

# JAI NARAIN VYAS UNIVERSITY JODHPUR



**2016 - 2021**

3.4.3 Number of Patents published / awarded during the last five years.



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SARASWAT, Sushil Kumar  
Indian Institute Of Technology Delhi (Delhi)  
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New Delhi 110 016

Date

11.01.16

Reference	Application No./Patent No. 13814642.8 - 1352
Applicant/Proprietor Hindustan Petroleum Corporation Ltd., et al	

#### Notification of the data mentioned in Rule 19(3) EPC

In the above-identified patent application you are designated as inventor/co-inventor.  
Pursuant to Rule 19(3) EPC the following data are notified herewith:

DATE OF FILING : 23.07.13

PRIORITY : IN/24.05.13/ INA MM18522013

TITLE : CATALYTIC DECOMPOSITION OF LOWER HYDROCARBONS  
TO PRODUCE CARBON OXIDES FREE HYDROGEN AND  
BAMBOO SHAPED CARBON NANOTUBES

DESIGNATED STATES : AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE  
IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM  
TR

For the Examining Division





**INTELLECTUAL  
PROPERTY INDIA**

PATENT, TRADE MARKS & DESIGNS ACT, 1999  
(CENTRAL PROTECTION)



सत्यमेव जयते

भारत सरकार  
GOVERNMENT OF INDIA

पेटेंट कार्यालय  
THE PATENT OFFICE

पेटेंट प्रमाणपत्र  
PATENT CERTIFICATE  
(Form 74 of The Patents Rules)

फॉर्म  
Sl. No. 011105880



पेटेंट नं. / Patent No.	204000
आवेदन नं. / Application No.	410/DEL/2011
प्रकाश करने की तारीख / Date of Filing	17/02/2011
पेटेंटी / Patentee	1. BHARMA, Poojash Kumar 2. BHANDARI And

प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में उद्घाटित METHOD AND APPARATUS FOR REMOVAL AND BIODEGRADATION OF ENGINE OIL FROM CONTAMINATED WATER BODIES नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख 17th day of February 2011 से बीस वर्ष की अवधि के लिए पेटेंट अनुदान किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled METHOD AND APPARATUS FOR REMOVAL AND BIODEGRADATION OF ENGINE OIL FROM CONTAMINATED WATER BODIES as disclosed in the above mentioned application for the term of 20 years from the 17th day of February 2011 in accordance with the provisions of the Patents Act, 1970.

**INTELLECTUAL  
PROPERTY INDIA**  
PATENTS / DESIGNS / TRADE MARKS  
GEOGRAPHICAL INDICATION



अवकाश की तारीख 20/03/2018  
Date of expiry

डिप्टी डायरेक्टर  
Deputy Director of Patents

नोट - इस पेटेंट की अवधि के अंतर्गत, यह इसे बनाए रखा जायेगा, 17th day of February 2011 से और फिर इसके बाद से 20 वर्ष के लिए।  
Note - This term for renewal of this patent, it is to be maintained will till 17th day of February 2011 and on the same day in every year thereafter.





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PROPERTY INDIA**

PATENTS | DESIGNS | TRADE MARKS  
GEOGRAPHICAL INDICATIONS



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**पेटेंट कार्यालय  
THE PATENT OFFICE**

**पेटेंट प्रमाणपत्र  
PATENT CERTIFICATE**  
(Rule 74 Of The Patents Rules)

क्रमांक : 011139915  
SL No :



पेटेंट सं. / Patent No. : 380374  
आवेदन सं. / Application No. : 780/DEL/2011  
फाइल करने की तारीख / Date of Filing : 21/03/2011  
पेटेंटी / Patentee : 1.VEERMA RAM 2.ANIL BHANDARI 3.SANJAY SHARMA  
4.TARUN JAIN and 5.RATENDRA KUMAR

प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में यथाप्रकटित ANTI DIABETIC COMPOSITION OF FRACTIONS OF THE FRESH COW URINE AND PROCESS FOR THE SAME नामक आविष्कार के लिए, पेटेंट अधिनियम, १९७० के उपबंधों के अनुसार आज तारीख 21st day of March 2011 से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled ANTI DIABETIC COMPOSITION OF FRACTIONS OF THE FRESH COW URINE AND PROCESS FOR THE SAME as disclosed in the above mentioned application for the term of 20 years from the 21st day of March 2011 in accordance with the provisions of the Patents Act, 1970.



