The United States of America

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Therefore, this

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Michelle K. Lee


US009096655B2

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

(10) **Patent No.: US 9,096,655 B2**
(45) **Date of Patent: Aug. 4, 2015**

(54) **METHOD FOR IN-VIVO BINDING OF CHROMATIN FRAGMENTS**

(75) Inventors: **Indraneel Mittra**, New Delhi (IN); **Rekha Mannemcherril Ramesan**, Kerala (IN); **Chandra Prakash Sharma**, Kerala (IN); **Gopichettipalayam Subbaratnam Bhuvaneshwar**, Kerala (IN); **Kavita Anirban Pal**, Nagpur (IN)

(73) Assignee: **TATA MEMORIAL CENTRE**, Parel, Mumbai (IN)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(52) **U.S. Cl.**
CPC ***C07K 16/08*** (2013.01); ***A61K 47/4823*** (2013.01); *A61K 2039/505* (2013.01)

(58) **Field of Classification Search**
CPC C07K 16/303
See application file for complete search history.

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(74) *Attorney, Agent, or Firm* — Pillsbury Winthrop Shaw Pittman LLP

(57) **ABSTRACT**

A process for substantially reducing levels of circulating chromatin fragments (CCFs) from a medium using binding agents such as antibodies or antibodies complexed with haemocompatible natural polymer substrates like as alginates, chitosan and pullulan to form complexed antibody-substrate nano-particulates (CNP) to bind and/or inactivate CCFs is disclosed. The amount of antibody bound to the polymer varies from 30% to 100% of activated sites in the polymer. Elevated levels of CCFs can be substantially reduced following administration of tissue damaging agents that generate apoptotic chromatin fragments by the concomitant administration of CNPs or concomitant administration of H4 antibody alone. A method of treatment is disclosed wherein therapeutic dose of CNPs, or H4 antibody alone, are administered systematically, or orally, in a delivery system to curb pathological conditions that are associated with increased burden of circulating chromatin fragments.

13 Claims, 11 Drawing Sheets

Full Text

Print this page

US 9,096,655 B2

METHOD FOR IN-VIVO BINDING OF CHROMATIN FRAGMENTS

Indraneel Mittra, New Delhi (IN); Rekha Mannemcherril Ramesan, Kerala (IN); Chandra Prakash Sharma, Kerala (IN); Gopichettipalayam Subbaratnam Bhuvaneshwar, Kerala (IN); and Kavita Anirban Pal, Nagpur (IN)

Assigned to TATA MEMORIAL CENTRE, Parel, Mumbai (IN)

Appl. No. 13/575,756

Filed by Indraneel Mittra, New Delhi (IN); Rekha Mannemcherril Ramesan, Kerala (IN); Chandra Prakash Sharma, Kerala (IN); Gopichettipalayam Subbaratnam Bhuvaneshwar, Kerala (IN); and Kavita Anirban Pal, Nagpur (IN)

PCT Filed Jan. 24, 2011, PCT No. PCT/IN2011/000052

§ 371(c)(1), (2), (4) Date Jul. 27, 2012,

PCT Pub. No. WO2011/092715, PCT Pub. Date Aug. 4, 2011.

Claims priority of application No. 212/MUM/2010 (IN), filed on Jan. 27, 2010.

Prior Publication US 2012/0301487 A1, Nov. 29, 2012

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CPC *C07K 16/08* (2013.01) [*A61K 47/4823* (2013.01); *A61K 2039/505* (2013.01)]

13 Claims

1. A method for substantially reducing levels of circulating chromatin fragments (CCFs) from a medium of a mammal in need thereof, comprising introducing into the medium a nanoparticle comprising (a) a polymer having a selective affinity to liver of said mammal, and (b) an antibody that binds CCFs, wherein the antibody is covalently bound to the polymer.

Achievements

✓ **Method for ex-vivo separation of apoptotic chromatin fragments from blood or plasma for preventic treatment of diverse human diseases.**

Inventors : Mittra I, Samant UC, Modi GK, Mishra PK, Bhuvaneshwar

Application No : 14/100, 950

Publication No. US 2014/0099293 A1

✓**Markers for transformed epithelium and potential targets for therapy of cancer of the gingivo buccal cc**

European Patent Specification No. EP 2 115 473 B1

Date of publication : 04/06/2014

(ii) **Auto antibodies for protein antigens as markers for cancer of gingivo-buccal complex.**

United States Patent No. US8 492 100 B2

Date of publication : 23/07/2013

From: Sanjay Gupta/ACTREC
To: Academic Office/ACTREC@ACTREC
Cc: Mushtaq Shaikh/ACTREC@ACTREC
Details are as follows:
Monoclonal antibody targeting Lipocalin 2 for therapeutic usage in cancer overexpressing LCN2: KSA REF : PS1295IN00. || K&S Ref: IP46404

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1	E-2/543/2017/MUM	201621009168	24000	6402	Full	

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CBR Detail:

Sr. No.	Ref. No./Application No.	App. Number	Amount Paid	C.B.R. No.	Form Name	Remarks
1	4082/MUM/2015		8000	16722	FORM 1	PHOTO-DISINTEGRABLE, NEAR-INFRA RED RESPONSIVE GOLD COATED POLY-(LACTIC-CO-GLYCOLIC ACID) NANOSTRUCT

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[See Rule 22(1)]
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Adastra IP 2054, Sector 8

CBR Detail:

Sr. No.	Ref. No./Application No.	App. Number	Amount Paid	CBR No.	Form Name	Remarks
1	201921010208	TEMP/E-1/10868/2019-MUM	32800	6231	FORM 1	A METHOD FOR DETECTION OF PROTEIN ACTIVATION USING PHOSPHO-BRET IMAGING SENSOR AND METHODS THEREOF

TransactionID	Payment Mode	Challan Identification Number	Amount Paid	Head of A/C No
N-0000482921	Online Bank Transfer	1503190005393	32800.00	1475001020000001

Total Amount : ₹ 32800
Amount in Words: Rupees Thirty Two Thousand Eight Hundred Only

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US010054602B2

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

(10) **Patent No.: US 10,054,602 B2**
(45) **Date of Patent: Aug. 21, 2018**

(54) **CONJUGATE OF ESTRADIOL AND APPLICATIONS THEREOF**

(71) Applicant: **CHRIST UNIVERSITY**, Bengaluru, Kamataka (IN)

(72) Inventors: **Iven Jose**, Bangalore (IN); **Shubhada V. Chiplunkar**, Navi Mumbai (IN); **Vinay Jha Pillai**, Bengaluru (IN); **Rahul Verma**, Gurgaon (IN)

(73) Assignee: **CHRIST UNIVERSITY**, Bengaluru (IN)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 13 days.

(21) Appl. No.: **15/682,047**

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C07H 1/00	(2006.01)
C09K 11/06	(2006.01)
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(58) **Field of Classification Search**

None

See application file for complete search history.

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Primary Examiner — Jean P Cornet

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(57) **ABSTRACT**

The present invention relates to conjugate of 17-β estradiol with an analog of indocyanine green dye for the detection of cancers. The invention also provides a method of preparation of the conjugate and method of detection of cancer cells.

6 Claims, 7 Drawing Sheets