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ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: NOVEL HUMAN, FELINE, CHICKEN AND OTHER ANIMAL INTERFERONS AND USES THEREOF

(57) Abstract: The invention relates to novel interferon polypeptides and nucleic from humans, felines, chicken and other species and to related compositions and uses. The invention also provides novel interleukin polypeptides and nucleic acids, as well as nucleic acids and polypeptides for interferons and interleukin receptors. The invention also provides antibodies specific for the novel polypeptides, assays for identifying modulators of interferon activity, and methods of treating animals, including humans, afflicted with various disorders and conditions by administering interferon polypeptides, including IFN-P polypeptides and fragments.



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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/009229

A. CLASSIFICATION OF SUBJECT MATTER

INV. C12N15/20 C12N15/24 C12N15/63 C12N5/10 C07K16/24
 C07K16/28 C12Q1/68 G01N33/53 A61K31/713 A61K38/20
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C12N C07K C12Q G01N A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, Sequence Search, WPI Data, EMBASE, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE Geneseq [Online] 2 December 2004 (2004-12-02), "Human interferon (IFN) alpha 4 protein." XP002400035 retrieved from EBI accession no. GSP:ADS16313 Database accession no. ADS16313 & US 2004/175359 A1 (DESJARLAIS JOHN RUDOLPH ET AL) 9 September 2004 (2004-09-09) ----- -/---	1-7, 10-12, 14,15, 43-48, 50-55, 57-59, 62-75,88

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

25 September 2006

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European Patent Office, P.B. 5818 Patentlaan 2
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EPO Proteins [Online] 27 January 2003 (2003-01-27), "Sequence 50 from Patent WO0236627." XP002400034 retrieved from EBI accession no. EPOP:AX592888 Database accession no. AX592888 abstract & WO 02/36627 A (PBL BIOMEDICAL LABORATORIES; PESTKA, SIDNEY) 10 May 2002 (2002-05-10) sequence 50	1-7, 10-12, 14,15, 43-48, 50-55, 57-59, 62-75,88
L	VILCEK J ET AL: "Historical review: Cytokines as therapeutics and targets of therapeutics" TRENDS IN PHARMACOLOGICAL SCIENCES, ELSEVIER, AMSTERDAM, NL, vol. 25, no. 4, April 2004 (2004-04), pages 201-209, XP004500540 ISSN: 0165-6147	
L	LILES W C ET AL: "REVIEW: NOMENCLATURE AND BIOLOGIC SIGNIFICANCE OF CYTOKINES INVOLVED IN INFLAMMATION AND THE HOST IMMUNE RESPONSE" JOURNAL OF INFECTIOUS DISEASES, CHICAGO, IL, US, vol. 172, no. 6, December 1995 (1995-12), pages 1573-1580, XP001057722 ISSN: 0022-1899	
L	DATABASE Geneseq [Online] 21 May 2002 (2002-05-21), "Human protein NOV2." XP002400036 retrieved from EBI accession no. GSP:AAU85404 Database accession no. AAU85404	
L	DATABASE UniProt [Online] 1 March 2002 (2002-03-01), "Interleukin 10 receptor 2 precursor" XP002400037 retrieved from EBI Database accession no. Q8VHM7 abstract	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/009229

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 57-59, and 62-75 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-15, 43-55, 57-59, 62-75, 88 (all partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

A Rhesus monkey interferon- α 30 polypeptide (IFN- α 30) defined by amino acid sequence SEQ ID NO:1; a nucleic acid encoding said polypeptide defined by SEQ ID NO:2; an expression vector comprising said nucleic acid; a host cell comprising said expression vector; a method of producing said polypeptide; an antibody directed against said polypeptide; a pharmaceutical composition comprising either said polypeptide, or said nucleic acid or said antibody; and, a method of treating a mammal using said composition.

2. claims: 1-88 (all partially)

A human interferon- ν polypeptide (IFN- ν) defined by amino acid sequences SEQ ID NOs:3, 5, 65, 67, 69 and 71; nucleic acids encoding said polypeptides defined by SEQ ID NOs 4, 6, 68, 70; an expression vector comprising said nucleic acid; a host cell comprising said expression vector; a method of producing said polypeptide; an antibody directed against said polypeptide; a pharmaceutical composition comprising either said polypeptide, or said nucleic acid or said antibody; a method of treating a mammal using said composition; a pharmaceutical composition comprising said polypeptide and either a type I or type II interferon; a vaccine comprising said polypeptide and an antigen; a method of identifying a compound which modulates said polypeptide; a method of detecting the level of said polypeptide in a mammal; and, a method of detecting the level of said nucleic acid in a mammal.

3. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

Porcine interferon- δ (IFN- δ) having a polypeptide sequence defined by SEQ ID NOs: 7, 9, 11, 13 and 15 and encoded by a nucleic acid sequence defined by SEQ ID NOs: 8, 10, 12, 14 and 16; an expression vector comprising said nucleic acid; a host cell comprising said expression vector; a method of producing said polypeptide; an antibody directed against said polypeptide; a pharmaceutical composition comprising either said polypeptide, or said nucleic acid or said antibody; and, a method of treating a mammal using said composition.

4. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Porcine, feline or bovine interferon-alpha-omegas (IFN-alpha-omega) having a polypeptide sequence defined by SEQ ID NOs: 17, 19, 21 and 23 and encoded by a nucleic acid sequence defined by SEQ ID NOs: 18, 20, 22, and 24; an expression vector comprising said nucleic acid; a host cell comprising said expression vector; a method of producing said polypeptide; an antibody directed against said polypeptide; a pharmaceutical composition comprising either said polypeptide, or said nucleic acid or said antibody; and, a method of treating a mammal using said composition.

5. claims: 1-88 (all partially)

Idem as invention 2 but where said interferon is a feline interferon-nu polypeptide (IFN-nu) defined by SEQ ID NOs: 25, 61, and 63 and encoded by a nucleic acid defined by SEQ ID NO:26, 62 and 64.

6. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

A platypus interferon betal (IFN-betal) having a polypeptide sequence defined by SEQ ID NO: 27 and encoded by a nucleic acid sequence defined by SEQ ID NO: 28; an expression vector comprising said nucleic acid; a host cell comprising said expression vector; a method of producing said polypeptide; an antibody directed against said polypeptide; a pharmaceutical composition comprising either said polypeptide, or said nucleic acid or said antibody; and, a method of treating a mammal using said composition.

7. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

A chicken interferon III (IFN III) having a polypeptide sequence defined by SEQ ID NO: 29 and encoded by a nucleic acid sequence defined by SEQ ID NO: 30; an expression vector comprising said nucleic acid; a host cell comprising said expression vector; a method of producing said polypeptide; an antibody directed against said polypeptide; a pharmaceutical composition comprising either said polypeptide, or said nucleic acid or said antibody; and, a method of treating a mammal using said composition.

8. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Xenopus interleukin 20 (IL-20) having a polypeptide sequence defined by SEQ ID NO: 31 and encoded by a nucleic acid sequence defined by SEQ ID NO: 32; an expression vector comprising said nucleic acid; a host cell comprising said expression vector; a method of producing said polypeptide; an antibody directed against said polypeptide; a pharmaceutical composition comprising either said polypeptide, or said nucleic acid or said antibody; and, a method of treating a mammal using said composition.

9. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

Idem as invention 8 but where the interleukin is Xenopus interleukin 24 (IL-24) having a polypeptide sequence defined by SEQ ID NO: 33 and encoded by a nucleic acid sequence defined by SEQ ID NO: 34.

10. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

Idem as invention 8 but where the interleukins are Xenopus interleukin 28.1 and 28.3 (IL-28.1 and IL-28.3) having a polypeptide sequence defined by SEQ ID NO: 35 and 37 and encoded by a nucleic acid sequence defined by SEQ ID NO: 36 and 38.

11. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

Xenopus interferon-gamma receptors (IFN-gammaR2-1 and R2-2) having a polypeptide sequence defined by SEQ ID NO: 39 and 41 and encoded by a nucleic acid sequence defined by SEQ ID NO: 40 and 42, respectively; an expression vector comprising said nucleic acid; a host cell comprising said expression vector; a method of producing said polypeptide; an antibody directed against said polypeptide; a pharmaceutical composition comprising either said polypeptide, or said nucleic acid or said antibody; and, a method of treating a mammal using said composition.

12. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

A Tetraodon interleukin-20 receptor (IL-20R2) having a polypeptide sequence defined by SEQ ID NO: 43 and encoded by a nucleic acid sequence defined by SEQ ID NO: 44; an expression vector comprising said nucleic acid; a host cell comprising said expression vector; a method of producing said polypeptide; an antibody directed against said polypeptide; a pharmaceutical composition comprising either said polypeptide, or said nucleic acid or said antibody; and, a method of treating a mammal using said composition.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

13. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

Idem as invention 11 but where the interferon receptor is a *Xenopus* interferon-alpha receptor (IFN-alphaR1) having a polypeptide sequence defined by SEQ ID NO: 45 and encoded by a nucleic acid sequence defined by SEQ ID NO: 46.

14. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

A *Ciona intestinalis* cytokine receptor 1 (CRFBR1) having a polypeptide sequence defined by SEQ ID NO: 47 and encoded by a nucleic acid sequence defined by SEQ ID NO: 48; an expression vector comprising said nucleic acid; a host cell comprising said expression vector; a method of producing said polypeptide; an antibody directed against said polypeptide; a pharmaceutical composition comprising either said polypeptide, or said nucleic acid or said antibody; and, a method of treating a mammal using said composition.

15. claims: 1-15, 43-55, 57-59, 62-75, 88 (all partially)

idem as invention 14 where the receptor is a *Ciona intestinalis* cytokine receptor 2 (CRFBR2) having a polypeptide sequence defined by SEQ ID NO: 49 and encoded by a nucleic acid sequence defined by SEQ ID NO: 50.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/009229

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004175359	A1	09-09-2004	NONE
WO 0236627	A	10-05-2002	AU 2888602 A 15-05-2002
			CA 2427850 A1 10-05-2002
			EP 1355939 A2 29-10-2003
			JP 2004537964 T 24-12-2004