METHODS OF THERAPY AND DIAGNOSIS USING TARGETING OF CELLS THAT EXPRESS A HUMAN TRANSPORTER-LIKE PROTEIN

Certain cells, including types of cancer cells such as prostate cancer, are capable of expressing P-type ATPase-like (ATPβγ1) mRNA and protein. Targeting using ATPβγ1 polypeptides, nucleic acids encoding for ATPβγ1 polypeptides and anti-ATPβγ1 antibodies provides a method of killing or inhibiting that growth of cancer cells that express the ATPβγ1 protein. Methods of therapy and diagnosis of disorders associated with ATPβγ1 protein-expressing cells, such as breast, colon, lung, and prostate cancer, are described.
## INTERNATIONAL SEARCH REPORT

### A. CLASSIFICATION OF SUBJECT MATTER
- **IPC(7)**: A61K 39/395
- **US CL**: 424/130.1, 133.1

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.**: 424/130.1, 133.1

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)

### 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>X</td>
<td>US 6,531,309 B1 (HU et al) 11 March 2003 (11.03.03), column 13, line 55 to column 16, line 23, sequence ID No. 2.</td>
<td>1-3, 15</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
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<th>* Special categories of cited documents:</th>
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<tr>
<td><strong>&quot;A&quot;</strong> document defining the general state of the art which is not considered to be of particular relevance</td>
</tr>
<tr>
<td><strong>&quot;E&quot;</strong> earlier application or patent published on or after the international filing date</td>
</tr>
<tr>
<td><strong>&quot;L&quot;</strong> 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)</td>
</tr>
<tr>
<td><strong>&quot;O&quot;</strong> document referring to an oral disclosure, use, exhibition or other means</td>
</tr>
<tr>
<td><strong>&quot;P&quot;</strong> document published prior to the international filing date but later than the priority date claimed</td>
</tr>
<tr>
<td><strong>&quot;PP&quot;</strong> 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</td>
</tr>
<tr>
<td><strong>&quot;X&quot;</strong> 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</td>
</tr>
<tr>
<td><strong>&quot;Y&quot;</strong> 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</td>
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<tr>
<td><strong>&quot;E&quot;</strong> document member of the same patent family</td>
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Date of the actual completion of the international search: 12 May 2005 (12.05.2005)

Date of mailing of the international search report: 01 JUN 2005

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. (703) 305-3230

Authorized officer:
- Sheela J. Huff
- Telephone No. 571272-1600

Form PCT/ISA/210 (second sheet) (January 2004)
BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form 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, claim(s) 1-5, 9-11 and 15, drawn to pharmaceutical compositions and methods of targeting and killing the growth of ATPHy1-expressing cells that cause cancer using an anti-ATPHy1 antibody.

Group II, claim(s) 6, 9, 11, 16, drawn to methods of killing the growth of ATPHy1-expressing cells that cause cancer using an ATPHy1 antigen.

Group III, claim(s) 7, 9, 11 and 17, drawn to methods of killing the growth of ATPHy1-expressing cells that cause cancer using an ATPHy1 polynucleotide.

Group IV, claim(s) 8-9, 11 and 18, drawn to methods of killing the growth of ATPHy1-expressing cells that cause cancer using an antigen presenting cells with a nucleic acid sequence.

Group V, claim(s) 12-13, drawn to method of diagnosing cancer using mRNA.

Group VI, claim(s) 12 and 14, drawn to method of diagnosing cancer using antiboides.

Group VII, claim(s) 19-20, drawn to polypeptide and compositions directed to Seq Id NO. 5.

Group VIII, claim(s) 21-24, drawn to antibody to Seq Id NO. 5.

The inventions listed as Groups I-VIII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Each of the products of Groups VII and VIII differ structurally and functionally. Each of the methods of Groups I-IV use products that differ structurally and functionally. Each of the methods of Groups VI and VI use products that differ structurally and functionally.