White solid; $[\alpha]_D = -18.6$ ($c=1.00$, MeOH); ^1H NMR (CD₃OD, 300MHz) δ : 7.49 - 7.69 (m, 4H), 5.41 (d, $J = 10.3$ Hz, 1H), 4.20 (d, $J = 17.3$ Hz, 1H), 3.76 (d, $J = 16.7$ Hz, 1H), 3.36 - 3.45 (m, 1H), 1.83 (m, 3H), 1.56 (m, 2H), 1.45 (s, 9H), 0.88 - 1.09 (m, 9H); the ^1H NMR spectrum showed the existence of rotomers.

Compound 30

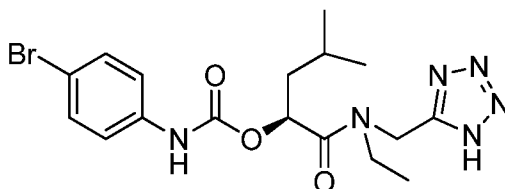
tert-Butyl (isopropyl({(2S)-4-methyl-2-[[{4-(trifluoromethyl)phenyl]amino}carbonyl]oxy]pentanoyl}amino)acetate



White solid; $[\alpha]_D = -22.3$ ($c=1.00$, MeOH); ^1H NMR (CD_3OD , 300MHz) δ : 7.51 - 7.67 (m, 4H), 5.49 (d, $J = 10.0$ Hz, 1H), 4.20 - 4.35 (m, 1H), 3.89 - 4.05 (m, 1H), 3.69 - 3.80 (m, 1H), 1.77 - 1.98 (m, 2H), 1.54 - 1.68 (m, 1H), 1.44 (s, 9H), 1.21 - 1.35 (m, 6H), 0.91 - 1.06 (m, 6H); the ^1H NMR spectrum showed the existence of rotomers.

Compound 31

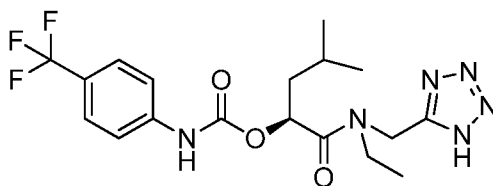
(1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate



White solid; $[\alpha]_D = -12.6$ ($c=1.00$, MeOH); ^1H NMR (CD_3OD , 300MHz) δ : 7.27 - 7.47 (m, 4H), 5.34 (m, 1H), 5.00 (d, $J = 15.8$ Hz, 1H), 4.70 (d, $J = 15.8$ Hz, 1H), 3.54 - 3.71 (m, 2H), 1.72 - 1.96 (m, 2H), 1.54 (m, 1H), 1.35 (t, $J = 7.2$ Hz, 3H), 0.90 - 1.07 (m, 6H); the ^1H NMR spectrum showed the existence of rotomers.

Compound 32

(1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl [4-(trifluoromethyl)phenyl]carbamate

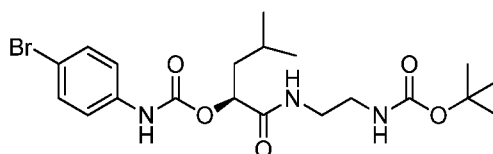


White solid; $[\alpha]_D = -9.1$ ($c=1.00$, MeOH); ^1H NMR (CD_3OD , 300MHz) δ : 7.51 - 7.69 (m, 4H), 7.43 (s, NH), 5.28 - 5.44 (m, 1H), 5.08 (d, $J = 14.9$ Hz, 1H), 4.56

- 4.69 (m, 1H), 3.48 - 3.64 (m, 1H), 1.70 - 1.98 (m, 2H), 1.58 (m, 1H), 1.23 - 1.42 (m, 3H), 0.93 - 1.07 (m, 6H); the ^1H NMR spectrum showed the existence of rotomers.

Compound 33

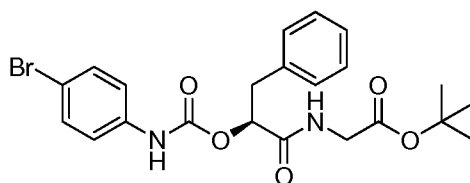
(1S)-1-[(2-[(tert-butoxycarbonyl)amino]ethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate



White solid; $[\alpha]_D = -12.4$ ($c=1.00$, MeOH); ^1H NMR (CD_3OD , 300MHz) δ : 7.40 (s, 4H), 4.94-5.06 (m, 1H), 3.24-3.31 (m, 2H), 3.17 (m, 2H), 1.79 (m, 2H), 1.55-1.69 (m, 2H), 1.40 (s, 9H), 0.97 (d, $J=6.4$ Hz, 6H).

Compound 34

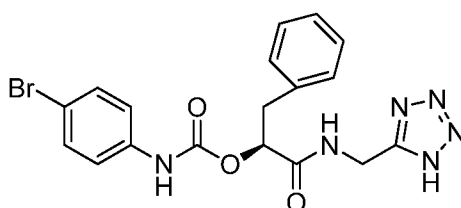
tert-Butyl [(2S)-2-([(4-bromophenyl)amino]carbonyl)oxy]-3-phenylpropanoyl]amino}acetate



White solid; $[\alpha]_D = -23.0$ ($c=1.00$, MeOH); ^1H NMR (CD_3OD , 300MHz) δ : 7.15-7.43 (m, 8H), 5.27 (s, 1H), 3.84 (d, $J=7.6$ Hz, 2H), 3.02-3.29 (m, 2H), 1.46 (s, 9H).

Compound 35

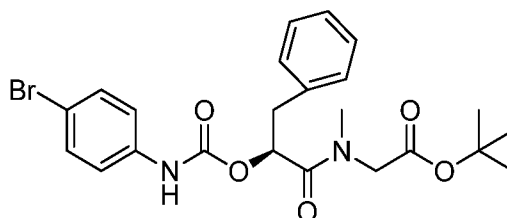
(1S)-1-benzyl-2-oxo-2-[(1H-tetrazol-5-ylmethyl)amino]ethyl (4-bromophenyl)carbamate



Off white solid; ^1H NMR (CD_3OD , 300MHz) δ : 7.18-7.41 (m, 9H), 5.22 (m, 1H), 4.66 - 4.85 (m, 2H), 3.15-3.26 (m, 2H).

Compound 36

tert-Butyl [(2S)-2-({[(4-bromophenyl)amino]carbonyl}oxy)-3-phenylpropanoyl](methyl)amino} acetate

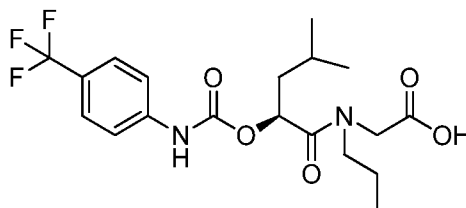


White solid; $[\alpha]_D = -18.3$ ($c=1.00$, MeOH); ^1H NMR (CD_3OD , 300MHz) δ : 7.20-7.45 (m, 9H), 5.57 (dd, $J=8.4$, 5.4 Hz, 1H), 4.02-4.15 (m, 2H), 3.18 (m, 2H), 3.16 (s, 3H), 1.40-1.53 (m, 9H).

