



Chaudhary Bansi Lal University, Bhiwani, Haryana

Details of the faculty



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|--------------------|---------------------------|
| Name | Sanjeev Kumar |
| Designation | Professor and Head |
| Department | Biotechnology |

About the faculty

Dr. Kumar obtained his Master degree in Biotechnology (in year 1994) from Guru Nanak Dev University Amritsar. He received a *Gold Medal* in recognition of his achievement during master degree. Later on he completed his Ph.D. degree in Molecular Biology (in year 1999) from Institute of Medical Sciences (IMS), Banaras Hindu University (BHU), Varanasi. His doctoral thesis title was '*Signalling events leading to T-cell activation: proliferation and its modulation by Amphotericin B*'

He received 'Institut National de la Santé et de la Recherche Médicale' (INSERM) fellowship for foreign scientists in year 2000 to further continue his research in the laboratory of Prof. Pierrre Ferrier at *Centre d'Immunologie Marseille-Luminy (CIML), Marseille, France*. During his stay at CIML he worked in the field of T-cell development and studied the regulation of somatic recombination in T-cell receptor (TCR) gene.

Later on he worked as Post doctoral fellow (from year 2000-2003) at *Colorado State University (CSU), Fort Collins, Colorado, USA* and Research Fellow on full time equivalent (FTE) position (from year 2003 to 2008) at *National Institute of Health (NIH), Bethesda, Maryland, USA* in the laboratory of Dr. Carolina Barillas-Mury. During his stay at CSU and NIH he studied the regulation of *Plasmodium* (malaria parasite) development by mosquito innate immunity. He was also a visiting fellow (in year 2002) in the laboratory of Prof. Fotis Kafatos at *European Molecular Biology Laboratory (EMBL), Heidelberg, Germany*.

In year 2008, Dr. Kumar joined Birla Institute of Technology and Science (BITS)-Pilani as an Assistant Professor and served this Institute in various capacities. Presently he is the Professor and Head of Biotechnology Department in Chaudhary Bansi Lal University (CBLU), Bhiwani since year 2016.

Prof. Kumar has 21 years of research and teaching experience in India and abroad and published more than 40 research papers in the peer-reviewed high impact journals of International repute such as, Science, Cell, PNAS USA, JBC, Molecular Cell, Plos One, Frontiers in Immunology etc.

National level exams All India Combined Entrance test (**AICET**) conducted by JNU for admission in M.Sc. Biotechnology (1992).
Qualified Graduate Aptitude Test in Engineering (**GATE**) in Science and Engineering discipline (1994)

Administrative positions held ***At present Institution***
Dean Life Sciences, Registrar, Dean Pharmaceutical Sciences, Head Biotech Department
Convener of various committees

At previous Institution

Associate Dean, Sponsored Research and Consulting Division (SRCD), Convener of Research Proposal Evaluation committee, Convener of Research Travel Grants Screening committee, Professor Incharge, SRCD, President, Staff Association, Coordinator Master in Public Health Program (MPH)

Stats of Highlights

a. Cumulative impact factor: **288** b. H-index: **19** c. i10-index: **29**

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Web links

Google scholar

https://scholar.google.com/citations?hl=en&view_op=list_works&gmla=AJsN-F5wZRoBwccYnbogpwY0C8jT2ExZHkLj_y6BHG4Paq8JdC7inQ0YQnDyiNWCleRg-S1QdOas-WEWZKdZTxV4xyKzlzduP5MoOvR22s_tL0juYG9DVjNizBoix2LW8ogZu3s-awEw&user=l2pjJ7kAAAAJ

Research gate

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Linkedin

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Scopus

<https://www.scopus.com/authid/detail.uri?authorId=56493521100>

Area of research

Dr. Kumar's research is focused to understand the regulation of *Plasmodium* (malaria-causing parasite) development by mosquito innate immune system. His previous research characterized two peroxidase enzymes in the gut of mosquito, which modulate innate immunity against natural symbiotic bacteria. Gene silencing of these peroxidases also suppressed *Plasmodium* development (**Kumar et al., 2010. Science. 327. 1644-48**). Now he is studying the combined effect of mosquito peroxidases and other innate immune molecules on *Plasmodium* development through gene silencing methodology. In addition, he is also developing ways to manipulate novel mosquito immuno-active molecules, which can block *Plasmodium* development and subsequent transmission among humans. The success of these strategies may save the life of millions round the globe.

Research projects and grants received

1. Department of Biotechnology (DBT), Govt. of India, 46 lacs (year 2015-19)
2. Department of Science and Technology (DST), Govt. of India, 47 lacs (year 2012-16)
3. Department of Science and Technology (DST), Govt. of India, 12 lacs (year 2015-18)
4. Indian Council for Medical Research (ICMR), Govt. of India, 30 lacs (for 2015-18)
5. Aditya Birla Group (ABG), 10 lacs (year 2011-13)

Patents

Larvicidal formulation and a process for the preparation thereof. Patent application: 201911003889. *Patent Status:* TEMP/E- 1/4259/2019-DEL.

Inventors: Paul Atish Tulshiram, Sengupta Pracheta, **Sanjeev Kumar**.

Description/Abstract of the innovation: The present invention provides mosquito larvicidal formulation comprising a specific concentration of three plant extracts, and a process of preparation thereof. The formulations of the present invention advantageously provide 100% larvicidal activity against the larvae of different types of mosquitoes.

