

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

To:
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250 University Avenue
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Canada, M5H 3E5

Date of mailing 29 October 2018 (29-10-2018)
(*day/month/year*)

Applicant's or agent's file reference
49717-3029

FOR FURTHER ACTION
See paragraph 2 below

International application No. PCT/CA2018/050977	International filing date (<i>day/month/year</i>) 13 August 2018 (13-08-2018)	Priority date (<i>day/month/year</i>) 14 August 2017 (14-08-2017)
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International Patent Classification (IPC) or both national classification and IPC
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)

Applicant
THE GOVERNING COUNCIL OF THE UNIVERSITY OF TORONTO

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

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.: 001-819-953-2476	Date of completion of this opinion 25 October 2018 (25-10-2018)	Authorized officer Stephen Misener (819) 639-6840
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Box No I **Basis of this opinion**

1. With regard to the **language**, this opinion has been established 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)).

2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established 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 13*ter*.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 13*ter*.1(a)).
 - on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. 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.

5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-18	YES
	Claims None	NO
Inventive step (IS)	Claims 1-18	YES
	Claims None	NO
Industrial applicability (IA)	Claims 1-18	YES
	Claims None	NO

2. Citations and explanations:

D1: WO 2014/166000 A1 (KELLEY, S. et al.) 16 October 2014 (16-10-2014)

Claims 1-18 are novel and therefore comply with PCT Article 33(2). Document D1 is considered to represent the closest prior art. Document D1 discloses a device and methods for capturing cells in a flow where the cells may be labelled with magnetic nanoparticle coated with antibodies specific for cell-surface receptors. The device may be coupled to a chip-based analysis of mRNA wherein the cells isolated by the flow device are lysed and mRNA expression levels determined. However, the cited document does not disclose the use of magnetic nanoparticles bound to mRNA targeting capture probes for use in magnetically capturing cells in a multi-zone capture device. Claims 1-18 are therefore novel.

Claims 1-18 involve an inventive step and therefore comply with PCT Article 33(3). The use of magnetic nanoparticles bound to mRNA targeting capture probes for use in magnetically capturing cells in a multi-zone capture device would not have been obvious to a person skilled in the art having regard to the cited document. Claims 1-18 therefore involve an inventive step.

The subject matter of claims 1-18 is considered to be industrially applicable and thus complies with the requirements of PCT Article 33(4).