Compounds 37, 38, 39, 40 and 41 were prepared from the corresponding ester derivative in a similar manner to the procedure described in **Example 6** for **Compound 19**. Specifically, **Compound 37** was obtained from **Compound 29**; **Compound 38** was obtained from **Compound 30**; **Compound 39** was obtained from **Compound 33**; **Compound 40** was obtained from **Compound 34**; and **Compound 41** was obtained from **Compound 36**. The characteristics of the compounds so obtained are described below.

Compound 37

[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl]amino}carbonyl}oxy)pentanoyl](propyl)amino]acetic acid

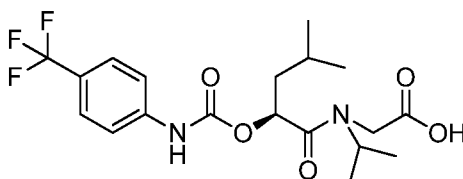


White solid; $[\alpha]_D = -10.3$ ($c=1.00$, MeOH); ^1H NMR (CD_3OD , 300MHz) δ : 7.49 - 7.68 (m, 4H), 5.42 (d, $J = 10.8$ Hz, 1H), 4.34 (d, $J = 17.3$ Hz, 1H), 3.81 (d, $J =$

17.3 Hz, 1H), 3.36 - 3.57 (m, 1H), 1.62 - 1.98 (m, 3H), 1.61 - 1.48 (m, 2H), 0.81 - 1.08 (m, 9H); the ¹H NMR spectrum showed the existence of rotomers.

Compound 38

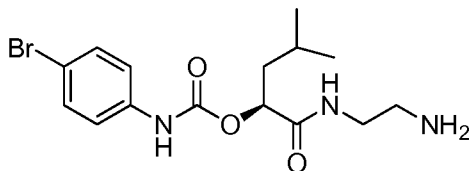
(Isopropyl{(2S)-4-methyl-2-[(4-(trifluoromethyl)phenyl)amino]carbonyloxy}pentanoyl)amino)acetic acid



White solid; [α]_D = -9.5 (c=1.00, MeOH); ¹H NMR (CD₃OD, 300MHz) δ: 7.47 - 7.68 (m, 4H), 5.50 (d, J = 9.7 Hz, 1H), 4.20 - 4.41 (m, 1H), 3.96 - 4.17 (m, 1H), 3.82 (d, J = 17.3 Hz, 1H), 1.73 - 2.03 (m, 2H), 1.61 (m, 1H), 1.29 (m, 6H), 0.83 - 1.16 (m, 6H); the ¹H NMR spectrum showed the existence of rotomers.

Compound 39

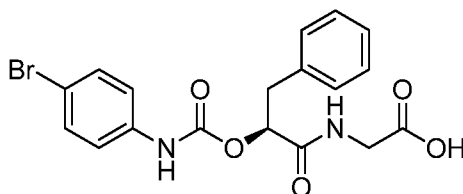
(1S)-1-[(2-aminoethyl)amino]carbonyl-3-methylbutyl (4-bromophenyl) carbamate



White solid; [α]_D = -9.8 (c=1.00, MeOH); ¹H NMR (CD₃OD, 300MHz) δ: 7.32-7.47 (m, 4H), 4.94-5.03 (m, 1H), 3.48 (m, 2H), 2.99-3.10 (m, 2H), 1.54-1.90 (m, 3H), 0.94-1.02 (m, 6H).

Compound 40

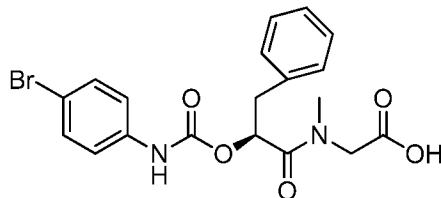
{[(2S)-2-[(4-bromophenyl)amino]carbonyloxy]-3-phenylpropanoyl}amino)acetic acid



White solid; $[\alpha]_D = -13.1$ ($c=1.00$, MeOH); ^1H NMR (CD_3OD , 300MHz) δ : 7.15-7.43 (m, 8H), 5.30 (dd, $J=8.6$, 4.2 Hz, 1H), 3.84-4.02 (m, 2H), 3.01-3.29 (m, 2H).

Compound 41

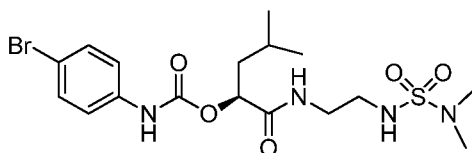
5 **[[[(2S)-2-({[(4-Bromophenyl)amino]carbonyl}oxy)-3-phenylpropanoyl] (methyl)amino}acetic acid**



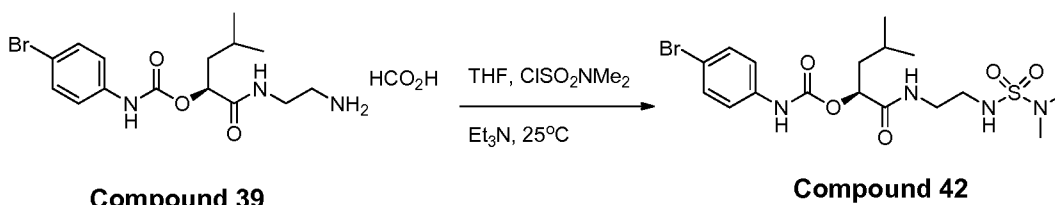
White solid; $[\alpha]_D = -16.1$ ($c=1.00$, MeOH); ^1H NMR (CD_3OD , 300MHz) δ : 7.21-7.40 (m, 9H), 5.58 (dd, $J=8.5$, 5.3 Hz, 1H), 4.28 (d, $J=17.3$ Hz, 1H), 3.91 (d, $J=17.3$ Hz, 1H), 3.03-3.21 (m, 5H).

Compound 42

(1S)-1-[[[2-({[(Dimethylamino)sulfonyl]amino}ethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate



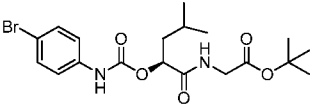
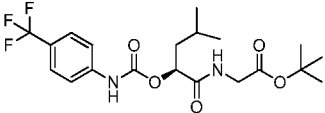
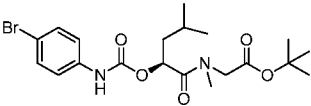
15 A solution of **Compound 39** (78 mg, 0.19 mmol) in 14 mL of anhydrous THF, N,N-dimethylsulfonyl chloride (33 mg, 0.23 mmol) and Et_3N (48 mg, 0.48 mmol) 14 mL was stirred at 25°C for 12 hours. The mixture was quenched with water (2mL), extracted with ethyl acetate (10 mL). The organic layer was washed with water, brine, dried over Na_2SO_4 , filtered, and the filtrate was concentrated under reduced pressure. The resulting product was purified by medium pressure liquid chromatography on silica gel using ethyl acetate : hexane (8:2) to yield **Compound 42** as white solid; ^1H NMR (CD_3OD , 600MHz) δ : 7.32-7.47 (m, 4H), 4.97-5.07 (m, 1H), 3.32 (m, 2H), 3.07-3.19 (m, 2H), 1.73-1.89 (m, 2H), 1.64 (m, 1H), 0.97 (d, $J=6.2$ Hz, 6H).

