

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL SEARCH REPORT**

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>49717-3029</b>	<b>FOR FURTHER ACTION</b> <span style="float: right;">see Form PCT/ISA/220 as well as, where applicable, item 5 below</span>	
International application No. <b>PCT/CA2018/050977</b>	International filing date ( <i>day/month/year</i> ) 13 August 2018 (13-08-2018)	(Earliest)Priority date ( <i>day/month/year</i> ) 14 August 2017 (14-08-2017)
Applicant THE GOVERNING COUNCIL OF THE UNIVERSITY OF TORONTO		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

- the international application in the language in which it was filed.
- a translation of the international application into \_\_\_\_\_ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b.  This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c.  With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2.  **Certain claims were found unsearchable** (see Box No. II).

3.  **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

- the text is approved as submitted by the applicant.
- the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- the text is approved as submitted by the applicant.
- the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

- as suggested by the applicant.
- as selected by this Authority, because the applicant failed to suggest a figure.
- as selected by this Authority, because this figure better characterizes the invention.

b.  none of the figures is to be published with the abstract.

**Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.c of the first sheet)**

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of a sequence listing:

- a.  forming part of the international application as filed:
- in the form of an Annex C/ST.25 text file.
  - on paper or in the form of an image file.
- b.  furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
- c.  furnished subsequent to the international filing date for the purposes of international search only:
- in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
  - on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
2.  In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/CA2018/050977**

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC: *C12Q 1/6813* (2018.01), *C12M 1/34* (2006.01), *C12Q 1/6809* (2018.01), *C12Q 1/6876* (2018.01),  
*C12Q 1/6886* (2018.01), *G06F 19/20* (2011.01)

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: ALL

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

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)  
 Canadian Patent Database, Questel Orbit, Pubmed, Google Scholar, Google Patent, Google, SCOPUS  
 Keywords: nanoparticle, magnetic, mRNA, capture, cell, cytometry, CTC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2014/166000 A1 (KELLEY, S. et al.) 16 October 2014 (16-10-2014) See entire document	1-18
P, X	LABIB, M. et al., "Single-cell mRNA cytometry via sequence-specific nanoparticle clustering and trapping". Nature Chemistry, 2 April 2018 (02-04-2018), Vol. 10, pp. 489-95, ISSN 1755-4349 See entire document	1-18

Further documents are listed in the continuation of Box C.

See patent family annex.

* "A" "E" "L" "O" "P"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance earlier application or patent but published on or after the international filing date 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) document referring to an oral disclosure, use, exhibition or other means document published prior to the international filing date but later than the priority date claimed	"T" "X" "Y" "&"	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 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 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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Date of the actual completion of the international search  
 22 October 2018 (22-10-2018)

Date of mailing of the international search report  
 29 October 2018 (29-10-2018)

Name and mailing address of the ISA/CA  
 Canadian Intellectual Property Office  
 Place du Portage I, C114 - 1st Floor, Box PCT  
 50 Victoria Street  
 Gatineau, Quebec K1A 0C9  
 Facsimile No.: 819-953-2476

Authorized officer  
 Stephen Misener (819) 639-6840

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.

**PCT/CA2018/050977**

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
WO2014166000A1	16 October 2014 (16-10-2014)	WO2014166000A1 US2016061811A1 US10073079B2	16 October 2014 (16-10-2014) 03 March 2016 (03-03-2016) 11 September 2018 (11-09-2018)

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