अनुदान की तारीख : 27/10/2021  
Date of Grant :

पेटेंट नियंत्रक  
Controller of Patent

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, 21st day of March 2013 को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।

Note - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 21st day of March 2013 and on the same day in every year thereafter.





सत्यमेव जयते

क्रमांक : 011115258  
SL No :



भारत सरकार  
GOVERNMENT OF INDIA  
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THE PATENT OFFICE  
पेटेंट प्रमाणपत्र  
PATENT CERTIFICATE  
(Rule 74 Of The Patents Rules)

पेटेंट सं. / Patent No. : 317949  
आवेदन सं. / Application No. : 415/DEL/2011  
फाइल करने की तारीख / Date of Filing : 17/02/2011  
पेटेंटी / Patentee : 1.SHARMA Peeyush Kumar 2.BHANDARI Anil

प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में यथाप्रकटित DESIGNING OF AN IN SITU BIO-FILM DEVELOPMENT AND BIOREMEDIATION APPARATUS FOR THE TREATMENT OF HYDROCARBON CONTAMINATED WATERS नामक आविष्कार के लिए, पेटेंट अधिनियम, १९७० के उपबंधों के अनुसार आज तारीख 17th day of February 2011 से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled DESIGNING OF AN IN SITU BIO-FILM DEVELOPMENT AND BIOREMEDIATION APPARATUS FOR THE TREATMENT OF HYDROCARBON CONTAMINATED WATERS as disclosed in the above mentioned application for the term of 20 years from the 17th day of February 2011 in accordance with the provisions of the Patents Act, 1970.



अनुदान की तारीख : 08/08/2019  
Date of Grant :

पेटेंट नियंत्रक  
Controller of Patent

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, 17th day of February 2013 को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।  
Note. - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 17th day of February 2013 and on the same day in every year thereafter.





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PATENT CERTIFICATE  
(Rule 74 Of The Patents Rules)

क्रमांक : 011105680  
SL No :



पेटेंट सं. / Patent No. : 294099  
आवेदन सं. / Application No. : 416/DEL/2011  
फाइल करने की तारीख / Date of Filing : 17/02/2011  
पेटेंटी / Patentee : 1.SHARMA Peeyush Kumar 2.BHANDARI Anil

प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में यथाप्रकटित METHOD AND APPARATUS FOR REMOVAL AND BIODEGRADATION OF ENGINE OIL FROM CONTAMINATED WATER BODIES नामक आविष्कार के लिए, पेटेंट अधिनियम, १९७० के उपबंधों के अनुसार आज तारीख 17th day of February 2011 से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled METHOD AND APPARATUS FOR REMOVAL AND BIODEGRADATION OF ENGINE OIL FROM CONTAMINATED WATER BODIES as disclosed in the above mentioned application for the term of 20 years from the 17th day of February 2011 in accordance with the provisions of the Patents Act, 1970.



अनुदान की तारीख : 09/03/2018  
Date of Grant :

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, 17th day of February 2013 को और उसके बाद हर वर्ष

Note: - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 17th day of February 2013 and on the same day in every year thereafter.





## (51) International Patent Classification:

B01J 37/03 (2006.01) B01J 37/02 (2006.01)  
B01J 21/04 (2006.01) B82Y 40/00 (2011.01)  
B01J 23/80 (2006.01)

## (21) International Application Number:

PCT/IN2013/000460

## (22) International Filing Date:

23 July 2013 (23.07.2013)

## (25) Filing Language:

English

## (26) Publication Language:

English

## (30) Priority Data:

1852/MUM/2013 24 May 2013 (24.05.2013) IN

(71) Applicants: **HINDUSTAN PETROLEUM CORPORATION LTD.** [IN/IN]; Petroleum House, 17 Jamshedji Tata Road, Churchgate, Mumbai 400 020 (IN). **INDIAN INSTITUTE OF TECHNOLOGY, DELHI** [IN/IN]; Hauz Khas, New Delhi 110 016 (IN). **CENTRE FOR HIGH TECHNOLOGY** [IN/IN]; OADB Bhawan, Tower 'A', 9th Floor, Plot No. 2, Sector- 73, Noida 201 301 (IN).

