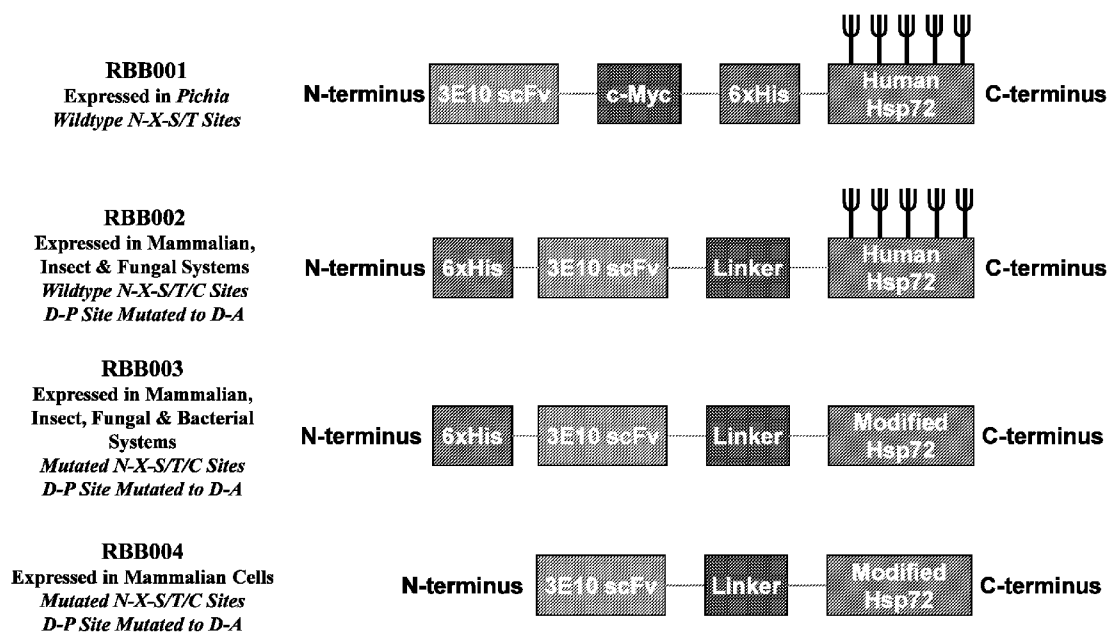




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(54) Title: MODIFIED HEAT SHOCK PROTEINS

Figure 7. Fv-HSP72 Variants



(57) Abstract: The present disclosure generally relates to modified heat shock protein compositions that improve intracellular performance when delivered across the plasma and/or nuclear membranes. Also provided are methods for treating ocular, neurological, muscular, hepatic, renal, integumentary, cardiovascular and pulmonary conditions with the modified heat shock proteins are disclosed herein.

[Continued on next page]



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## INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER  
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ADD.

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## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
C07K

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, Sequence Search, EMBASE, FSTA

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE Geneseq [Online]</p> <p>18 May 2017 (2017-05-18), "Schizothorax prenanti heat shock protein 60 (HSP60), SEQ:3.", XP002787814, retrieved from EBI accession no. GSP:BDS86195 Database accession no. BDS86195 sequence</p> <p>----- -/--</p>	<p>1-6,8,9, 13-15, 20,38,39</p>



Further documents are listed in the continuation of Box C.



See patent family annex.

\* 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

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Name and mailing address of the ISA/

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Behrens, Joyce

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2018/047976

## 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.:

1-44(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.

## INTERNATIONAL SEARCH REPORT

International application No

PCT/US2018/047976

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>YAROSLAV G. GURSKIY ET AL: "The development of modified human Hsp70 (HSPA1A) and its production in the milk of transgenic mice", CELL STRESS AND CHAPERONES, vol. 21, no. 6, 10 August 2016 (2016-08-10), pages 1055-1064, XP055540453, EDINBURGH, GB ISSN: 1355-8145, DOI: 10.1007/s12192-016-0729-x abstract; pages 1058-1059</p> <p>-----</p>	<p>7,10-12, 16-19, 21-37, 40-44</p>
A	<p>Ming Y Cheng: "The mitochondrial chaperonin hsp60 is required for its own assembly", Nature, 29 November 1990 (1990-11-29), pages 455-458, XP055540633, Retrieved from the Internet: URL:<a href="https://www.nature.com/articles/348455a0.pdf">https://www.nature.com/articles/348455a0.pdf</a> [retrieved on 2019-01-10] abstract</p> <p>-----</p>	<p>1-44</p>
A	<p>HAO JIA ET AL: "Elimination of N-glycosylation by site mutation further prolongs the half-life of IFN-[alpha]/Fc fusion proteins expressed in Pichia pastoris", MICROBIAL CELL FACTORIES, vol. 15, no. 1, 1 December 2016 (2016-12-01), XP055540646, DOI: 10.1186/s12934-016-0601-9 abstract</p> <p>-----</p>	<p>1-44</p>

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

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

1. claims: 1-44(partially)

A modified chaperonin in which one or more of  
N-glycosylation site is modified such that N-glycosylation  
at the modified site is substantially reduced as compared to  
N-glycosylation at the corresponding unmodified site.

---

2-7. claims: 1-44(partially)

A modified HSP27, HSP40, HSP60, HSP70, HSP90, HSP105/110 or  
small heat shock protein in which one or more of  
N-glycosylation site is modified such that N-glycosylation  
at the modified site is substantially reduced as compared to  
N-glycosylation at the corresponding unmodified site.

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