Abstract:

Title: SEQUENCES ASSOCIATED WITH TDP-43 PROTEINOPATHIES AND METHODS OF USING THE SAME

Nucleic acids and peptides and methods of using thereof to identify subjects at risk for a TDP-43 proteinopathy are disclosed. An array is also disclosed which contains the nucleic acids and peptides.
INTERNATIONAL SEARCH REPORT

A CLASSIFICATION OF SUBJECT MATTER
IPC(8) - C12Q 1/68, C12P 19/34 (2009.01)
USPC - 435/6, 435/7.1
According to International Patent Classification (IPC) or to both national classification and IPC

* FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - C12Q 1/68, C12P 19/34 (2009.01)
USPC - 435/6, 435/7.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC 530/350, 530/388 21
Amer J of Pathology, Vol 171, No 1

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WEST (PGPB, USPT, EPAB, JPAB) proteopathy, amyotrophic lateral sclerosis, xsk, ALS, TDP-43, FTD, DNA binding protein, alzheimer, TAR, array, address, epitope, nucleic acid, MND
esp@cenet Washington, cairns, baloh, TDP-43, Google Scholar TDP-43, MND, FTLD-U, proteopathy

C DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>US 2006/0134663 A1 (HARKIN et al) 22 June 2006 (22 06 2006), abstracts, para [0018], [0044], [0179], SEQ ID NO 29843</td>
<td>7-10</td>
</tr>
<tr>
<td>A</td>
<td>CAIRNS et al TDP-43 in Familial and Sporadic Frontotemporal Lobar Degeneration with Ubiquitin Inclusions Amer J of Pathology, July 2007, Vol 171, No 1, pages 227 - 240, especially page 227, abstract, page 228, left column, first paragraph, pg 228, right column, second paragraph</td>
<td>7-10</td>
</tr>
<tr>
<td>A</td>
<td>US 2003/0148360 A1 (GUIRE et al) 7 August 2003 (07 08 2003), abstracts, para [0050], [0091], [0113], [0117]</td>
<td>15-17, and 20</td>
</tr>
</tbody>
</table>

D Further documents are listed in the continuation of Box C

D

* 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 application or patent 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 9 July 2009 (09 07 2009)

Date of mailing of the international search report 2 Q J U L 7mg

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 571-273-3201

Authorized officer Lee W Young

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PCT OSP 571 272 7774

Form PCT/ISA/210 (second sheet) (April 2007)
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

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)

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

--- See attached 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 additional fees, this Authority did not invite payment of additional fees

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. Group I Claims 1-3, 7-10 and 15-17, and 20 directed to SEQ ID NO. 1, wherein claim 15 is restricted to SEQ ID NO. 1

**Remark on Protest**
- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation
- No protest accompanied the payment of additional search fees

Form PCT/ISA/2 10 (continuation of first sheet (2)) (April 2007)
Nucleic acids and peptides and methods of using thereof to identify subjects at risk for a TDP-43 proteinopathy are disclosed. An array is also disclosed which contains the nucleic acids and peptides.
Continuation of Box (II) - Lack of Unity

This application contains the following inventions or groups of inventions which are not so linked as to from a single general inventive concept under PCT Rule 13.1 In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I Claims 1-3, 7-10 and 15-17, and 20 relate to an isolated nucleic acid comprising at least ten contiguous nucleotides, and a method for identifying a subject at risk for a TOP-43 proteinopathy directed to SEQ ID NO 1, wherein claim 15 is restricted to SEQ ID NO 1.

Group II Claims 4-6, 11-14, 15-17, and 20 relate to an isolated peptide comprising at least ten contiguous amino acids, and a method for identifying a subject at risk for a TOP-43 proteinopathy, directed to SEQ ID NO 2, and wherein claim 15 is restricted to SEQ ID NO 2.

Group III Claims 15-18 and 20 relate to an array comprising a substrate having at least one address, the address comprising an epitope binding agent, wherein claim 15 is restricted to SEQ ID NO 1 and claim 18 is directed to SEQ ID NO 3.

Group IV Claims 15-18 and 20 relate to an array comprising a substrate having at least one address, the address comprising an epitope binding agent, wherein claim 15 is restricted to SEQ ID NO 2 and claim 18 is directed to SEQ ID NO 3.

Group V Claims 15-17, 19 and 20 relate to an array comprising a substrate having at least one address, the address comprising an epitope binding agent, wherein claim 15 is restricted to SEQ ID NO 1 and the binding in claim 19 is directed to SEQ ID NO 4.

Group VI Claims 15-17, 19 and 20 relate to an array comprising a substrate having at least one address, the address comprising an epitope binding agent, wherein claim 15 is restricted to SEQ ID NO 2 and the binding in claim 19 is directed to SEQ ID NO 4.

There is no special technical feature shared by Groups I-VI based on the unique amino acid and nucleotide sequences of the claimed inventions. The amino acid sequences represented by SEQ ID NO 1-4 are unique sequences and do not relate to a single general inventive concept because, under PCT Rule 13.2, the different polypeptides and nucleotides represented by the sequences are not common to one another but are different because they are composed of unique amino acid and nucleotide sequences and therefore represent different structure and function.

Accordingly, unity of invention is lacking under PCT Rule 13.1.