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(74) Agents: **RAE, Konpal et al.**; B-6/10, Safdarjung Enclave, New Delhi 110 029 (IN).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, 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, 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, PA, 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.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

## Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

## Published:

— with international search report (Art. 21(3))

(54) Title: CATALYTIC DECOMPOSITION OF LOWER HYDROCARBONS TO PRODUCE CARBON OXIDES FREE HYDROGEN AND BAMBOO SHAPED CARBON NANOTUBES

(57) Abstract: In accordance with the present subject matter there is provided a process for catalytic decomposition of lower hydrocarbons to produce carbon oxides free hydrogen and bamboo shaped carbon nanotubes over a catalyst composition. The process for catalytic decomposition of lower hydrocarbons comprises contacting lower hydrocarbon over a catalyst composition, where the catalyst composition comprising, a catalyst, at least one modifying agent and a support material.



WO 2014/188439 A1



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De Vries & Metman  
Overschiestraat 180  
1062 XK Amsterdam  
PAYS-BAS

Date

16.03.16

Reference EP23421-HS/pb	Application No./Patent No. 13814642.8 - 1370 / 3003552
Applicant/Proprietor Hindustan Petroleum Corporation Ltd., et al	

**Communication of European publication number and information on the application of Article 67(3) EPC**

The provisional protection under Article 67(1) and (2) EPC in the individual Contracting States becomes effective only when the conditions referred to in Article 67(3) EPC have been fulfilled (for further details, see information brochure of the European Patent Office "National Law relating to the EPC" and additional information in the Official Journal of the European Patent Office).

Pursuant to Article 153(3) EPC the publication under Article 21 PCT of an international application for which the European Patent Office is a designated or elected Office takes the place of the publication of a European patent application.

The bibliographic data of the above-mentioned Euro-PCT application will be published on 13.04.16 in Section I.1 of the European Patent Bulletin. The European publication number is 3003552.

In all future communications to the European Patent Office, please quote the application number plus Directorate number.

**For the Examining Division**



(12) PATENT APPLICATION PUBLICATION

(21) Application No.202111021500 A

(19) INDIA

(22) Date of filing of Application :12/05/2021

(43) Publication Date : 21/05/2021

(54) Title of the invention : WOUND HEALING TOPICAL PHARMACEUTICAL COMPOSITION

(51) International classification	:A61K0009000000, A61K0047100000, A61K0009060000, A61K0047140000, A61K0047320000	(71) <b>Name of Applicant :</b> <b>1)Vishnu Dutt JOSHI</b> Address of Applicant :House No. 357, Sector 9, Chopasni Housing Board, Nandanvan, Jodhpur, Rajasthan, India, 342008 Rajasthan India
(31) Priority Document No	:NA	<b>2)Ashish JOSHI</b>
(32) Priority Date	:NA	<b>3)Peeyush Kumar SHARMA</b>
(33) Name of priority country	:NA	<b>4)Anil BHANDARI</b>
(86) International Application No	:NA	(72) <b>Name of Inventor :</b>
Filing Date	:NA	<b>1)Vishnu Dutt JOSHI</b>
(87) International Publication No	: NA	<b>2)Ashish JOSHI</b>
(61) Patent of Addition to Application Number	:NA	<b>3)Peeyush Kumar SHARMA</b>
Filing Date	:NA	<b>4)Anil BHANDARI</b>
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

The present invention relates to a topical antioxidant pharmaceutical composition and the method of preparation thereof. Topical antioxidant pharmaceutical composition is effective for treating and healing incision wound. Pharmaceutical composition is used for topical application for the treatment of ailments like: submucosal fibrosis, traumatic ulcers, stomatitis glositis and anal fissures.

