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- (71) **Applicant (for all designated States except US):** **OPKO PHARMACEUTICALS, LLC** [US/US]; 4400 Biscayne Blvd., Miami, FL 33137 (US).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** **MOOLA, Muralidhar, Reddy** [US/US]; 807 University Boulevard, #106, Jupiter, FL 33458 (US). **SCHILKE, Jessica** [US/US]; 1315 Duval Street, Jupiter, FL 33458 (US).
- (74) **Agent:** **COHEN, Mark, S.**; Pearl Cohen Zedek Latzer, LLP, 1500 Broadway, 12th Floor, New York, NY 10036 (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, 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, 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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[Continued on next page]

(54) **Title:** DIAGNOSTIC AND TREATMENT METHODS USING A LIGAND LIBRARY

TentaGel screen flow chart

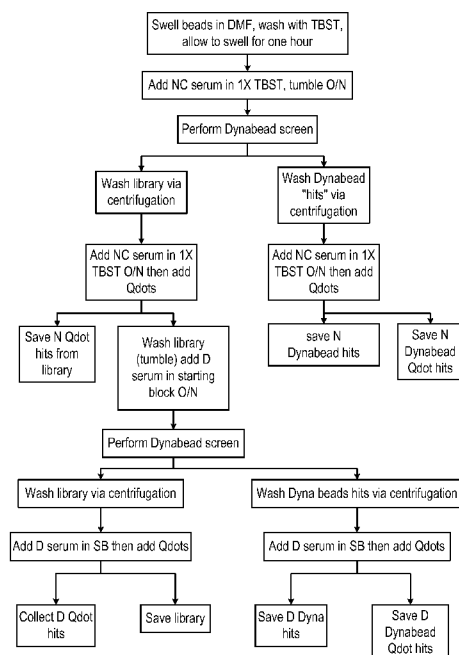


FIGURE 6

(57) **Abstract:** The invention relates to diagnostic and treatment methods using a ligand library. Specifically, the invention relates to using a ligand library to diagnose or detect a drug induced response, including drug adverse reaction, side effects, drug resistance, and therapeutic efficacy. The invention further relates to identifying biomarkers associated with a drug induced response and providing a personalized medical treatment.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - C07K 17/14 (2011.01) USPC - 424/278.1 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) IPC(8) - A61K 38/00, 38/02, 39/00, 39/02, 39/12, 39/395; C07K 7/02, 16/00, 16/08, 16/12, 16/18, 16/22, 16/24, 16/28, 17/14 (2012.01) USPC - 424/9.341, 184.1, 278.1; 530/323, 388.73, 389.1, 389.2, 389.4, 389.5, 389.7 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) Patbase, PubChem, Google Patent		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X - Y	US 2009/0246124 A1 (KODADEK et al) 01 October 2009 (01.10.2009) entire document	1-8, 11, 12, 17-30, 32-39, 43, 47-49, 52, 55, 56, 58-62, 67-69, 73-75, 78, 79, 81-83, 85-88, 90, 91, 94-97 9, 10, 13, 31, 40-42, 50, 51, 53, 54, 57, 63, 70-72, 76, 77, 80, 84, 89, 92, 93
X - Y	US 2010/0303805 A1 (MOOLA et al) 02 December 2010 (02.12.2010) entire document	44, 45 10, 31, 42, 50, 51, 77, 89, 93
X	US 2002/0018778 A1 (CAPLAN) 14 February 2002 (14.02.2002) entire document	46
Y	US 7,354,584 B2 (REED et al) 08 April 2008 (08.04.2008) entire document	9, 76
Y	GARCIA-ARRARAS et al. (23 July 1993) Enteric nerve fibers of holothurians are recognized by an antibody to acetylated alpha-tubulin. Neuroscience Letters, 1993, Vol. 157, Pgs. 153-156. entire document	13, 63
☒ Further documents are listed in the continuation of Box C. ☐		
* 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 11 June 2012		Date of mailing of the international search report 20 JUN 2012
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: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/030223

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.: 14, 64
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:
Claims 14 and 64 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claims 14 and 64 are indefinite for the following reason(s): With regard to claims 14 and 64, R-groups R7 and R8 are undefined rendering the claims unsearchable.

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 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.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/030223

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2009/0111102 A1 (DIEHL et al) 30 April 2009 (30.04.2009) entire document	40-42, 50, 51
Y	US 2007/0054847 A1 (GOZES et al) 08 March 2007 (08.03.2007) entire document	53, 54
Y	US 2010/0266610 A1 (ZMUDA et al) 21 October 2010 (21.10.2010) entire document	57
Y	US 2010/0303835 A1 (GOCKE et al) 02 December 2010 (02.12.2010) entire document	70, 72, 80
Y	US 7,776,313 B2 (FISH et al) 17 August 2010 (17.08.2010) entire document	71, 92
Y	US 5,834,318 A (BUETTNER) 10 November 1998 (10.11.1998) entire document	84
A	NEUMANN et al. SPR-based Fragment Screening: Advantages and Applications. Current Topics in Medicinal Chemistry, 2007, Vol. 7, Pgs. 1630-1642. entire document	21-26, 84