

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
27 February 2003 (27.02.2003)

PCT

(10) International Publication Number
WO 2003/016477 A3

(51) International Patent Classification:

C07K 14/705 (2006.01) G01N 33/554 (2006.01)
C12N 15/12 (2006.01) G01N 33/566 (2006.01)

(21) International Application Number:

PCT/US2002/025869

(22) International Filing Date: 14 August 2002 (14.08.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/312,319 14 August 2001 (14.08.2001) US

(71) Applicant (for all designated States except US): SENTI-
GEN CORP. [US/US]; 3960 Broadway, New York, NY
10036 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): LEE, Kevin, J.
[US/US]; 15 West 104th Street, Apt. 3B, New York, NY
10025 (US). NGUYEN, Thuy-Ai, T. [US/US]; 1800 El
Paseo, Apt. 1308, Houston, TX 77504 (US). KLOSS,Brian [US/US]; 182 East 95th Street, Apt. 29C, New
York, NY 10128 (US).(74) Agents: POISSANT, Brian, M. et al.; Pennie & Edmonds
LLP, 1155 Avenue of the Americas, New York, NY 10036
(US).(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG,
SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
VN, YU, ZA, ZM, ZW.(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ,
TM), European patent (AT, BE, BG, CH, CY, CZ, DE,
DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT,
SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: INSECT OR83B ODORANT RECEPTOR

