Statement of Research Achievements on which Awards have been received

Prof. Singh developed a recombinant DNA technology for the cloning a novel antigen for the rapid diagnosis of visceral leishmaniasis from the Indian isolate of Leishmania donovani, isolated by him from a Bihar patient. The novel antigen preparation was patented and transferred to M/s Span Diagnostics, Surat which prepared diagnostic kit and commercialised these in various formats, including the ELISA, Flow through and finally lateral Flow Immunochromatographic Rapid Test format. For this work he has received several recognitions and made several publications, as outlined in his biodata. Some of these recognitions and awards are Biotechnology Product, Process and Commercialization Award for Commercialization of the above innovation from Department of Biotechnology (DBT) in 2006. For the same innovation and improvement in its technology platform other recognitions he got, include: Vigyan Ratna Samman, Council of Science and technology, Government of UP, 2006; Dr. BC Roy Award (Hari Om Ashram Alembic Research Award), Medical Council of India, 2007; Prof. BK Aikat Oration Award, Indian Council of Medical Research, 2008; Chikitsa Ratna Award, Delhi Medical Association, 2014 and BMJ (India) Excellence Award, 2014.

However, citation of only ICMR and BMJ are available which are reproduced below.

PROF. B.K.AIKAT ORATION AWARD

DR SARMAN SINGH

Subject :

Year : 2008

Address

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The Professor B. K. Aikat Oration Award was instituted by Dr Meera Aikat in 1984 in memory of her husband Prof. B.K. Aikat, a biomedical scientist. This award is conferred upon a scientist for the research work carried out in the field of Tropical Diseases. The Award for the year 2008 is being presented to Dr Sarman Singh, Prof. & Head of Clinical Microbiology, Department of Laboratory Medicine, All India Institute of Medical Sciences, New Delhi for his research work on 'Kala-azar'. Dr Sarman Singh has made outstanding contributions in the field of kalaazar also known as visceral leishmaniasis during the past two decades. He has done extensive research work on pathogenesis, diagnosis, vaccine development and epidemiology of leishmaniasis. Using molecular techniques, Dr Singh was perhaps the first to report that strains of Leishmania donovani causing visceral disease are genetically different from strains causing post-kala-azar dermal leishmaniasis. His significant contribution included the preparation of a novel recombinant antigen LdrKE16 and development of an indigenous rapid diagnostic test for the diagnosis of leishmaniasis. This invention has been commercialized at an affordable price in India and other countries. Dr Singh has also devised serologic diagnostic criteria for HIV-leishmania co-infected patients and has carried out community-based studies on SAG injection associated transmission of blood borne infections in Bihar, that led to enforcement of safe injection measures by global network of WHO. Dr Singh has also obtained two USA patents and is currently focusing on chimeric DNA vaccine for combating leishmaniasis. Prof. Singh has received Dr B.C. Roy Award of Medical Council of India, Vigyan Ratan Samman of UP Government, Biotech Product Process and Commercialization Award of DBT, BP Pandey Oration award of Indian Society of Parasitology and Young Scientist Award of International Immuncompromised Host Society (USA). He has published more than 200 research papers in national and international journals.

Judging the best of Indian healthcare

Nominations have now closed, and judging has begun, for the first BMJ Awards India, which will be presented on 20 September 2014 in New Delhi. Jeetha D'Silva reports

Jeetha D'Silva *journalist, Mumbai*

"We received an overwhelming number of nominations," said Anand Ekambaram, managing director of BMJ India. More than 500 individuals and teams throughout India have been put forward.[1]

"The BMJ India Awards are a very prestigious recognition, and it is an honour to be among the nominees," said Sarman Singh, professor and head of the division of clinical microbiology and molecular medicine at the All India Institute of Medical Sciences in New Delhi. He thinks that the awards indicate the progress that Indian healthcare has made. "We have also seen an increase in the acceptance rate of research papers from India in leading medical publications across the world," he said.

An easy test for leishmaniasis

Singh had been nominated in the Innovation in Healthcare Technology category for developing a high quality and cost effective diagnostic test for visceral leishmaniasis, a neglected tropical disease that kills around 50 000 people a year worldwide.[2]

Current best practice for diagnosing leishmaniasis is microscopic detection of the parasite. However, taking samples from the lymph node, bone marrow, or spleen aspirate requires expertise and is potentially dangerous and so cannot be done everywhere. Singh's work forms the basis for simple blood tests now in use to detect antibodies produced after infection.[3] The World Health Organization says that these tests, which cost about Rs 40 (£0.40; €0.50; $0.66), are the best diagnostic tool for remote places.[2]

management of multidrug resistant tuberculosis (MDR TB) through "virtual consultancy."