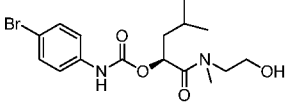
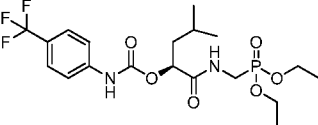
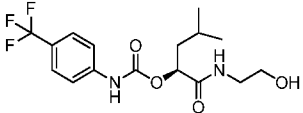
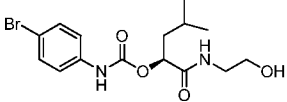
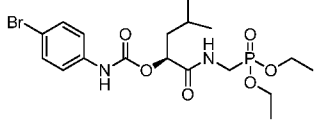
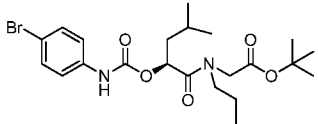
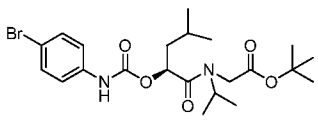
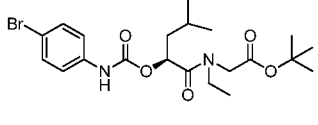


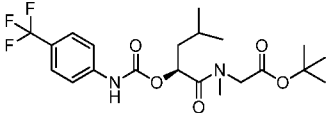
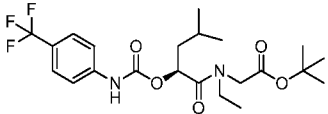
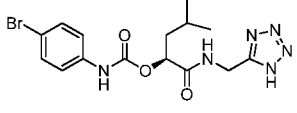
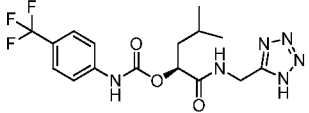
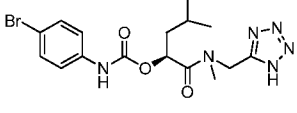
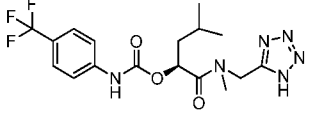
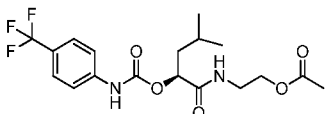
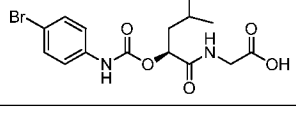
Biological Data

Biological activity of compounds according to Formula I is set forth in **Table 4** below. CHO-Gα16 cells stably expressing FPR2 were cultured in (F12, 10% FBS, 1% PSA, 400 µg/ml geneticin and 50 µg/ml hygromycin) and HEK- Gqi5 cells stable expressing FPR1 were cultured in (DMEM high glucose, 10% FBS, 1% PSA, 400 µg/ml geneticin and 50 µg/ml hygromycin). In general, the day before the experiment, 18,000 cells/well were plated in a 384-well clear bottom poly-D-lysine coated plate. The following day the screening compound-induced calcium activity was assayed on the FLIPR^{Tetra}. The drug plates were prepared in 384-well microplates using the EP3 and the MultiPROBE robotic liquid handling systems. Compounds were tested at concentrations ranging from 0.61 to 10,000 nM. Results are expressed as EC₅₀ (nM) and % efficacy values.

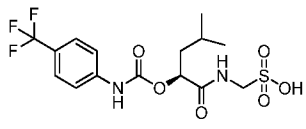
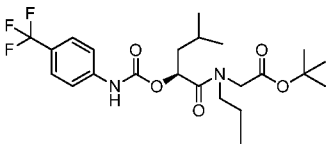
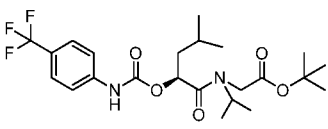
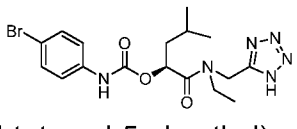
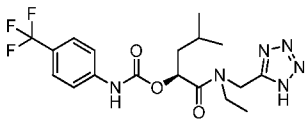
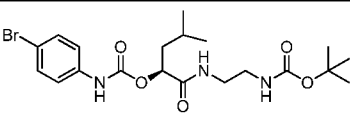
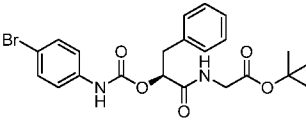
Table 4

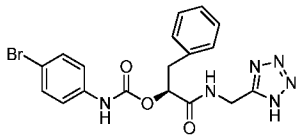
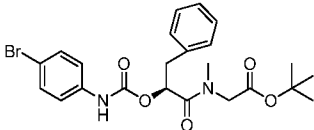
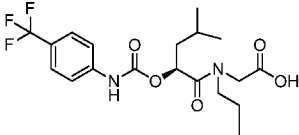
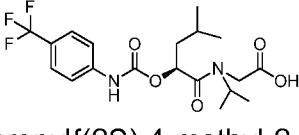
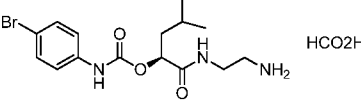
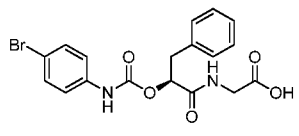
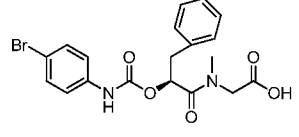
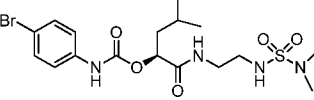
Compound No.	Structure/ IUPAC Name	FPR2 Gα16- CHO EC ₅₀ (%eff)
1	 <i>tert</i> -Butyl {[(2S)-2-[(4-Bromophenyl)carbamoyl]oxy}-4-methyl pentanoyl]amino}acetate	526 nM (0.89)
2	 <i>tert</i> -Butyl {[(2S)-4-Methyl-2-[(4-(trifluoromethyl)phenyl)carbamoyl]oxy]pentanoyl]amino}acetate	2017 nM (1.12)
3	 <i>tert</i> -Butyl {[(2S)-2-[(4-Bromophenyl)carbamoyl]oxy}-4-	109 nM (1.01)