No. of Pages : 39 No. of Claims : 16



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## Patent Search

Invention Title	CATALYTIC DECOMPOSITION OF LOWER HYDROCARBONS TO PRODUCE CARBON OXIDES FREE HYDROGEN AND BAMBOO SHAPED CA NANOTUBES
Publication Number	36/2016
Publication Date	31/08/2016
Publication Type	INA
Application Number	1852/MUM/2013
Application Filing Date	24/05/2013
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	CHEMICAL
Classification (IPC)	C01B 31/02,B01J 23/88

### Inventor

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RAO, Peddy Venkata Chalapathi	HINDUSTAN PETROLEUM CORPORATION LTD., HPCL CORPORATE R&D CENTRE, 1ST FLOOR, ADARSH ECO PLACE, 176 EPIP KUNDENAHALLI HOBLI, WHITEFIELD, BANGALORE- 560 066	India
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GANESH, Gandham Sri	HINDUSTAN PETROLEUM CORPORATION LTD., HPCL CORPORATE R&D CENTRE, 1ST FLOOR, ADARSH ECO PLACE, 176 EPIP KUNDENAHALLI HOBLI, WHITEFIELD, BANGALORE- 560 066	India
PEDDY, VENKATA CHALAPATHI RAO	HINDUSTAN PETROLEUM CORPORATION LTD., HPCL CORPORATE R&D CENTRE, 1ST FLOOR, ADARSH ECO PLACE, 176 EPIP KUNDENAHALLI HOBLI, WHITEFIELD, BANGALORE- 560 066 INDIA	India
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### Applicant

Name	Address	Country
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INDIAN INSTITUTE OF TECHNOLOGY, DELHI	INDIAN INSTITUTE OF TECHNOLOGY DELHI (IIT DELHI), HAUZ KHAS, NEW DELHI- 110 016	India
CENTRE FOR HIGH TECHNOLOGY	CENTRE FOR HIGH TECHNOLOGY (CHT), OI DB BHAWAN, TOWER 'A', 9TH FLOOR, PLOT NO. 2, SECTOR- 73, NOIDA, Uttar Pradesh 201301	India

### Abstract:

In accordance with the present subject matter there is provided a process for catalytic decomposition of lower hydrocarbons to produce carbon oxides free hydroger bamboo shaped carbon nanotubes over a catalyst composition. The process for catalytic decomposition of lower hydrocarbons comprises contacting lower hydrocar catalyst composition, where the catalyst composition comprising, a catalyst, at least one modifying agent and a support material. .

Complete Specification

FORM 2

THE PATENTS ACT, 1970 (39 of 1970) &amp; THE PATENTS RULES, 2003

COMPLETE SPECIFICATION

(See section 10, rule 13)

1. Title of the invention: CATALYTIC DECOMPOSITION OF LOWER HYDROCARBONS  
TO PRODUCE CARBON OXIDES FREE HYDROGEN AND BAMBOO SHAPED CARBON NANOTUBES

2. Applicant(s)

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Page last updated on: 26/06/2019





Australian Government

IP Australia

# CERTIFICATE OF GRANT INNOVATION PATENT

**Patent number:** 2021106619

The Commissioner of Patents has granted the above patent on 17 November 2021, and certifies that the below particulars have been registered in the Register of Patents.

**Name and address of patentee(s):**

Gaurav Indra of Assistant Professor, Department of Information Technology, Indira Gandhi Delhi Technical University, Kashmere Gate New Delhi India

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S N Panda of Professor, Department of Chemistry, Vikash Degree College, Bargarh Odisha 768028 India

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**Title of invention:**

INTELLIGENT SYSTEM FOR POLLUTION MANAGEMENT TO MONITOR POLLUTANTS RELEASED INTO THE AIR FROM INDUSTRIES USING IOT

**Name of inventor(s):**



Dated this 17<sup>th</sup> day of November 2021

Commissioner of Patents

**PATENTS ACT 1990**

The Australian Patents Register is the official record and should be referred to for the full details of this IP Right

Application Details

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TITLE OF INVENTION	DESIGN AND DEVELOPMENT OF SOIL INSPECTION ROBOT FOR AGRICULTURAL FIELDS
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### **Title of Invention "AFFINITY BIOSENSOR FOR DOPAMINE"**

#### **Abstract**

A novel process for the development of a biosensing method having a receptor protein as sensing element for a Surface Plasmon Resonance SPR based affinity biosensor for detection of dopamine DA comprising the incubation of receptor D-RC in the concentration range of 20-30 ug/ml, with DA in the concentration range 0.1 ng/ml -700 ng/ml, followed by injection over DA-BSA conjugate and duration of injection in the range of 3 to 7 minutes preferably 5 minutes leading to a shift of resonance angle by 0.020° to 0.040°, the decreases in the resonance angle shift being in proportion to the concentration of DA; the sensor surfaces being fabricated by physical adsorption of the conjugates on to the transducer surfaces, a microscopic glass slide coated with a ~5 nm layer of chromium and ~ 50nm layer of gold serving as transducer surface attached to the prism of the surface plasmon resonance instrument, wherein the sensor surface is functionalized with a protein conjugate of dopamine and bovine serum albumin with phosphate buffered saline (PBS) 0.1M, pH 7.2 as carrier solution.

