

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To: JAMES J. KELLEY  
ELI LILLY AND COMPANY  
P. O. BOX 6288  
INDIANAPOLIS, IN 46206-6288

Date of mailing  
(day/month/year)

18 JUN 2015

Applicant's or agent's file reference  
X20141

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

PCT/US2015/020383

International filing date (day/month/year)

13 March 2015

Priority date (day/month/year)

21 March 2014

International Patent Classification (IPC) or both national classification and IPC

IPC(8) - C07K 16/24 (2015.01)

CPC - C07K 16/244 (2015.04)

Applicant  
ELI LILLY AND COMPANY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US  
Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450, Alexandria, Virginia 22313-1450  
Facsimile No. 571-273-8300

Date of completion of this opinion

14 May 2015

Authorized officer:

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300  
PCT OSP: 571-272-7774

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Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:



the international application in the language in which it was filed.



a translation of the international application into \_\_\_\_\_ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

a. (means)



on paper



in electronic form

b. (time)



in the international application as filed



together with the international application in electronic form



subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

SEQ ID NOs:1-17 were searched.

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**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 4, 11, 13-24

because:

☐ the said international application, or the said claims Nos. \_\_\_\_\_ relate to the following subject matter which does not require an international search (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 4, 11, 13-24 are so unclear that no meaningful opinion could be formed (*specify*):

Claims 4, 11, and 13-24 are multiple dependent claims not drafted in accordance with the second and third sentences of Rule 6.4(a).

☐ the claims, or said claims Nos. \_\_\_\_\_ are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):

☒ no international search report has been established for said claims Nos. 4, 11, 13-24

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit

☐ furnish a sequence listing on paper complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.

☐ furnish a sequence listing in electronic form complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.

☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13ter.1(a) or (b).

☐ See Supplemental Box for further details.

**WRITTEN OPINION OF THE  
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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

|                               |        |               |     |
|-------------------------------|--------|---------------|-----|
| Novelty (N)                   | Claims | 1-3, 5-10, 12 | YES |
|                               | Claims | None          | NO  |
| Inventive step (IS)           | Claims | 1-3, 5-10, 12 | YES |
|                               | Claims | None          | NO  |
| Industrial applicability (IA) | Claims | 1-3, 5-10, 12 | YES |
|                               | Claims | None          | NO  |

**2. Citations and explanations:**

Claims 1-3, 5-10, and 12 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest:

As to claim 1, the prior art of record, individually or in combination, does not teach or fairly suggest an antibody that binds to human IL-21 comprising a heavy chain variable region (HCVR) and a light chain variable region (LCVR) wherein the LCVR comprises SEQ.ID. NO:7 at CDRL1, SEQ. ID.NO:8 at CDRL2 and SEQ.ID.NO:9 at CDRL3 and wherein the HCVR comprises SEQ.ID. NO: 10 at CDRH1, SEQ. ID.NO: 11 at CDRH2 and SEQ.ID.NO:12 at CDRH3.

Claims 2 and 3 depend either directly or indirectly from claim 1 and therefore meet the criteria set out in PCT Article 33(2)-(3) for at least the same reasons as claim 1.

As to claim 5, the prior art of record, individually or in combination, does not teach or fairly suggest a DNA molecule comprising a polynucleotide that encodes the antibody heavy chain whose amino acid sequence is the sequence of SEQ ID NO: 3.

Claim 6 depends directly from claim 5 and therefore meets the criteria set out in PCT Article 33(2)-(3) for at least the same reasons as claim 5.

As to claim 7, the prior art of record, individually or in combination, does not teach or fairly suggest a DNA molecule comprising a polynucleotide that encodes the antibody light chain whose amino acid sequence is the sequence of SEQ ID NO: 4.

Claim 8 depends directly from claim 7 and therefore meets the criteria set out in PCT Article 33(2)-(3) for at least the same reasons as claim 7.

As to claim 9, the prior art of record, individually or in combination, does not teach or fairly suggest a DNA molecule comprising a polynucleotide that encodes the antibody heavy chain whose amino acid sequence is the sequence of SEQ ID NO: 3 and comprising a polynucleotide that encodes the antibody light chain whose amino acid sequence is the sequence of SEQ ID NO: 4.

Claims 10 and 12 depend either directly or indirectly from claim 9 and therefore meet the criteria set out in PCT Article 33(2)-(3) for at least the same reasons as claim 9.

The following prior art is made of record to support and further define the reasons claims 1-3, 5-10, and 12 meet the criteria set out in PCT Article 33(2)-(3):

(i) Sivakumar et al. discloses an antibody that binds to human IL-21 comprising a heavy chain variable region (HCVR) and a light chain variable region (LCVR) (an antibody that immunospecifically binds to an IL-21 polypeptide, Col. 5, Lns. 62 and 63; the samples plate was then set up with... human IL-21 plus 30 µL of... anti-IL-21 neutralizing antibody, Col. 36, Lns. 10-13; as used herein, the term "immunoglobulin" refers to a protein consisting of one or more polypeptides substantially encoded by immunoglobulin genes. One form of immunoglobulin constitutes the basic structural unit of an antibody. This form is a tetramer and consists of two identical pairs of immunoglobulin chains, each pair having one light and one heavy chain. In each pair, the light and heavy chain variable regions are together responsible for binding to an antigen, Col. 5 Ln. 64 – Col 6 Ln. 4), but fails to explicitly disclose wherein the LCVR comprises SEQ.ID. NO: 7 at CDRL1, SEQ. ID.NO: 8 at CDRL2 and SEQ.ID.NO: 9 at CDRL3 and wherein the HCVR comprises SEQ.ID. NO: 10 at CDRH1, SEQ. ID.NO: 11 at CDRH2 and SEQ.ID.NO:12 at CDRH3.

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**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

(ii) Bondensgaard et al. discloses a DNA molecule comprising a polynucleotide that encodes the antibody heavy chain (in a preferred embodiment, the nucleic acid molecule is a DNA molecule, such as a double-stranded DNA molecule or a cDNA molecule, Col. 11, Lns. 52 and 53; in an aspect the invention provides an isolated antibody selected from the group consisting of... a heavy chain consisting of amino acid sequence SEQ ID NO: 49, Col. 20 Ln. 64 – Col. 21 Ln. 4; a further object of the present invention is therefore an isolated nucleic acid molecule encoding any of the antibodies here above or below described, or a complementary strand or degenerate sequence thereof, Col. 11, Lns. 44-47) whose amino acid sequence comprises a sequence that has a 94.1% sequence identity match to SEQ ID NO: 3 ((SEQ ID NO: 49 of Bondensgaard et al. has a 94.1% sequence identity match to SEQ ID NO: 3 of the instant application.)), but fails to explicitly disclose wherein amino acid sequence is the sequence of SEQ ID NO: 3.

Claims 1-3, 5-10, and 12 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.