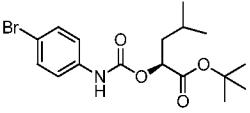
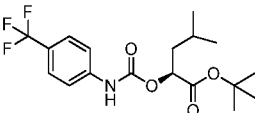
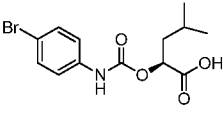
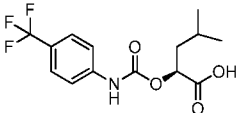
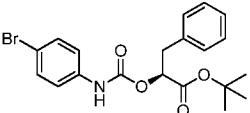
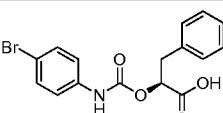
	methylpentanoyl](methyl)amino}acetate	
4	 <p>(2S)-1-[(2-Hydroxyethyl)(methyl) amino]-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate</p>	59 nM (0.97)
5	 <p>Diethyl ({[(2S)-4-methyl-2-({[4-(Trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}methyl)phosphonate</p>	6.7 nM (1.01)
6	 <p>(2S)-1-[(2-Hydroxyethyl)amino]-4-Methyl-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate</p>	146 nM (0.75)
7	 <p>(2S)-1-[(2-Hydroxyethyl)amino]-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate</p>	35 nM (0.98)
8	 <p>Diethyl ({[(2S)-2-({[4-bromophenyl]carbamoyl}oxy)-4-methylpentanoyl]amino}methyl)phosphonate</p>	1.8 nM (1.00)
9	 <p>tert-Butyl ({[(2S)-2-({[4-Bromophenyl]carbamoyl}oxy)-4-methylpentanoyl](propyl)amino}acetate</p>	4.4 nM (1.04)
10	 <p>tert-Butyl ({[(2S)-2-({[4-Bromophenyl]carbamoyl}oxy)-4-methylpentanoyl](propan-2-yl)amino}acetate</p>	11 nM (1.03)
11	 <p>tert-Butyl ({[(2S)-2-({[4-Bromophenyl]carbamoyl}oxy)-4-methylpentanoyl](propan-2-yl)amino}acetate</p>	8.0 nM (0.97)

	methylpentanoyl](ethyl)amino}acetate	
12	 <p>tert-Butyl {Methyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetate</p>	24.8 nM (1.00)
13	 <p>tert-Butyl {Ethyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetate</p>	16.6 nM (0.99)
14	 <p>(2S)-4-Methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl (4-bromophenyl)carbamate</p>	1.3 nM (1.01)
15	 <p>(2S)-4-methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl [4-(trifluoromethyl)phenyl]carbamate</p>	3.6 nM (0.96)
16	 <p>(2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl (4-bromophenyl)carbamate</p>	0.81 nM (0.98)
17	 <p>(2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate</p>	2.4 nM (0.91)
18	 <p>2-{{(2S)-4-Methyl-2-{{[4-(trifluoromethyl)phenyl] carbamoyl}oxy}pentanoyl]amino}ethyl acetate</p>	195 nM (0.89)
19	 <p>(2S)-4-methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl (4-bromophenyl)carbamate</p>	0.84 nM (1.01)

	<chem>CC(C)C(=O)N(CCC(=O)Nc1ccc(C(F)(F)F)cc1)C(=O)O</chem>	
20	<chem>CC(C)C(=O)N(CCC(=O)Nc1ccc(C(F)(F)F)cc1)C(=O)O</chem> {[(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetic acid	3.9 nM (0.99)
21	<chem>CC(C)C(=O)N(CCC(=O)Nc1ccc(Br)cc1)C(=O)O</chem> {[(2S)-2-{{[4-Bromophenyl] carbamoyl}oxy}-4-methylpentanoyl](methyl)amino}acetic acid	0.25 nM (1.06)
22	<chem>CC(C)C(=O)N(CCC(=O)Nc1ccc(Br)cc1)C(=O)O</chem> {[(2S)-2-{{[4-Bromophenyl] carbamoyl}oxy}-4-methylpentanoyl](propyl)amino}acetic acid	0.44 nM (0.91)
23	<chem>CC(C)C(=O)N(CCC(=O)Nc1ccc(Br)cc1)C(=O)O</chem> {[(2S)-2-{{[4-Bromophenyl] carbamoyl}oxy}-4-methylpentanoyl](propan-2-yl)amino}acetic acid	0.32 nM (1.05)
24	<chem>CC(C)C(=O)N(CCC(=O)Nc1ccc(Br)cc1)C(=O)O</chem> {[(2S)-2-{{[4-Bromophenyl] carbamoyl}oxy}-4-methylpentanoyl](ethyl)amino}acetic acid	0.24 nM (0.95)
25	<chem>CC(C)C(=O)N(CCC(=O)Nc1ccc(C(F)(F)F)cc1)C(=O)O</chem> {Methyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetic acid	0.94 nM (0.97)
26	<chem>CC(C)C(=O)N(CCC(=O)Nc1ccc(C(F)(F)F)cc1)C(=O)O</chem> {Ethyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetic acid	0.29 nM (0.98)
27	<chem>CC(C)C(=O)N(CCC(=O)Nc1ccc(Br)cc1)C(=O)O</chem> {[(2S)-2-{{[4-Bromophenyl] carbamoyl}oxy}-4-methylpentanoyl](2-sulphatoethyl)amino}acetic acid	8.7 nM (0.99)

	(2S)-4-Methyl-1-[methyl[2-(sulfooxy)ethyl]amino]-1-oxopentan-2-yl (4-bromophenyl)carbamate	
28	 <p>((2S)-4-methyl-2-(((4-(trifluoromethyl)phenyl)amino)carbonyl)oxy]pentanoyl)amino)methanesulfonic acid</p>	4.3 nM (0.85)
29	 <p>tert-Butyl [(2S)-4-methyl-2-(((4-(trifluoromethyl)phenyl)amino)carbonyl)oxy]pentanoyl}(propyl)amino]acetate</p>	11.4 nM (1.01)
30	 <p>tert-Butyl (isopropyl((2S)-4-methyl-2-(((4-(trifluoromethyl)phenyl)amino)carbonyl)oxy]pentanoyl)amino)acetate</p>	301 nM (0.76)
31	 <p>(1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate</p>	0.30 nM (0.95)
32	 <p>(1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl [4-(trifluoromethyl)phenyl]carbamate</p>	0.66 nM (1.00)
33	 <p>(1S)-1-[[2-[(tert-butoxycarbonyl)amino]ethyl]amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate</p>	397 nM (1.03)
34	 <p>tert-Butyl [(2S)-2-(((4-bromophenyl)amino)carbonyl)oxy]-3-phenylpropanoyl]amino]acetate</p>	106 nM (1.03)