#### **Field of Invention:**

This invention relates to the development of a D 3 dopamine receptor based, sensing element for a "surface plasmon resonance" based affinity biosensor for highly sensitive and selective detection of dopamine.

#### **Background of the Invention;**

Dopamine is a substance of prime importance for optimal regulation of human nervous system. In the biomedical field, to detect the presence and to monitor the level of dopamine is of immense importance for the clinicians to identify the CNS related disorders as well as to decide the dose estimation of external supplement. Various analytical methods including HPLC, capillary electrophoresis, fluorescence and amperometry have been demonstrated for detection of dopamine. Reviewing the wide number of reports, it can be realized that the selective detection of dopamine remains a challenge because of the presence of large excess of ascorbic acid, uric acid and other analogous endogenous compounds with dopamine in biological samples, which limits their application to invivo analysis. Moreover, they often involve time consuming and complicated procedures. Various strategies have been employed in electrochemical based sensors for alleviation of this selectivity problem such as, coupling with chromatographic separation, surface pretreatment and using perm-selective membranes. However the problem of selective detection of dopamine remains unsolved.

#### **Full Text**

Biosensors are analytical devices comprising a biological or biologically derived sensing element immobilized at a physicochemical transducer to measure one or more analytes. The sensing element could be enzymes, microorganism, tissue slices, biomimetic catalysts, antibodies, nucleic acids, receptor proteins or synthetic receptors.

In contrast to the most common enzyme based biosensors, the affinity based

biosensing element (antibodies, receptors) do not usually catalyze chemical transformations and rather undergo a physical transformation while interacting with corresponding antigen/ligand which can be detected by physical transducer. Most advanced Surface Plasmon Resonance (SPR) based optical transducers are now well established technology capable of monitoring antibody-antigen based immuno-reactions or receptor-ligand based affinity reactions. The binding between immobilized receptor and ligand changes the refractive index, leading to the change in SPR angle, which can be monitored in real time. The magnitude of the change in SPR signal is directly proportional to the mass bound to the surface even at nanogram levels.

It is necessary to develop an appropriate biosensor which can measure dopamine independent of presence of antibodies against it, as antibody production is a reaction phenomenon of body in response to entrance/presence of antigen.

There is no biosensor yet developed to measure the presence of dopamine *invivo* or *invitro* conditions.

#### Objects of the Invention;

The object of this invention is to develop a receptor based affinity biosensor for highly selective and sensitive detection of dopamine.

Other objective is to develop a sensor capable of performing *invivo* estimation of dopamine without prior separation in medical diagnostics.

Another object of this invention is to use Surface Plasmon Resonance based optical transducer for dopamine sensing.

Yet another object is to use receptor for developing biosensor which is a natural target for analyte as they possess high affinity and specificity refined by evolutionary process.

Other object of this invention is to avoid the use of antibody as recognizing element which involves challenging the experimental animals.

Another object is to develop the stability of receptor subunits by using immobilization conditions that closely related to natural environment.

Yet another object is to develop a multiple analysis system of hundreds of binding events from very small sample volumes.

#### Detailed Description of the Invention;

The principle of the invention is that a biosensor to sense qualitative and quantitative presence of dopamine *invitro* and *invivo* can be developed using receptors instead of antibodies.

Inventors have established here receptor based sensing element for a SPR based affinity biosensor for highly sensitive and selective detection of dopamine (DA), employing a D3 dopamine receptor and a home made DA-bo vine serum albumin (DA-BSA) conjugate.

The new methodology presented here using receptor as a recognition element for dopamine detection based on Surface Plasmon Resonance (SPR) technique proved to be a potential tool for highly sensitive and selective detection of dopamine with good reliability and reproducibility. The sensing idea is simple and the high affinity molecular recognition of the dopamine receptor (D-RC) provided remarkable specificity for dopamine (DA) against ascorbic acid (AA), uric acid (UA) and other dopamine analogues viz., 3,4 dihydroxyphenyl acetic acid (DOPAC) and 3-(3,4 dihydroxyphenyl)-alanine (DOPA). The proposed method provides a new and promising route for reliable and economic biochemical diagnosis of risk of dopamine



related disorders.

