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(71) Applicant (for all designated States except US): **NEW WORLD PHARMACEUTICALS, LLC** [US/US]; 6 Edwards Point Road, Rumson, NJ 07760 (US).

(72) Inventors; and

(71) Applicants (for US only): **SEXTON, Frederick, A.** [US/US]; 6 Edwards Point Road, Rumson, NJ 07760 (US). **TRACY, Timothy, S.** [US/US]; 3720 Park Ridge Lane, Lexington, KY 40509 (US). **KRISHNAN, Sitaraman**

[IN/US]; 402 Swan Street, Potsdam, NY 13676 (US). **VENDRA, Venkat, K.** [IN/US]; 781 Theodore Burnett Court, Apt., University Park Apartments, Louisville, KY 40217 (US). **MYRICK, James, M.** [US/US]; 6 Washington Street, Potsdam, NY 13676 (US).

(74) Agent: **EHRHARD, Kathleen, N.**; Frommer Lawrence & Haug LLP, 745 Fifth Avenue, New York, NY 10151 (US).

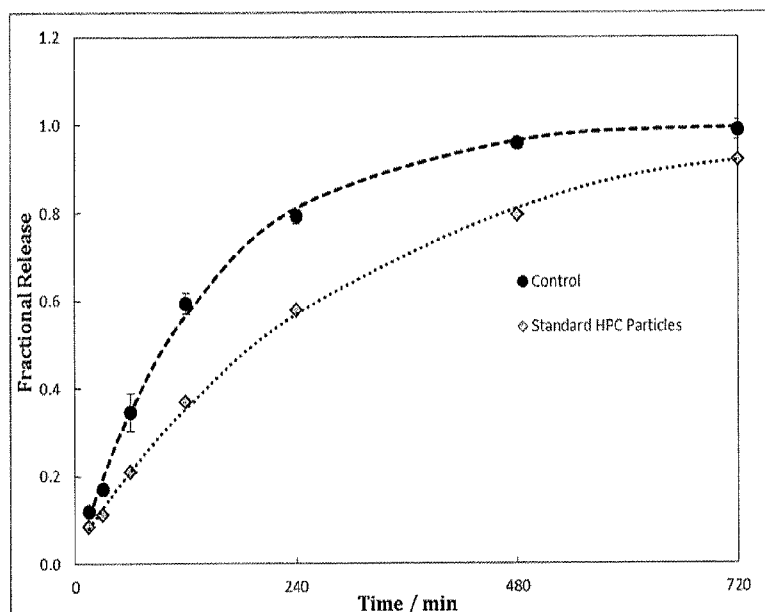
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[Continued on next page]

(54) Title: METHODS AND RELATED COMPOSITIONS FOR IMPROVED DRUG BIOAVAILABILITY AND DISEASE TREATMENT

Figure 6



(57) Abstract: The present invention relates to methods and compositions for improved drug bioavailability and disease treatment, including treatment of diseases related to hormone modulation or CNS function. In certain embodiments, the instant invention provides methods for hormone modulation or improving CNS function, comprising administering to a subject in need thereof a composition comprising one or more hydrogel particles, wherein the one or more hydrogel particles are non-toxic and incorporate at least one active agent, wherein the one or more hydrogel particles release the active agent in a time-controlled and sustained manner in vivo.

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SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, KM, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the  
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INTERNATIONAL SEARCH REPORT

International application No  
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A. CLASSIFICATION OF SUBJECT MATTER  
 INV. A61K9/00 A61K9/16 A61K31/155 A61K31/198 A61K31/22  
 A61K31/4164 A61K31/519 A61K31/522 A61K31/7004 A61K31/7072  
 ADD.  
 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  
 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)  
 EPO-Internal, BIOSIS, CHEM ABS Data, EMBASE, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2014/037830 A1 (SEXTON FREDERICK A [US] ET AL) 6 February 2014 (2014-02-06) paragraph [0003] paragraph [0107] - paragraph [0109] paragraph [0249] - paragraph [0323] claims 1-30	1,12-27, 34
Y	US 2011/142937 A1 (MACDONALD R LOCH [CA]) 16 June 2011 (2011-06-16) the whole document	1
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Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p>
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Date of the actual completion of the international search  7 October 2015	Date of mailing of the international search report  28/01/2016
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Ganschow, Silke
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2015/040811

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	HOGERVORST ET AL: "CAFFEINE IMPROVES COGNITIVE PERFORMANCE AFTER STRENOUS PHYSICAL EXERCISE", INTERNATIONAL JOURNAL OF SPORTS MEDICINE, THIEME, STUTTGART, DE, vol. 20, 1 January 1999 (1999-01-01), pages 354-361, XP008073537, ISSN: 0172-4622 the whole document	1
Y	----- CN 102 935 070 A (UNIV WUHAN TECH) 20 February 2013 (2013-02-20) the whole document -----	1

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2015/040811

## 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.:  
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:

see 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 an 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.:  
  
1, 18, 19(completely); 12-17, 20-27, 34(partially)

### 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.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1, 18, 19(completely); 12-17, 20-27, 34(partially)

Method of improving cognitive function comprising administering to a subject hydrogel particles which release an active agent in a time-controlled and sustained manner

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2. claims: 2, 3, 31(completely); 12-17, 20-27, 34(partially)

Method of treating a CNS disease comprising administering to a subject hydrogel particles which release an active agent in a time-controlled and sustained manner

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3. claims: 4-6, 28-30(completely); 12-16, 20-27, 34(partially)

Method of treating a metabolic disorder comprising administering to a subject hydrogel particles which release an active agent in a time-controlled and sustained manner

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4. claims: 7-9(completely); 12-17, 20-27, 34(partially)

Method of increasing satiety hormone release comprising administering to a subject hydrogel particles which release an active agent in a time-controlled and sustained manner

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5. claims: 10, 11(completely); 12-17, 20-27, 34(partially)

Method of decreasing hunger hormone release comprising administering to a subject hydrogel particles which release an active agent in a time-controlled and sustained manner

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6. claims: 32, 33(completely); 12-17, 20-27, 34(partially)

Method of treating a cardiovascular disorder comprising administering to a subject hydrogel particles which release an active agent in a time-controlled and sustained manner

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2015/040811

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