35	 <p>(1S)-1-benzyl-2-oxo-2-[(1H-tetrazol-5-ylmethyl)amino]ethyl (4-bromophenyl)carbamate</p>	0.83 nM (1.03)
36	 <p>tert-Butyl {[2S]-2-([(4-bromophenyl)amino]carbonyl)oxy}-3-phenylpropanoyl(methyl)amino} acetate</p>	11.7 nM (1.05)
37	 <p>[(2S)-4-methyl-2-([(4-(trifluoromethyl)phenyl)amino]carbonyl)oxy]pentanoyl(propyl)amino]acetic acid</p>	1.2 nM (1.02)
38	 <p>(Isopropyl{[(2S)-4-methyl-2-([(4-(trifluoromethyl)phenyl)amino]carbonyl)oxy]pentanoyl}amino)acetic acid</p>	0.66 nM (1.07)
39	 <p>(1S)-1-[(2-aminoethyl)amino]carbonyl-3-methylbutyl (4-bromophenyl) carbamate</p>	78 nM (0.89)
40	 <p>[(2S)-2-([(4-bromophenyl)amino]carbonyl)oxy]-3-phenylpropanoyl amino}acetic acid</p>	1.3 nM (0.95)
41	 <p>[(2S)-2-([(4-Bromophenyl)amino]carbonyl)oxy]-3-phenylpropanoyl (methyl)amino}acetic acid</p>	0.41 nM (0.98)
42	 <p>(1S)-1-[(2-[(dimethylamino)sulfonyl]ethyl)amino]carbonyl-3-methylbutyl (4-bromophenyl) carbamate</p>	125 nM (0.99)

	(1S)-1-[[2- {[(Dimethylamino)sulfonyl]amino}ethyl)amino]carbonyl]-3- methylbutyl (4-bromophenyl)carbamate	
Inter- mediate 1	 (S)-tert-Butyl 2-(((4-Bromophenyl)carbamoyl)oxy)-4- methylpentanoate	Not Deter- mined
Interme- diate 2	 tert-Butyl (2S)-4-Methyl-2-[[4-(trifluoromethyl)phenyl] carbamoyl]oxy]pentanoate	10000 nM (0.56)
Interme- diate 3	 (2S)-2-[[4-(4-Bromophenyl)carbamoyl]oxy]-4- methylpentanoic acid	8.6 nM (0.85)
Interme- diate 4	 (2S)-4-Methyl-2-[[4-(trifluoromethyl)phenyl] carbamoyl]oxy]pentanoic acid	24.7 nM (0.88)
Interme- diate 2a	 tert-Butyl (2S)-2-([4-(4-bromophenyl)amino]carbonyl)oxy]-3- phenyl propanoate	2195 nM (0.55)
Interme- diate 4a	 (2S)-2-([4-(4-bromophenyl)amino]carbonyl)oxy]-3- phenylpropanoic acid	1.43 nM (1.03)

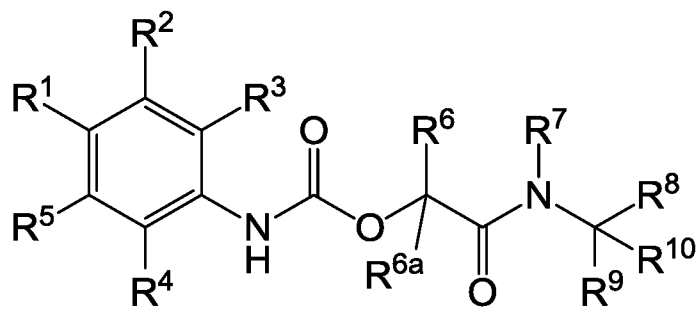
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Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

The reference in this specification to any prior publication (or information derived from it), or to any matter which is known, is not, and should not be taken as an acknowledgment or admission or any form of suggestion that that prior publication (or information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

The claims defining the invention are as follows:

1. A compound represented by Formula I:



Formula I

wherein:

R^1 is optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$, $-C(O)R^{14}$ or $-OR^{15}$;

R^2 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$ $-C(O)R^{14}$ or $-OR^{15}$;

R^3 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$ $-C(O)R^{14}$ or $-OR^{15}$;

R^4 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$ $-C(O)R^{14}$ or $-OR^{15}$;

R^5 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, halogen, $NR^{11}R^{12}$, fluorinated C_{1-8} alkyl, perfluorinated C_{1-8} alkyl, $-S(O)_mR^{13}$ $-C(O)R^{14}$ or $-OR^{15}$;

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R^6 is H, optionally substituted C_{1-8} alkyl, optionally substituted heterocycle, $-(CH_2)_pCOOH$, $-(CH_2)_pNH_2$, $-(CH_2)_pOH$, $-(CH_2)_pSH$, $-(CH_2)_pCONH_2$, $-(CH_2)_pCONH_2$, $-CH(OH)CH_3$, $-(CH_2)_pSCH_3$, $-(CH_2)_pNH-C(=NH)(NH_2)$ or $-CH_2C_{6-10}aryl$, wherein said $-C_{6-10}aryl$ is optionally substituted;

R^{6a} is H or optionally substituted C_{1-8} alkyl;

R^7 is H or optionally substituted C_{1-8} alkyl;

R^8 is H;

R^9 is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl or optionally substituted C_{3-8} cycloalkenyl;

R^{10} is $-(CH_2)_nOR^{16}$, $-(CH_2)_nS(O)_2OH$, $-(CH_2)_nC(O)R^{17}$, $-(CH_2)_nOS(O)_2OH$, $-(CH_2)_nNR^{18}R^{19}$, $-(CH_2)_nP(O)(OC_{1-6}alkyl)_2$, $-(CH_2)_nP(O)(OC_{1-6}alkyl)OH$, $-(CH_2)_nP(O)(OH)_2$ or optionally substituted heterocycle;

R^{11} is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl or optionally substituted C_{3-8} cycloalkenyl;

R^{12} is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl or optionally substituted C_{3-8} cycloalkenyl;

R^{13} is H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, OH or optionally substituted C_{3-8} cycloalkenyl;

R^{14} is optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl or $-OR^{15}$;

R^{15} is H or optionally substituted C_{1-8} alkyl;

R^{16} is H, $-C(O)(C_{1-8}alkyl)$ or optionally substituted C_{1-8} alkyl;

R^{17} is OH, $-OC_{1-8}alkyl$ or $C_{1-8}alkyl$;

R^{18} is selected from the group consisting of H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, optionally substituted C_{3-8} cycloalkenyl, $-C(O)R^{17}$ and $-S(O)_2N(C_{1-8}alkyl)_2$;

