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- (71) **Applicant:** CALIFORNIA INSTITUTE OF TECHNOLOGY [US/US]; 1200 E. California Blvd., M/C 210-85, Pasadena, California 91125 (US).
- (72) **Inventors:** RAJAGOPAL, Aditya; 27 Lee, Irvine, California 92620 (US). SCHERER, Axel; 1661 North Road, Barnard, Vermont 05031 (US). HENRY, Michael D.; 3351 La Corona Avenue, Altadena, California 91001 (US). WALAVALKAR, Sameer; 3912 Laurel Canyon, Apt. 308, Studio City, California 91604 (US). TOMBRELLO, Thomas; 2938 Santa Rosa Avenue, Altadena, California 91001 (US). HOMYK, Andrew P.; 1740 Huntington Drive, Apt. A, South Pasadena, California 91030 (US).
- (74) **Agents:** STEINFL, Alessandro et al.; 155 North Lake Avenue, Suite 700, Pasadena, California 91101 (US).

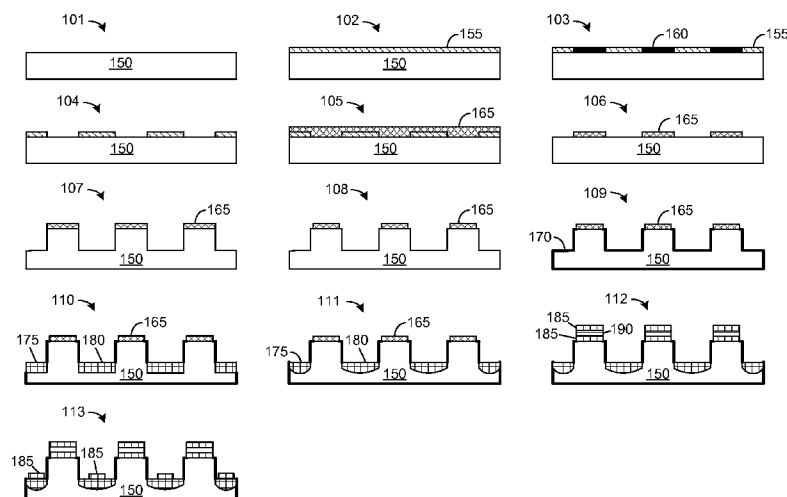
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[Continued on next page]

(54) **Title:** NANO-PILLAR TRANSISTOR FABRICATION AND USE**FIG. 1**

(57) **Abstract:** A field effect nano-pillar transistor has a pillar shaped gate element incorporating a biomimetic portion that provides various advantages over prior art devices. The small size of the nano-pillar transistor allows for advantageous insertion into cellular membranes, and the biomimetic character of the gate element operates as an advantageous interface for sensing small amplitude voltages such as transmembrane cell potentials. The nano-pillar transistor can be used in various embodiments to stimulate cells, to measure cell response, or to perform a combination of both actions.



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INTERNATIONAL SEARCH REPORT

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PCT/US2013/034315**A. CLASSIFICATION OF SUBJECT MATTER****H01L 21/336(2006.01)i, H01L 29/78(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)

H01L 21/336; G01N 1/18; H01L 29/80; H01L 21/28; H01L 21/425; G01N 33/48; H01L 21/338; G01N 33/53; G01N 1/10; G01N 27/414; H01L 29/78

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: transistor, etch, gate, bio, hydrophilic, hydrophobic

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2002-0164884 A1 (DAVID G. LISHAN) 07 November 2002 See abstract, paragraphs [0038]-[0046], [0059]-[0061] and figures 4, 7a.	1-22
A	KR 10-2012-0021683 A (KYUNGPOOK NATIONAL UNIVERSITY INDUSTRY-ACADEMIC COOPERATION FOUNDATION) 09 March 2012 See abstract, paragraphs [0018]-[0028] and figures 1-2.	1-22
A	KR 10-2010-0048380 A (KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY) 11 May 2010 See abstract, paragraphs [0054]-[0065], [0071]-[0077] and figures 1a-1b, 3.	1-22
A	US 6130098 A (KALYAN HANDIQUE et al.) 10 October 2000 See abstract, column 20, line 60 - column 21, line 33 and figure 8C.	1-22
A	US 2008-0070354 A1 (FAQUIR C. JAIN et al.) 20 March 2008 See abstract, paragraphs [0038]-[0041] and figure 4A.	1-22

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

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"P" document published prior to the international filing date but later than the priority date claimed

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Korean Intellectual Property Office
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan City,
302-701, Republic of Korea

Facsimile No. +82-42-472-7140

Authorized officer

CHOI, Sang Won

Telephone No. +82-42-481-8291



INTERNATIONAL SEARCH REPORT

Information on patent family members

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