The sensor surfaces were fabricated by physical adsorption of the conjugates (analyte-carrier protein) onto the transducer surfaces. A microscopic glass slide coated with a ~5 nm layer of chromium and ~50 nm layer of gold served as transducer surface and was attached to the prism of the surface plasmon resonance instrument (Model SPR-670, Nippon Laser and Electronics, Japan). The sensor surface was

functionalized with a protein conjugate of dopamine and bovine serum albumin (BSA). Phosphate buffered saline (PBS, 0.1 M, pH 7.2) was used as the carrier solution. A pepsin solution, glycine-HCl buffer, pH 2 was used for regeneration of sensor surface.

The sensitive and selective interactions of the dopamine receptors (D-RC) with dopamine-bovine serum albumin conjugate (DA-BSA) were monitored using SPR technique. Detection of dopamine (DA) was carried out using the principle of indirect competitive inhibition, which is a promising protocol for sensitive detection of small molecules in techniques like SPR where molecular interaction is being observed. The developed affinity biosensor is remarkably sensitive showing, detection limit 85 pg/ml (ppt, parts per trillion) and highly selective with a response time of 5 minutes. Monitoring dopamine concentration through present "Affinity Sensor" technique will be helpful as an early marker rather than as a diagnosis of CNS-related disorders. The two main novelties lie in the use of SPR as optical transducer and the use of a natural receptor as bio-recognizing element in the development of affinity biosensor for dopamine.

We Claim;

1. A novel process for the development of a biosensing method having a receptor protein as sensing element for a Surface Plasmon Resonance SPR based affinity biosensor for detection of dopamine DA comprising the incubation of receptor D-RC in the concentration range of 20-30 ug/ml, with DA in the concentration range 0.1 ng/ml -700 ng/ml, followed by injection over DA-BSA conjugate and duration of injection in the range of 3 to 7 minutes preferably 5 minutes leading to a shift of resonance angle by  $0.020^{\circ}$  to  $0.040^{\circ}$ , the decreases in the resonance angle shift being in proportion to the concentration of DA; the sensor surfaces being fabricated by physical adsorption of the conjugates on to the transducer surfaces, a microscopic glass slide coated with a ~5 nm layer of chromium and ~50 nm layer of gold serving as transducer surface attached to the prism of the surface plasmon resonance instrument, wherein the sensor surface is functionalized with a protein conjugate of dopamine and bovine serum albumin with phosphate buffered saline (PBS) 0.1M, pH 7.2 as carrier solution.
2. A novel process for the development of a biosensing method as claimed in claim 1, wherein the immobilised assay format could be reused by simple regeneration of its original state by injecting 2-10 jig/ml pepsin solution (glycine-HCl buffer, pH 2.0) for 10-60 s.
3. The novel process for the development of bio sensing method as claimed in claim 1 wherein the biosensor is providing remarkable sensitivity with a detection limit of 85 pg/ml and a response time of 5 minutes.
4. The process for the development of a biosensing method as claimed in claim 1, wherein the sensing idea is simple and the

high affinity molecular recognition of the D-RC provided remarkable specificity for DA against interference from coexisting compounds such as ascorbic acid, uric acid and other DA analogues.

5. The process for the development of a biosensing method as claimed in claim 1 wherein almost similar resonance angle shift for the interaction of D-RC with DA-BSA conjugate is detected after multiple analysis cycles to be reused for nearly 20 cycles of measurements.

6. The process for the development of a biosensing method as claimed in claim 1, wherein monitoring dopamine concentration is used as an early marker rather than diagnosis.

7. The process for the development of a biosensing method as claimed in claim 1, wherein affinity interaction based biosensor is used for the first time for dopamine detection using receptor as the bio recognition element.

8. The process for the development of a biosensing method as claimed in claim 1, wherein the SPR is used for the first time as physical transducer for sensing dopamine.

## Documents:

<http://ipindiaonline.gov.in/patentsearch/GrantedSearch/viewdoc.aspx?id=GuleQKMEJIFV2It0xDDiGg==&loc=+mN2fYxnTC4l0fUd8W4CAA==>

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