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R^{19} is selected from the group consisting of H, optionally substituted C_{1-8} alkyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted heterocycle, optionally substituted C_{6-10} aryl, or optionally substituted C_{3-8} cycloalkenyl, $-C(O)R^{17}$ and $-S(O)_2N(C_{1-8} \text{ alkyl})_2$;

p is 1, 2 or 3;

n is 0, 1, 2, 3, 4, 5, 6, 7 or 8; and

m is 0, 1 or 2;

wherein

each C_{1-8} alkyl substituent is independently selected from the group consisting of halogen, hydroxyl, $-OC_{1-8}$ alkyl, C_{3-8} cycloalkyl, amino, heterocycle, C_{6-10} aryl, carboxylic acid, phosphonic acid, sulphonic acid, phosphoric acid, nitro, amide, sulfonamide, carboxylate ester and ketone;

each C_{3-8} cycloalkyl substituent is independently selected from the group consisting of halogen, hydroxyl, sulfonyl C_{1-8} alkyl, sulfoxide C_{1-8} alkyl, sulfonamide, nitro, $-OC_{1-8}$ alkyl, $-SC_{1-8}$ alkyl groups, $-C_{1-8}$ alkyl, ketone, alkylamino, amino, C_{6-10} aryl and C_{3-8} cycloalkyl;

each heterocycle substituent is independently selected from the group consisting of halogen, hydroxyl, $-OC_{1-8}$ alkyl, sulfonyl C_{1-8} alkyl, sulfoxide C_{1-8} alkyl, nitro, $-SC_{1-8}$ alkyl, $-C_{1-8}$ alkyl, ketone, alkylamino, amino, C_{6-10} aryl and C_{3-8} cycloalkyl;

each C_{6-10} aryl substituent is independently selected from the group consisting of halogen, hydroxyl, sulfonyl C_{1-8} alkyl, sulfoxide C_{1-8} alkyl, sulfonamide, carboxylic acid, C_{1-8} alkyl carboxylate (ester), amide, nitro, $-OC_{1-6}$ alkyl, $-SC_{1-8}$ alkyl, $-C_{1-8}$ alkyl, ketone, alkylamino, amino and C_{3-8} cycloalkyl; and

each C_{3-8} cycloalkenyl substituent is independently selected from the group consisting of halogen, hydroxyl, sulfonyl C_{1-8} alkyl, sulfoxide C_{1-8} alkyl, nitro, $-OC_{1-6}$ alkyl, $-SC_{1-6}$ alkyl, $-C_{1-6}$ alkyl, ketone, alkylamino, amino, C_{6-10} aryl and C_{3-8} cycloalkyl;

or an enantiomer, diastereomer or tautomer thereof;

or a pharmaceutically acceptable salt of any of the foregoing.

2. A compound according to claim 1, wherein:

R^1 is selected from halogen, fluorinated C_{1-8} alkyl and perfluorinated C_{1-8} alkyl.

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3. A compound according to claim 1 or 2, wherein:

each of R^2 , R^3 , R^4 and R^5 is H.

4. A compound according to any one of claims 1 to 3, wherein:

R^6 is H, optionally substituted C_{1-8} alkyl or $-CH_2C_{6-10}$ aryl, wherein said C_{1-6} aryl is optionally substituted;

R^{6a} is H; and

R^7 is H, methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, isobutyl or t-butyl.

5. A compound according to any one of claims 1 to 4, wherein:

n is 0 or 1;

R^9 is H;

R^{10} is $-(CH_2)_nOR^{16}$, $-(CH_2)_nC(O)R^{17}$, $-(CH_2)_nS(O)_2OH$, $-(CH_2)_nNR^{18}R^{19}$, $-(CH_2)_n-P(O)(OC_{1-6} \text{ alkyl})_2$, $-(CH_2)_n-P(O)(OC_{1-6}alkyl)OH$, $-(CH_2)_n-P(O)(OH)_2$ or optionally substituted heterocycle;

R^{16} is H or $-C(O)(C_{1-8} \text{ alkyl})$;

R^{17} is OH or $-OC_{1-8} \text{ alkyl}$;

R^{18} is H; and

R^{19} is selected from the group consisting of H, $-C(O)R^{17}$ and $-S(O)_2N(C_{1-8} \text{ alkyl})_2$.

6. A compound according to claim 1, wherein:

R^1 is selected from halogen, fluorinated C_{1-8} alkyl and perfluorinated C_{1-8} alkyl;

each of R^2 , R^3 , R^4 and R^5 is H;

R^6 is H, optionally substituted C_{1-8} alkyl or $-CH_2C_{6-10}$ aryl, wherein said C_{6-10} aryl is optionally substituted;

R^{6a} is H;

R^9 is H;

R^{10} is $-(CH_2)_nOR^{16}$, $-(CH_2)_nC(O)R^{17}$, $-(CH_2)_n-S(O)_2OH$, $-(CH_2)_nNR^{18}R^{19}$, $-(CH_2)_n-P(O)(OC_{1-6} \text{ alkyl})_2$, $-(CH_2)_n-P(O)(OC_{1-6}alkyl)OH$, $-(CH_2)_n-P(O)(OH)_2$ or optionally substituted heterocycle;

R^{16} is H or $-C(O)(C_{1-8} \text{ alkyl})$;

R^{17} is OH or $-OC_{1-8} \text{ alkyl}$;

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R¹⁸ is H; and

R¹⁹ is selected from the group consisting of H, -C(O)R¹⁷ and -S(O)₂N(C₁₋₈ alkyl)₂.

7. A compound according to claim 6, wherein:

each C₁₋₈ alkyl is independently selected from the group consisting of methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, isobutyl and t-butyl; and

R⁷ is H, methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, isobutyl or t-butyl.

8. A compound according to claim 1, selected from the group consisting of:

tert-Butyl {[(2S)-2-[[(4-Bromophenyl)carbamoyl]oxy]-4-methyl pentanoyl]amino} acetate;

tert-Butyl {[(2S)-4-Methyl-2-([4-(trifluoromethyl)phenyl] carbamoyl)oxy)pentanoyl]amino}acetate;

tert-Butyl {[(2S)-2-[[(4-Bromophenyl)carbamoyl]oxy]-4-methylpentanoyl](methyl)amino}acetate;

(2S)-1-[(2-Hydroxyethyl)(methyl) amino]-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate;

Diethyl ([(2S)-4-methyl-2-([4-(Trifluoromethyl)phenyl] carbamoyl)oxy)pentanoyl]amino)methyl)phosphonate;

(2S)-1-[(2-Hydroxyethyl)amino]-4-Methyl-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;

(2S)-1-[(2-Hydroxyethyl)amino]-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate;

Diethyl ([(2S)-2-[[(4-bromophenyl)carbamoyl]oxy]-4-methylpentanoyl]amino)methyl)phosphonate;

tert-Butyl {[(2S)-2-[[(4-Bromophenyl)carbamoyl]oxy]-4-methylpentanoyl](propyl)amino}acetate;

tert-Butyl {[(2S)-2-[[(4-Bromophenyl)carbamoyl]oxy]-4-methylpentanoyl](propan-2-yl)amino}acetate;

tert-Butyl {[(2S)-2-[[(4-Bromophenyl)carbamoyl]oxy]-4-methylpentanoyl](ethyl)amino}acetate;

tert-Butyl {Methyl[(2S)-4-methyl-2-([4-(trifluoromethyl)phenyl] carbamoyl)oxy)pentanoyl]amino}acetate;

