



US009976187B2

(12) **United States Patent**  
**Bajic et al.**

(10) **Patent No.:** **US 9,976,187 B2**

(45) **Date of Patent:** **May 22, 2018**

(54) **METHYLATION BIOMARKERS FOR PROSTATE CANCER**

(58) **Field of Classification Search**

None

See application file for complete search history.

(71) Applicant: **KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, Thuwal (SA)**

(56) **References Cited**

U.S. PATENT DOCUMENTS

(72) Inventors: **Vladimir Bajic, Thuwal (SA); Hicham Mansour, Thuwal (SA); Roberto Incitti, Thuwal (SA)**

2007/0141582	A1	6/2007	Li et al.	
2009/0215066	A1	8/2009	Ahmed et al.	
2010/0303795	A1*	12/2010	Sorensen .....	A61K 31/192 424/94.6
2014/0094380	A1*	4/2014	Sherlock .....	C12Q 1/6886 506/9

(73) Assignee: **KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, Thuwal (SA)**

OTHER PUBLICATIONS

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 59 days.

Written Opinion of the International Searching Authority dated Nov. 15, 2013, issued in International Application No. PCT/IB2013/001887.

(21) Appl. No.: **14/408,238**

International Search Report dated Nov. 15, 2013, issued in International Application No. PCT/IB2013/001887.

(22) PCT Filed: **Jun. 11, 2013**

Notification Concerning Transmittal of International Preliminary Report on Patentability (Chapter I of the Patent Cooperation Treaty) dated Dec. 24, 2014, issued in International Application No. PCT/IB2013/001887.

(86) PCT No.: **PCT/IB2013/001887**

§ 371 (c)(1),

(2) Date: **Dec. 15, 2014**

Vanaja Donkena Krishna et al: "Hypermethylation of Genes for Diagnosis and Risk Stratification of Prostate Cancer", Cancer Investigation, vol. 27, No. 5, 2009, pp. 549-560, ISSN: 0735-7907.  
Kim Jung H et al: "Deep sequencing reveals distinct patterns of DNA methylation in prostate cancer", Genome Research, Cold Spring Harbor Laboratory Press, Woodbury, NY, US, vol. 21, No. 7, Jul. 1, 2011 (Jul. 1, 2011), pp. 1028-1041, XP009151377, ISSN: 1088-9051, DOI: 10.1101/GR.119347.110.

(87) PCT Pub. No.: **WO2013/186633**

PCT Pub. Date: **Dec. 19, 2013**

\* cited by examiner

(65) **Prior Publication Data**

US 2015/0292025 A1 Oct. 15, 2015

**Related U.S. Application Data**

*Primary Examiner* — Jeanine A Goldberg

(60) Provisional application No. 61/659,239, filed on Jun. 13, 2012.

(74) *Attorney, Agent, or Firm* — Smith, Gambrell & Russell, LLP; Charles Vorndran

(51) **Int. Cl.**

**C07H 21/04** (2006.01)

**C12Q 1/68** (2018.01)

(57) **ABSTRACT**

(52) **U.S. Cl.**

CPC ..... **C12Q 1/6886** (2013.01); **C12Q 2600/154** (2013.01); **C12Q 2600/172** (2013.01)

Different combinations of methylation status based biomarkers can be used to test for prostate cancer with high sensitivity and high specificity.

**2 Claims, No Drawings**