



(51) International Patent Classification:

A61K 31/7105 (2006.01) C12N 15/11 (2006.01)
C12N 15/10 (2006.01) C12N 9/78 (2006.01)

(21) International Application Number:

PCT/US2023/072322

(22) International Filing Date:

16 August 2023 (16.08.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/399,400 19 August 2022 (19.08.2022) US

(71) Applicant: **THE BOARD OF TRUSTEES OF THE LELAND STANFORD JUNIOR UNIVERSITY** [US/US]; Office of the General Counsel, Building 170, 3rd Floor, Main Quad, P.O. Box 20386, Stanford, CA 94305-2038 (US).

(72) Inventors: **GAO, Xiaojing**; Stanford Office of Technology Licensing, 415 Broadway Street, 2nd Floor, MC8854, Redwood City, CA 94063 (US). **ZHANG, Xiaowei**; Stanford Office of Technology Licensing, 415 Broadway Street, 2nd Floor, MC8854, Redwood City, CA 94063 (US). **KASENIT, Kristjan, E.**; Stanford Office of Technology Licensing, 415 Broadway Street, 2nd Floor, MC8854, Redwood City, CA 94063 (US). **MILLE FRAGOSO, Luis Santiago**; Stanford Office of Technology Licensing, 415 Broadway Street, 2nd Floor, MC8854, Redwood City, CA 94063 (US). **CALL, Connor, C.**; Stanford Office of Technology Licensing, 415 Broadway Street, 2nd Floor, MC8854, Redwood City, CA 94063 (US).

(74) Agent: **FIELD, Bret, E.**; 201 Redwood Shores Parkway, Suite 200, Redwood City, CA 94065 (US).

(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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

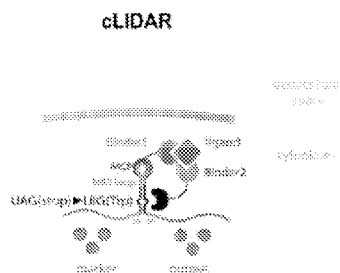
- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
- with sequence listing part of description (Rule 5.2(a))

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

28 March 2024 (28.03.2024)

(54) Title: SENSE-AND-RESPONSE OF PROTEINS, PEPTIDES, AND SMALL MOLECULES USING LIGAND-INDUCED DIMERIZATION ACTIVATING RNA EDITING (LIDAR)

FIG. 1A



(57) Abstract: The present disclosure provides a method for ligand induced ADAR (adenosine deaminase acting on RNA) mediated expression of an RNA coding sequence, the method comprising contacting a ligand with a cell associated LIDAR mediated expression system comprising: 1) an output RNA, 2) a stem loop binding protein and 3) an RNA editing protein; to express the RNA coding sequence. The present disclosure also provides compositions and kits for practicing the methods disclosed herein.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 23/72322

A. CLASSIFICATION OF SUBJECT MATTER
 IPC - INV. A61K 31/7105 (2023.01)
 ADD. C12N 15/10, C12N 15/11, C12N 9/78 (2023.01)

 CPC - INV. A61K 31/7105

 ADD. C12N 15/102, C12N 2310/20, C12Y 305/04004

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)
 See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KASENIIT et al., Modular and programmable RNA sensing using ADAR editing in living cells. bioRxiv preprint doi: https://doi.org/10.1101/2022.01.28.478207 ; this version posted January 29, 2022. [online]. [Retrieved on 12 November 2023]. Retrieved from the internet: <URL: https://www.biorxiv.org/content/10.1101/2022.01.28.478207v1.full.pdf > Abstract; pg 3, para 1; pg 3, last para-pg 4, para 1; pg 4, para 3; pg 6, last para; pg 6, last para-pg 7, para 1	1-5
Y	RAUCH et al., Small Molecule-Inducible RNA-Targeting Systems for Temporal Control of RNA Regulation. ACS Cent. Sci. 2020, Vol. 6, pg 1987-1996. Abstract; pg 1988, col 2, last para; pg 1991, col 2, para 3; Figure 1 legend	1-5

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

* Special categories of cited documents:	“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
“A” document defining the general state of the art which is not considered to be of particular relevance	“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
“D” document cited by the applicant in the international application	“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
“E” earlier application or patent but published on or after the international filing date	“&” document member of the same patent family
“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	

Date of the actual completion of the international search 12 November 2023	Date of mailing of the international search report JAN 17 2024
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	Authorized officer Kari Rodriguez Telephone No. PCT Helpdesk: 571-272-4300

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 23/72322

Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.c of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of a sequence listing:
 - a. forming part of the international application as filed.
 - b. furnished subsequent to the international filing date for the purposes of international search (Rule 13ter.1(a)),
 accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this report has been established to the extent that a meaningful search could be carried out without a WIPO Standard ST.26 compliant sequence listing.
3. Additional comments:

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 23/72322

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.:
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.: 6-20
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 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.:

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.