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tert-Butyl {Ethyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetate;

(2S)-4-Methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl (4-bromophenyl)carbamate;

(2S)-4-methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;

(2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl (4-bromophenyl)carbamate;

(2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;

2-{{(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyl}oxy)pentanoyl]amino}ethyl acetate;

{{(2S)-2-{{(4-Bromophenyl)carbamoyl}oxy}-4-methylpentanoyl]amino}acetic acid;

{{(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetic acid;

{{(2S)-2-{{(4-Bromophenyl) carbamoyl}oxy}-4-methylpentanoyl}(methyl)amino}acetic acid;

{{(2S)-2-{{(4-Bromophenyl)carbamoyl}oxy}-4-methylpentanoyl}(propyl)amino}acetic acid;

{{(2S)-2-{{(4-Bromophenyl)carbamoyl}oxy}-4-methylpentanoyl}(propan-2-yl)amino}acetic acid;

{{(2S)-2-{{(4-Bromophenyl) carbamoyl}oxy}-4-methylpentanoyl}(ethyl)amino}acetic acid;

{Methyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyl}oxy)pentanoyl]amino} acetic acid;

{Ethyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyl}oxy)pentanoyl]amino} acetic acid;

(2S)-4-Methyl-1-{methyl[2-(sulfooxy)ethyl]amino}-1-oxopentan-2-yl (4-bromophenyl) carbamate;

{{(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl]amino}carbonyl)oxy}pentanoyl]amino)methanesulfonic acid;

tert-Butyl [{(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl]amino}carbonyl)oxy}pentanoyl](propyl)amino]acetate;

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tert-Butyl (isopropyl{(2S)-4-methyl-2-([4-(trifluoromethyl)phenyl] amino)carbonyl)oxy]pentanoyl)amino)acetate;
 (1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate;
 (1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl [4-(trifluoromethyl)phenyl]carbamate;
 (1S)-1-[[2-[(tert-butoxycarbonyl)amino]ethyl]amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate;
 tert-Butyl {[2-(2-[(4-bromophenyl)amino]carbonyl)oxy]-3-phenylpropanoyl]amino}acetate;
 (1S)-1-benzyl-2-oxo-2-[(1H-tetrazol-5-ylmethyl)amino]ethyl (4-bromophenyl)carbamate;
 tert-Butyl {[2-(2-[(4-bromophenyl)amino]carbonyl)oxy]-3-phenylpropanoyl](methyl)amino} acetate;
 {[2-(2-[(4-bromophenyl)amino]carbonyl)oxy]-3-phenylpropanoyl] amino}acetic acid;
 (Isopropyl{(2S)-4-methyl-2-([4-(trifluoromethyl)phenyl]amino)carbonyl)oxy]pentanoyl)amino)acetic acid;
 (1S)-1-[[2-[(2-aminoethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate;
 {[2-(2-[(4-bromophenyl)amino]carbonyl)oxy]-3-phenylpropanoyl] amino}acetic acid;
 {[2-(2-[(4-Bromophenyl)amino]carbonyl)oxy]-3-phenylpropanoyl] (methyl)amino}acetic acid; and
 (1S)-1-[[2-[(Dimethylamino)sulfonyl]amino]ethyl]amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate.

9. A compound selected from the group consisting of:

(S)-tert-Butyl 2-(((4-Bromophenyl)carbamoxy)oxy)-4-methylpentanoate;
 (2S)-2-[[4-Bromophenyl]carbamoxy]oxy-4-methylpentanoic acid;
 tert-Butyl (2S)-4-Methyl-2-([4-(trifluoromethyl)phenyl]carbamoxy)oxy)pentanoate;
 (2S)-4-Methyl-2-([4-(Trifluoromethyl)phenyl]carbamoxy)oxy)pentanoic acid;
 tert-Butyl (2S)-2-([4-bromophenyl]amino]carbonyl)oxy-3-phenyl propanoate; and

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(2S)-2-([[(4-bromophenyl)amino]carbonyl]oxy)-3-phenylpropanoic acid;
and enantiomers, diastereomers and tautomers thereof;
and salts of the foregoing.

10. A pharmaceutical composition comprising as active ingredient a therapeutically effective amount of a compound according to any one of claims 1 to 9 and a pharmaceutically acceptable adjuvant, diluent or carrier.

11. A pharmaceutical composition according to claim 10, wherein the compound is selected from the group consisting of:

tert-Butyl {[[(2S)-2-[[[(4-Bromophenyl)carbamoyl]oxy]-4-methyl pentanoyl]amino} acetate;

tert-Butyl {[[(2S)-4-Methyl-2-([[(4-(trifluoromethyl)phenyl] carbamoyl]oxy)pentanoyl]amino}acetate;

tert-Butyl {[[(2S)-2-[[[(4-Bromophenyl)carbamoyl]oxy]-4-methylpentanoyl](methyl)amino}acetate;

(2S)-1-[(2-Hydroxyethyl)(methyl) amino]-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate;

Diethyl ([[(2S)-4-methyl-2-([[(4-(Trifluoromethyl)phenyl] carbamoyl]oxy)pentanoyl]amino}methyl)phosphonate;

(2S)-1-[(2-Hydroxyethyl)amino]-4-Methyl-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;

(2S)-1-[(2-Hydroxyethyl)amino]-4-methyl-1-oxopentan-2-yl (4-bromophenyl)carbamate;

Diethyl ([[(2S)-2-[[[(4-bromophenyl)carbamoyl]oxy]-4-methylpentanoyl]amino}methyl)phosphonate;

tert-Butyl {[[(2S)-2-[[[(4-Bromophenyl)carbamoyl]oxy]-4-methylpentanoyl](propyl)amino}acetate;

tert-Butyl {[[(2S)-2-[[[(4-Bromophenyl)carbamoyl]oxy]-4-methylpentanoyl](propan-2-yl)amino}acetate;

tert-Butyl {[[(2S)-2-[[[(4-Bromophenyl)carbamoyl]oxy]-4-methylpentanoyl](ethyl)amino}acetate;

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tert-Butyl {Methyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetate;

tert-Butyl {Ethyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetate;

(2S)-4-Methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl (4-bromophenyl)carbamate;

(2S)-4-methyl-1-oxo-1-[(1H-tetrazol-5-ylmethyl)amino]pentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;

(2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl (4-bromophenyl)carbamate;

(2S)-4-methyl-1-[methyl(1H-tetrazol-5-ylmethyl)amino]-1-oxopentan-2-yl [4-(trifluoromethyl)phenyl]carbamate;

2-[(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyl}oxy)pentanoyl]amino}ethyl acetate;

{[(2S)-2-[(4-Bromophenyl)carbamoyl]oxy}-4-methylpentanoyl]amino}acetic acid;

{[(2S)-4-Methyl-2-({[4-(trifluoromethyl)phenyl] carbamoyl}oxy)pentanoyl]amino}acetic acid;

