Abstract: The present invention relates to compounds of Formula (I), (II), (III) or (IV), or pharmaceutically acceptable salts, esters, or prodrugs thereof, which inhibit serine protease activity, particularly the activity of hepatitis C virus (HCV) NS3-NS4A protease. Consequently, the compounds of the present invention interfere with the life cycle of the hepatitis C virus and are also useful as antiviral agents. The present invention further relates to pharmaceutical compositions comprising the aforementioned compounds for administration to a subject suffering from HCV infection. The invention also relates to methods of treating an HCV infection in a subject by administering a pharmaceutical composition comprising a compound of the present invention.
Published: 3 July 2008

— with international search report

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

3 July 2008
INTERNATIONAL SEARCH REPORT

INTERNATIONAL APPLICATION No
PCT/US07/75066

A CLASSIFICATION OF SUBJECT MATTER
IPC A61K 38/12( 2006 01);C07K 7/64( 2006 01)

USPC 514/1 1,9,530/3 17

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 514/1 1,9, 530/3 17

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

Electronic database consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No</th>
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<tr>
<td>X</td>
<td>US 20050153877 A1 (MIAO et al) 14 July 2005 (14 07 2005), throughout, e.g. paragraphs 85-97, 426, 484</td>
<td>1-1-7</td>
</tr>
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</table>

☐ Further documents are listed in the continuation of Box C

D See patent family annex

Date of the actual completion of the international search
27 March 2008 (27 03 2008)

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

Date of mailing of the international search report
08 APR 2008

Authorized officer
Andrew Kossar

Telephone No (571) 272-1600

Form PCT/ISA/210 (second sheet) (April 2007)
**INTERNATIONAL SEARCH REPORT**

<table>
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<th>Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)</th>
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<td>This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons</td>
</tr>
<tr>
<td>1</td>
<td>☐ Claims Nos because they relate to subject matter not required to be searched by this Authority, namely</td>
</tr>
<tr>
<td>2</td>
<td>☐ 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</td>
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<td>3</td>
<td>☑ Claims Nos because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6 4(a)</td>
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<th>Observations where unity of invention is lacking (Continuation of item 3 of first sheet)</th>
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<td>This International Searching Authority found multiple inventions in this international application, as follows</td>
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<tr>
<td>1</td>
<td>☑ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims</td>
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<td>☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees</td>
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<td>☑ 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</td>
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<td>4</td>
<td>☐ 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</td>
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**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
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) 1-6 and 13-17, drawn to compounds of formulae (I)-(IV) and pharmaceutical compositions thereof

Group II, claim(s) 7-11, drawn to methods of treating HCV infections

Group III, claim(s) 12, drawn to a process of making compounds of formulae (I)-(IX)

The inventions listed as Groups I-III 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 MIAO (US 2005/0153877 Al) teaches compounds of the general structure, e.g. [0426] which do not have the same G group, however formula II [0085]) and the compounds described therein overlap with the instant generic formula I Thus, the technical feature is not a contribution over the art and the claims lack unity

Continuation of B FIELDS SEARCHED Item 3
STN (registry.cap)- structures of claim 1 EAST (uspat,usocr,pgpubjpo,epo,derwent,fprs)- "Yat Sun Or" HCV inhibitor