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A61K 31/343 (2006.01) *A61P 25/28* (2006.01)
A61K 31/34 (2006.01) *A61P 35/00* (2006.01)

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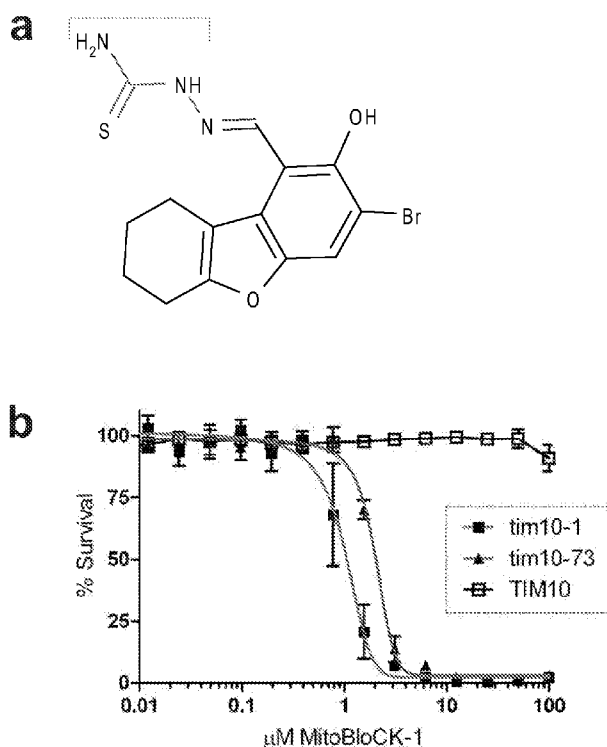
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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR,

[Continued on next page]

(54) Title: MODULATORS OF MITOCHONDRIAL PROTEIN IMPORT

Figure 2



(57) Abstract: The present invention provides compounds that modulate protein translocation in mitochondria, compositions thereof, and methods of identifying, making and using these.



KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*
- *with sequence listing part of description (Rule 5.2(a))*

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

17 January 2013

A. CLASSIFICATION OF SUBJECT MATTER

A61K 31/403(2006.01)i, A61K 31/40(2006.01)i, A61K 31/343(2006.01)i, A61K 31/34(2006.01)i, A61K 31/41(2006.01)i, A61P 25/16(2006.01)i, A61P 25/28(2006.01)i, A61P 35/00(2006.01)i

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)

A61K 31/403; C07D 209/88; C07D; C07D 209/00; A61K 31/40; A61K 31/343; A61P 25/16; A61P 25/28; A61P 35/00

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)

eKOMPASS (KIPO internal), NCBI (PubMed, MeSH), Google

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SAMUEL A. HASSON et al., `Substrate specificity of the TIM22 mitochondrial import pathway revealed with small molecule inhibitor of protein translocation`, PNAS, 2010, Vol. 107, No. 21, pp. 9578-9583, ISSN 1091-6490	1-8, 18-25
A	See p. 9578, right column, line 23 - p. 9579, right column, line 53; figures 2-6; discussion; abstract.	26-35
A	WO 2005-026112 A2 (ELIXIR PHARMACEUTICALS, INC.) 24 March 2005 See the whole document.	1-8, 18-35
A	WO 98-04527 A1 (AMERICAN HOME PRODUCTS CORPORATION) 05 February 1998 See the whole document.	1-8, 18-35



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 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 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

08 NOVEMBER 2012 (08.11.2012)

Date of mailing of the international search report

09 NOVEMBER 2012 (09.11.2012)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/033279

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005-026112 A2	24.03.2005	AU 2005-284851 A1 CA 2538759 A1 CA 2578355 A1 CN 101035527 A0 EP 1677794 A2 EP 1793817 A2 JP 04-908215 B2 JP 2007-505148 A JP 2008-513370 A US 2005-0209300 A1 US 2006-0074124 A1 US 2009-0306168 A1 WO 2005-026112 A3 WO 2006-031894 A2	23.03.2006 24.03.2005 23.03.2006 12.09.2007 12.07.2006 13.06.2007 20.01.2012 08.03.2007 01.05.2008 22.09.2005 06.04.2006 10.12.2009 24.11.2005 23.03.2006
WO 98-04527 A1	05.02.1998	AU 4043397 A BR 9710597 A CA 2261588 A1 CN 1230948 A0 EP 0923552 A1 HU 9904054 A2 IL 128031 D0 JP 2000-515887 A KR 10-2000-0029545 A NZ 334320 A ZA 9706611 A	20.02.1998 17.08.1999 05.02.1998 06.10.1999 23.06.1999 28.04.2000 30.11.1999 28.11.2000 25.05.2000 28.10.1999 25.01.1999

INTERNATIONAL SEARCH REPORTInternational application No.
PCT/US2012/033279**Box No. 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.: 9-17
because they relate to subject matter not required to be searched by this Authority, namely:
The claims 9-17 pertain to methods for treatment of the human body by therapy, and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(I) of the PCT and Rule 39.1(iv) of the Regulations under the PCT, to search.
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 No. 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:

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 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.