1 GGACGAGCT GGTCCGGAA AGCCTCATAT CTCGTATCTT AAGTATCCC
CCGTGCTCGA CCAAGGCCCTT TCGAGTATA GAGCATAGAA TTTCATAGGG

51 GGTAAAGCTT TAAAGAGTGA AATGATTGCC TAGACGATTG CTGCATTACT
CCAATTCCGA ATTCTCACT TTACTAACGG ATCTGGCTAAC GACGTAATGA

101 GGCACTCAAT TAACCCAAGT GTACCAAGACA ACAATTACAT TGTATTCTTT
CCGTGAGTTA ATTGGTTCA CATGGTCTGT TGTTAATGTA AACATAAATA

+3 N T I S H Q P S K V Y T

151 AAGTTCAT AGCAAGGATG ACAACCTCGA TGCAGCCGAG CAGATACAG
TTTCAAGTTA TGTCTCTACT TGTGGAGCT ACGTCGGCTC GTTCATGTGC

+3 G L V A D L M P R I R A H K Y S G

201 GGCTGGTGG CCGACCTGAT GCCCAACATC CGGGCGATGA AGTACTCCGG
CCGACCCAGC GGCTGGACTA CCGGTGTAG GCCCGCTACT TCATAGGGCC

+3 G L F H N H F T G G S A F M K K V Y T

251 CCTGTTTCA CACAATTCA CCGGCGGAG TGCCTCATG AAGAAGGTGT
GGACAAGTAC GTGTGAAGT GCCCGCCCTC ACGGAATGAC TTCTCCACA

+3 Y S S V H L V F L L H Q F T F T L

301 ACTCTCCGT GCACCTGGT TTCTCTCTA TGCAGTTAC CTTCATCCGT
TGAGGAGGCA CGTGGACCA AAGGAGGAGT ACGTCAAGTG GAAGTAGGAC

+3 V N H A L N A E E V N E L S G N T

351 GTCAACATGG CCTGGAAGC CGAGGAGTGC AACAGCTGT CGGGCAACAC
CAGTTGTACC GGGACTTGG GCTCCTCCAG TTGCTGACA GCCCGTTGTG

+3 T I T T L F F T H C I T K F I Y T A

401 GATCAGGACC CTCTCTCTA CCACTGCTA CACGAAGTTT ATCTACTCTG
CTAGTCTGG GAGAAGAAGT GGGTACGTA GTGCTTCAA TAGATGGACC

+3 A V N Q K N F Y R T L N I W N Q V

451 CTGTTAACA GAAGAATTC TACAGAACAT TGAATATAT GAACAGGTG
GACAATTGGT CTCTTAAG ATGTCTTGT ACTATATATC TTGGTCCAC

+3 N T H P L F A E S D A R Y H S I A

501 AACACGCATC CCTTGTTCG CAGTCCGAT GCTCGTTACC ATTGATCGC
TTGTGCTAG GGAACAAGCG GCTCAGCCTA CGAGCAATGG TAAGCTAGCG

+3 A L A K H R K L F F L V H L T I V A

551 ACTGGCGAAG ATGAGGAAGC TGTCTTTCT GGTGATGCTG ACCACAGTGC
TGACCGCTTC TACTCTTGG ACAAGAAAGA CCACTACGAC TGGTGTGAGC

+3 A S A T A W T T I F F G D S V X

601 CCTCGGACAC CGCTGGACC ACGATCACCT TCTTGGCGA CAGCGTAAAT
GGAGCCGGTG CGGACCTGG TGTAGTGGTA AGAAACCGCT GTCGCAITTT

+3 M V V U K E T N S S I P V E I P R

651 ATGGTGGTGG ACCATGAGC GAATCCAGC ATCCCGGTGG AGATACCCCG
TACCACACC TGGTACTCTG CTTGAGGTGG TAGGGCCACC TCTATGGGGC

+3 R L P I K S F Y P W N A S H G H F Y

701 GCTGCGGATT AAGTCTCTT ACCCGTGGAA CGCCAGCCAC GGCATGTCT
CGACGGCTAA TTAGGAAGA TGGCACCTT GCGTCCGGT CCGTACAAGA

+3 Y H I S F A F Q I Y Y V L F S M I

751 ACATGATCAG CTTTGGCTTT CAGATCTACT ACGTGTCTTT CTCGATGATC
TGTAATAGT GAAACGGAAA GTCTAGATGA TGCACGAGAA GAGCTACTAG

+3 H S N L C D V M F C S W L I F A C

801 CACTCAATC TATGCGAGT GATGTTCTGC TCTTGGCTGA TATTGCGCTG
GTGAGGTAG ATACGTGCA CTACAGAGC AGAACCGACT ATAAGCGGAC

(57) Abstract: The present invention relates to insect odorant receptor genes and methods for identifying odorant receptor genes. The invention provides nucleotide sequences of insect odorant receptor genes Or83b, amino acid sequences of their encoded proteins (including peptides or polypeptides), and related products and methods. The nucleic acids of the invention may be operatively linked to promoter sequences and transformed into host cells. Methods of production of an Or83b odorant receptor protein (e.g., by recombinant means), and derivatives and analogs thereof, are provided. Antibodies to an Or83b odorant receptor protein, and derivatives thereof, are provided. Methods for identifying molecules that bind or modulate the activity of these Or83b odorant receptor genes are provided. Molecules found to bind or modulate the activity of Or83b genes may be formulated into pest control agents by providing a carrier. In a preferred embodiment, molecules that bind or modulate the activity of an Or83b gene form one species but not others is desired. Methods to modify the insect behaviour by modifying an insect Or83b odorant are also provided.



Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(88) Date of publication of the international search report:

30 November 2006

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/25869

A. CLASSIFICATION OF SUBJECT MATTER

IPC: C07K 14/705(2006.01);C12N 15/12(2006.01);G01N 33/554(2006.01),33/566(2006.01)

USPC: 435/7.21,69.1,252.3,320.1;530/350;536/23.5

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)

U.S. : 435/7.21, 69.1, 252.3, 320.1; 530/350; 536/23.5

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 practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PITTS et al. A Highly Conserved Candidate Chemoreceptor Expressed in Both Olfactory and Gustatory Tissues in the Marlarla Vector Anopheles gambiae, P.N.A.S. 06 April 2004., Vol. 101, No. 14, pages 5058-5063, see entire document.	1-58, 62-65, 69, 73-76, 80, 84-87, 91, 95-98
A	JONES et al. Functional Conservation of an Insect Odorant Receptor Gene Across 250 Million Years of Evolution, Current Biology, 22 February 2005, Vol. 15, No. 4, pages R119-R121, see entire document.	1-58, 62-65, 69, 73-76, 80, 84-87, 91, 95-98
A	VOSSHALL et al. A Spacial Map of Olfactory Receptor Expression in the Drosophila Antenna, Cell, 05 March 1999, Vol. 96, pages 725-736, see entire document.	1-58, 62-65, 69, 73-76, 80, 84-87, 91, 95-98

☐ 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	"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
"E" earlier application or patent published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

28 August 2006 (28.08.2006)

Date of mailing of the international search report

18 SEP 2006

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner of Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Authorized officer

John D. Ulm

Telephone No. (571) 272-1600

Facsimile No. (571) 273-3201

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/25869

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

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

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claim Nos.: 59-61,66-68,70-72,77-79,81-83,88-90,92-94 and 99-105
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:
Please See Continuation Sheet
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

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

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.:

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

PCT/US02/25869

Continuation of Box I Reason 2:

Claims 59 to 61, 66 to 68, 70 to 72, 77 to 79, 81 to 83, 88 to 90, 92 to 94 and 99 to 105 were not examined because they are drawn to a chemical compound that is defined exclusively by a recited activity, where no chemical name or structure is provided for even a single example of the claimed compound.

Continuation of B. FIELDS SEARCHED Item 3:

Geneseq, Issued Patents, Published Applications, PIR79, UniProt;
for SEQ ID NO:12
searched WEST, Medline for: "or83b", "dor83b"