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(81) Designated States (unless otherwise indicated, for every kind of national protection available):

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CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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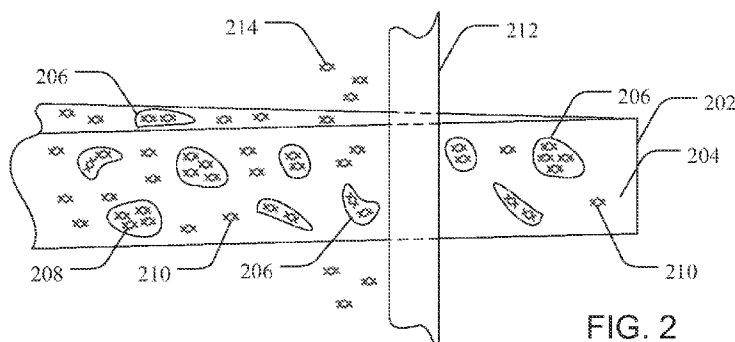


FIG. 2

(57) Abstract: Systems, devices, and methods for protecting a biological material during delivery into a biological structure are provided. In one aspect, for example, a device for protecting and delivering a preselected biological material into a biological structure can include a lance operable to maintain a charge capable of associating a biological material thereto and at least one protective region formed on or in the lance, where the protective region protects the biological material during delivery into a biological structure.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/038640**A. CLASSIFICATION OF SUBJECT MATTER***C12N 15/87(2006.01)i, C12N 15/89(2006.01)i, C12N 13/00(2006.01)i, C12N 5/10(2006.01)i, C12M 1/42(2006.01)i*

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)

C12N 15/87; C12M 1/00; C12N 13/00; C12N 5/10; C12N 15/00; C12M 1/42

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: microinjection, charged lance, protective region

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2010-0323419 A1 (ATEN, QUENTIN T. et al.) 23 December 2010. See abstract, claims 1-7, 11-15, 18, 20, 22.	1-16
A	US 2009-0286319 A1 (MIYAWAKI, ATSUSHI et al.) 19 November 2009 See abstract, paragraphs 0055, 0057, 0063, 0066, 0069, claims 1-3, 9.	1-16
A	US 05457041 A (GINAVEN, ROBERT O. et al.) 10 October 1995. See abstract, column 8, lines 25-27, 33-36, claims 1, 16.	1-16
PX	ATEN, Q. T. et al., `Nanoinjection : pronuclear DNA delivery using a charged lance`, Transgenic Research, vol. 21(6), pp. 1279-1290 (14 March 2012, online publication) See abstract, Figure 2, p.1 right column, line 26 - p.2 left column, line 6, p.2 left column, line 45 - right column, line 4, p.3 left column, p.4 right column, lines 8-17.	1-16

 Further documents are listed in the continuation of Box C. See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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