In the standard protocol of the government-run tuberculosis control programme, patients are given antituberculosis drugs under direct observation of the healthcare provider—that is, "directly observed treatment, short course" (DOTS).[3] Kerala has only two "DOTS plus" centres, which can also test for drug susceptibility for the management of MDR TB. This means that many patients have to travel long distances.

"Asking patients with MDR TB to report to the government centre at regular intervals is illogical and poses a high risk of transmission to the community as most of these patients use public transport," explained George. To curtail the spread of the MDR TB bacilli in the community, George and his team set up a virtual consultancy in 2009. They trained doctors from peripheral towns to manage patients, while George and his team monitored treatment and follow-up remotely.

"The Kozhikode model has shown a success rate of 68.2%, which is at par with the success of standard of care reported for drug resistant tuberculosis in the literature," he added. This project is now being considered for wider implementation at DOTS plus centres throughout the country, George said.

Healthcare for remote tribes

The Jawadhi Hills Health and Development Project, which has been shortlisted in the Primary Healthcare under Challenging Circumstances category, is another initiative that is striving to


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AWARD CATEGORIES

INNOVATION IN HEALTHCARE TECHNOLOGY

FINALISTS

FINALISTS

- Bhattacharjee pupil expansion ring, Kolkata (Suven Bhattacharjee)
- Novel rapid test kits for visceral leishmaniasis, All India Institute of Medical Sciences, New Delhi (Dr. Suman Singh)
- A novel intraosseous device for emergency vascular access, Stanford-India Biodesign Center, All India Institute of Medical Sciences, New Delhi (Dr. Sandeep Singh)

This award was established to honor teams or programs of excellence that have delivered new value to improve the experience and outcomes of patients. This category was constituted to enable recognition to an innovation that used new processes or technology or used existing ones in novel ways across new medical devices, diagnostic techniques, new care pathways, the use of informatics or imaging or collaborations that raise standards of care. Our expert panel of judges evaluated nominations received on initiatives that had patient centered outcome measures and successful adoption and uptake of the innovation by a wider group.

This category had two winners—one went to a team represented by Dr. Sandeep Singh, of the Stanford India Biodesign Center at Delhi's All India Institute of Medical Sciences (AIIMS). It had invented a low-cost intraosseous device for emergency access to the adult circulatory system when peripheral intravenous access is impossible, which now has funding for a clinical trial.

Dr. Suman Singh, head of the division of medical microbiology and molecular medicine at AIIMS, received the other award in this category for inventing a quick and accurate test for visceral leishmaniasis that costs only 40 rupees, which is based on a recombinant antigen from Leishmania donovani. The health ministry recently pledged eradication of the disease by 2015, and the jury panel was impressed that the government plans to use this test in its National Vector Borne Disease Control Programme.

Winners

Winners: Novel rapid test kits for visceral leishmaniasis, AIIMS, New Delhi (Dr. Suman Singh); and A novel intraosseous device for emergency vascular access, Stanford-India Biodesign Center, AIIMS, New Delhi (Dr. Sandeep Singh). Pictured is Dr. Ajay Kumar Bhargava, Executive Director Stanford-India Biodesign and Professor, Department of Cardiology, Cardiothoracic Sciences Centre, AIIMS, Delhi.

US007740859B2

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

(10) **Patent No.: US 7,740,859 B2**
(45) **Date of Patent: Jun. 22, 2010**

(54) **POLYPEPTIDES FOR THE DIAGNOSIS AND THERAPY OF LEISHAMANIASIS**

(75) Inventors: **Sarman Singh**, New Delhi (IN); **Ramu Sivakumar**, New Delhi (IN)

(73) Assignees: **All India Institute of Medical Sciences, Division of Clinicial Microbiology**, New Delhi (IN); **Department of Biotechnology, Department of Govt of India**, New Delhi (IN)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 690 days.

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(2), (4) Date: **Jan. 23, 2007**

(87) PCT Pub. No.: **WO2005/063803**

PCT Pub. Date: **Jul. 14, 2005**

(65) **Prior Publication Data**

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(51) **Int. Cl.**
A61K 39/00 (2006.01)

(52) **U.S. Cl.** **424/191.1**; 435/7.1; 435/7.2; 435/7.22; 435/7.9; 435/7.92; 424/185.1; 424/269.1; 530/350

(58) **Field of Classification Search** ..... None
See application file for complete search history.