{[(2S)-2-[(4-Bromophenyl) carbamoyl]oxy}-4-methylpentanoyl](methyl)amino}acetic acid;

{[(2S)-2-[(4-Bromophenyl)carbamoyl]oxy}-4-methylpentanoyl](propyl)amino}acetic acid;

{[(2S)-2-[(4-Bromophenyl)carbamoyl]oxy}-4-methylpentanoyl](propan-2-yl)amino}acetic acid;

{[(2S)-2-[(4-Bromophenyl) carbamoyl]oxy}-4-methylpentanoyl](ethyl)amino}acetic acid;

{Methyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyl}oxy)pentanoyl]amino} acetic acid;

{Ethyl[(2S)-4-methyl-2-({[4-(trifluoromethyl)phenyl]carbamoyl}oxy)pentanoyl]amino} acetic acid;

(2S)-4-Methyl-1-{methyl[2-(sulfooxy)ethyl]amino}-1-oxopentan-2-yl (4-bromophenyl) carbamate;

(({2S)-4-methyl-2-[(4-(trifluoromethyl)phenyl]amino}carbonyl)oxy)pentanoyl]amino)methanesulfonic acid;

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tert-Butyl [{(2S)-4-methyl-2-[[[4-(trifluoromethyl)phenyl]amino]carbonyl}oxy]pentanoyl}(propyl)amino]acetate;

tert-Butyl (isopropyl){(2S)-4-methyl-2-[[[4-(trifluoromethyl)phenyl]amino]carbonyl}oxy]pentanoyl}amino]acetate;

(1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate;

(1S)-1-[[ethyl(1H-tetrazol-5-ylmethyl)amino]carbonyl]-3-methylbutyl [4-(trifluoromethyl)phenyl]carbamate;

(1S)-1-[[{2-[(tert-butoxycarbonyl)amino]ethyl}amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate;

tert-Butyl [{(2S)-2-[[[4-bromophenyl]amino]carbonyl}oxy)-3-phenylpropanoyl]amino}acetate;

(1S)-1-benzyl-2-oxo-2-[(1H-tetrazol-5-ylmethyl)amino]ethyl (4-bromophenyl)carbamate;

tert-Butyl [{(2S)-2-[[[4-bromophenyl]amino]carbonyl}oxy)-3-phenylpropanoyl](methyl)amino} acetate;

[[{2S)-4-methyl-2-[[[4-(trifluoromethyl)phenyl]amino]carbonyl}oxy]pentanoyl}(propyl)amino]acetic acid;

(Isopropyl){(2S)-4-methyl-2-[[[4-(trifluoromethyl)phenyl]amino]carbonyl}oxy]pentanoyl}amino]acetic acid;

(1S)-1-[[{2-aminoethyl}amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate;

[[{2S)-2-[[[4-bromophenyl]amino]carbonyl}oxy)-3-phenylpropanoyl] amino}acetic acid;

[[{2S)-2-[[[4-Bromophenyl]amino]carbonyl}oxy)-3-phenylpropanoyl](methyl)amino}acetic acid; and

(1S)-1-[[{2-[(Dimethylamino)sulfonyl]amino}ethyl}amino]carbonyl]-3-methylbutyl (4-bromophenyl)carbamate.

12. A method of treating an ocular inflammatory disease or condition in a subject in need of such treatment, the method comprising administering to the subject a pharmaceutical composition comprising a therapeutically effective amount of a

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compound according to any one of claims 1 to 9, wherein the ocular inflammatory disease or condition is alleviated by the modulation of FPR2.

13. The method of claim 12, wherein the ocular inflammatory disease or condition is selected from the group consisting of: uveitis, dry eye, keratitis, allergic eye disease, infectious keratitis, herpetic keratitis, corneal angiogenesis, lymphangiogenesis, retinitis, choroiditis, acute multifocal placoid pigment epitheliopathy, Behcet' s disease, post-surgical corneal wound healing, post-cataract surgical inflammation, wet and dry age-related macular degeneration (ARMD).

14. A method of treating dermal inflammation or a dermal disease in a subject in need of such treatment, the method comprising administering to the subject a pharmaceutical composition comprising a therapeutically effective amount of a compound according to any one of claims 1 to 9, wherein the dermal inflammation or dermal disease is alleviated by the modulation of FPR2.

15. The method of claim 14, wherein the dermal inflammation or dermal disease is selected from the group consisting of: dermal wound healing, hypertrophic scars, keloids, burns, rosacea, atopic dermatitis, acne, psoriasis, seborrheic dermatitis, actinic keratoses, basal cell carcinoma, squamous cell carcinoma, melanoma, viral warts, photoaging, photodamage, melasma, post-inflammatory hyperpigmentation, disorders of pigmentation and alopecia (scarring and non-scarring forms).

16. Use of a compound according to any one of claims 1 to 9 in the manufacture of a medicament for treating an ocular inflammatory disease or condition, wherein the ocular inflammatory disease or condition is alleviated by the modulation of FPR2.

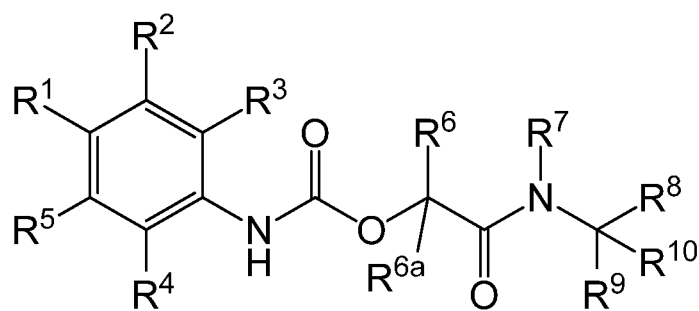
17. Use according to claim 16, wherein the ocular inflammatory disease or condition is selected from the group consisting of: uveitis, dry eye, keratitis, allergic eye disease, infectious keratitis, herpetic keratitis, corneal angiogenesis, lymphangiogenesis, retinitis, choroiditis, acute multifocal placoid pigment

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epitheliopathy, Behcet' s disease, post-surgical corneal wound healing, post-cataract surgical inflammation, wet and dry age-related macular degeneration (ARMD).

18. Use of a compound according to any one of claims 1 to 9 in the manufacture of a medicament for treating dermal inflammation or a dermal disease, wherein the dermal inflammation or dermal disease is alleviated by the modulation of FPR2.

19. Use according to claim 18, wherein the dermal inflammation or dermal disease is selected from the group consisting of: dermal wound healing, hypertrophic scars, keloids, burns, rosacea, atopic dermatitis, acne, psoriasis, seborrheic dermatitis, actinic keratoses, basal cell carcinoma, squamous cell carcinoma, melanoma, viral warts, photoaging, photodamage, melasma, post-inflammatory hyperpigmentation, disorders of pigmentation and alopecia (scarring and non-scarring forms).



Formula I

FIG. 1