International Application PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

Title: MODIFICATIONS OF CST-II FOR INCREASED PROTEIN EXPRESSION

Abstract: The present invention provides modified Campylobacter sialyltransferase proteins that exhibit enhanced expression as compared to its unmodified form. Nucleic acids that encode the sialyltransferase proteins are also included, as are methods to produce and use the sialyltransferase proteins.
INTERNATIONAL SEARCH REPORT

International application No
PCT/US 07/02878

A CLASSIFICATION OF SUBJECT MATTER
IPC(8) - ...
USPC - 435/69, 900/240, 900/200

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)
USPC 435/69 1 900/240 900/200

Facsimile No 571 272-4300

Form PCT/ISA/210 (second sheet) (Ap π l 2007)

C DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document with indication where appropriate of the relevant passages</th>
<th>Relevant to claim No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hrel et al Extent of N terminal methionine excision from Escherichia coli proteins is governed by the side chain length of the penultimate amino acid Proc Nat Acad Sci (USA) November 1989 Vol 86 No 21 Pg 8247-8251 especially abstract and pg 8250 Table 1</td>
<td>7 14 18 19</td>
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</tbody>
</table>

D Further documents are listed in the continuation of Bo C

E Additional documents listed above are not considered to be of particular relevance

F Additional documents listed above are earlier application or patent but published on or after the international filing date

G Additional documents listed above are not cited in the search but were considered during the search

H Additional documents listed above are not cited in the search and were not considered during the search

I Additional documents listed above are not published on or before the examined priority date of the international application

J Additional documents listed above are cited in the search of the international search of this application but not in the search referred to in (I)

K Additional documents listed above are not cited in the search of the international search of this application but were considered during the search referred to in (I)

T Additional documents listed above are later document published after the international filing date of the application but cited to understand the principle or theory underlying the invention

Y Additional documents listed above are not documents of particular relevance and cannot be considered to involve an inventive step when the document is considered alone

Date of the actual completion of the international search
16 July 2008 (16 07 2008)

Date of mailing of the international search report
04 AUG 2008

Authorized officer
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Facsimile No 571 273-3201

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This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. **LJ** Claims Nos because they relate to subject matter not required to be searched by this Authority, namely

2. **D** 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. **D** Claims Nos because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

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This International Searching Authority found multiple inventions in this international application, as follows:

Groups 1-X Claims 1-19 directed to a tagged sialyltransferase protein selected from the group consisting of SEQ ID Nos 4-10 a tagged sialyltransferase protein comprising motif A represented by SEQ ID Nos 11-12 and an expression vector represented by SEQ ID NO 3 wherein each group is represented by one of SEQ ID Nos 4-12 and 3 respectively.

The inventions listed as Groups 1-X 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:

(continued in Extra Box)

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 onh some of the required additional search fees were timely paid by the applicant this international search report uners noH 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 Claims 1-19 directed to a tagged sialyltransferase protein restricted to SEQ ID No 4 (Claims 1-4 7 9 10 12-19).

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.
continuation of Box III

The 10 groups are the 9 tagged sialyltransferase protein sequences represented by SEQ ID NOs 4-12 and the expression vector represented by the nucleic acid sequence of SEQ ID NO 3. The different sequences represented by the amino acid content of each group and the nucleic acid sequence are different structures that are not common to one another but are different because they are composed of unique amino acid and nucleic acid sequences. Further, the common technical feature of the listed groups is a sialyltransferase protein. However, this is not an improvement over the prior art of US 6,689,604 B1 to Gilbert, et al (10 February 2004) that teaches a sialyltransferase polypeptide from Campylobacter vectors for expression, and its use (col 2 ln 65-col 3 ln 1, col 3 ln 16-27, col 3 ln 28-34). Therefore, the inventions listed as Groups I-X lack unity of invention under PCT Rule 13 because they do not share a same or corresponding special technical feature.