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Primary Examiner—Jennifer E Graser
(74) *Attorney, Agent, or Firm*—Birch, Stewart, Kolasch & Birch, LLP

(57) **ABSTRACT**

The present invention provides compounds and methods for the detection of anti-leishmanial antibodies in individuals suspected of infection with the protozoan parasite of the genus *Leishmania*, where the infectious agent is an Indian strain and similar or closely related to Indian *Leishmania* strains. The compounds provided include polypeptides as shown in SEQ ID NO: 5 or SEQ ID NO: 6 which are useful for the detection of anti-leishmanial antibodies in individuals where the immune responses are elicited against *Leishmania* species of Indian strains and similar or closely related to Indian *Leishmania* strains, the compounds are also useful as a vaccine and therapeutic agent to prevent and treat leishmaniasis. The present invention further provides a diagnostic kit consisting of antibody raised against polypeptides as shown in SEQ ID NO: 5 or SEQ ID NO: 6 for detecting leishmanial antigens.

23 Claims, 11 Drawing Sheets

- **Polypeptides for the diagnosis and therapy of Leishamaniasis**

Patent number: 7740859
Abstract: The present invention provides compounds and methods for the detection of anti-leishmanial antibodies in individuals suspected of infection with the protozoan parasite of the genus Leishmania, where the infectious agent is an Indian strain and similar or closely related to Indian Leishmania strains. The compounds provided include polypeptides as shown in SEQ ID NO: 5 or SEQ ID NO: 6 which are useful for the detection of anti-leishmanial antibodies in individuals where the immune responses are elicited against Leishmania species of Indian strains and similar or closely related to Indian Leishmania strains, the compounds are also useful as a vaccine and therapeutic agent to prevent and treat leishmaniasis. The present invention further provides a diagnostic kit consisting of antibody raised against polypeptides as shown in SEQ ID NO: 5 or SEQ ID NO: 6 for detecting leishmanial antigens.
Type: Grant
Filed: December 26, 2003
Date of Patent: June 22, 2010
Assignees: All India Institute of Medical Sciences, Division of Clinicial Microbiology, Department of Biotechnology, Department of Govt of India
Inventors: Sarman Singh, Ramu Sivakumar

- **Polypeptides for the Diagnosis and Therapy of Leishamaniasis**

Publication number: 20080031878
Abstract: The present invention provides compounds and methods for the detection of anti-leishmanial antibodies in individuals suspected of infection with the protozoan parasite of the genus Leishmania, where the infectious agent is an Indian strain and similar or closely related to Indian Leishmania strains. The compounds provided include polypeptides as shown in SEQ ID NO: 5 or SEQ ID NO: 6 which are useful for the detection of anti-leishmanial antibodies in individuals where the immune responses are elicited against Leishmania species of Indian strains and similar or closely related to Indian Leishmania strains, the compounds are also useful as a vaccine and therapeutic agent to prevent and treat leishmaniasis. The present invention further provides a diagnostic kit consisting of antibody raised against polypeptides as shown in SEQ ID NO: 5 or SEQ ID NO: 6 for detecting leishmanial antigens.
Type: Application
Filed: December 26, 2003
Publication date: February 7, 2008

Applicants: All India Institute of Medical Sciences Division of Clinical Microbiology, Department of Biotechnology
Inventors: Sarman Singh, Ramu Sivakumar

- **Oligonucleotides for detection of leishmaniasis and methods thereof**

Publication number: 20070134671

Abstract: The present invention relates to a novel oligonucleotide primers having SEQ ID NO: 1, SEQ ID No: 2, SEQ ID NO: 3 and SEQ ID NO: 4 for amplification of the kinesin-related gene of Leishmania species. The invention also provides a method for detecting and differentiating visceral leishmaniasis (VL) and post kala-azar-dermal leishmaniasis (PKDL) causing strains of Leishmania donovani in a sample, comprising isolating DNA from a sample; amplifying the target region from the DNA using novel oligonucleotide primers and heat stable DNA polymerase to obtain amplified fragments; separating the amplified fragments and analyzing the fragments to detect and differentiate VL and PKDL causing strains of Leishmania donovani based on the banding pattern of the amplified fragments. In addition, the invention provides a diagnostic kit for detection and differentiation of VL and PKDL causing strains of the Leishmania donovani.
Type: Application
Filed: December 22, 2004
Publication date: June 14, 2007
Applicants: All India Institute of Medical Sciences, Department of Biotechnology
Inventor: Sarman Singh