Peroxidase and Peroxidase Substrate Peptides (PSPs) for Treatment of Inflammatory Disorders and Allergies. *Patent Status:* U.S. Provisional. Application No. 61/308,249 filed 25 Feb 2010 (HHS Reference No. E-073-2010/0-US-01).

Inventors: Carolina Barillas-Mury, **Sanjeev Kumar** and Alvaro Molina-Cruz (NIAID).

Description/Abstract of the innovation: Peroxidases play an important role in protecting the mucosal surfaces, such as in the gastrointestinal and respiratory tracts and inhibit epithelial cell-mediated inflammatory responses (such as those associated with an inflammatory disease or an allergic reaction). This invention can be useful as therapeutics for several autoimmune inflammatory responses (e.g., inflammatory bowel diseases and allergic disorders).

Publications 40 (International Journals), 01 (Indian Journals)

Ten best publications

1. **Kumar S** et al., **2010**. A peroxidase/dual oxidase system modulates midgut epithelial immunity in *Anopheles gambiae*. [Science](#). 327: 1644-1648 (**IF* 41.84**).
2. Kamhawi S, Ramalho-Ortigao M, Pham VM, **Kumar S** et al. **2004**. A role for insect galectins in parasite survival: *Leishmania major* persists in its vector *Phlebotomus papatasi* through binding to PpGalec. [Cell](#). 119: 329-341 (**IF 38.64**).
3. Gupta L, Molina-Cruz A, **Kumar S** et al., **2009**. The STAT pathway mediates late-phase immunity against *Plasmodium* in the mosquito *Anopheles gambiae*. [Cell Host and Microbes](#). 5: 498-507 (**IF 21.02**).
4. **Kumar S** et al., **2003**. The role of reactive oxygen species on *Plasmodium* melanotic encapsulation in *Anopheles gambiae*. [Proceedings of the National Academy of Sciences \(PNAS\) USA](#). 100: 14139-14144 (**IF 11.2**).
5. Spicuglia S, **Kumar S** et al., **2002**. Promoter activation by enhancer-dependent and -independent loading of activator and coactivator complexes. [Molecular Cell](#). 10: 1479-1487 (**IF 17.97**).
6. Yeh JH, Spicuglia S, **Kumar S** et al., **2002**. Control of IL-2R alpha gene expression:

structural changes within the proximal enhancer/core promoter during T-cell development. [Nucleic Acids Research](#). 30: 1944-1951 (IF 16.97).

7. Kumar S et al., 2004. Inducible peroxidases mediate nitration of *Anopheles* midgut cells undergoing apoptosis in response to *Plasmodium* invasion. [Journal of Biological Chemistry](#). 279: 53475-53482 (IF 5.15).
8. Kakani P, Kajla M, Choudhury TP, Gupta L, Kumar S. 2019. *Anopheles stephensi* Dual Oxidase Silencing Activates the Thioester-Containing Protein 1 Pathway to Suppress *Plasmodium* Development. [J Innate Immun](#). 29:1-10. doi:10.1159/000497417 (IF 4.94).
9. Kajla M, Kakani P, Choudhury TP, Kumar V, Gupta K, Dhawan R, Gupta L, Kumar S. 2017. *Anopheles stephensi* Heme Peroxidase HPX15 Suppresses Midgut Immunity to Support *Plasmodium* Development. [Frontiers in Immunology](#). 8:249.doi: 10.3389/fimmu.2017.00249 (IF 7.56).
10. Kajla M, Choudhury TP, Kakani P, Gupta K, Dhawan R, Gupta L, Kumar S. 2016. Silencing of *Anopheles stephensi* Heme Peroxidase HPX15 Activates Diverse Immune Pathways to Regulate the Growth of Midgut Bacteria. [Frontiers in Microbiology](#). 7:135 (doi: 10.3389/fmicb.2016.01351) (IF 5.64).

* IF is the Impact Factor of journal (Thomson Reuter)

Publication
in
conferences

Total 75

Invited talks Total : 30 (Some of the distinguished talks are mentioned below)

'*Agave angustifolia* extract as potent larvicidal against three disease vector *Aedes*, *Culex* and *Anopheles* and its implementation to field trials for controlling vector-borne diseases' at [Ministry of Agriculture, Govt. of India](#), New Delhi Aug 14, 2019.

'*Agave angustifolia* larvicidal activity against *Aedes*, *Culex* and *Anopheles* and its implementation to control mosquito-borne diseases' at [Ministry of Health, Govt. of India](#), New Delhi May 08, 2019.

'Identification of an anopheline-specific heme peroxidase: a novel target to arrest *Plasmodium* development' at "Entomology for Sustainable Agriculture" in 26th National Congress of Parasitology at [Banaras Hindu University](#), Varanasi Jan 21-23, 2016.

'Compartment-specific immune responses in malaria vector determine the vectorial capacity. 25th National Congress of Parasitology on "Global Challenges in the Management of Parasitic Diseases (GCMPD), [Central Drug Research Institute \(CDRI\), Lucknow, UP, India](#). OP 27, 16-18th Oct. 2014.

'Modulation of mosquito immunity during *Plasmodium* development' in Symposium on Molecular basis of vector-pathogen interactions (S 1301) in [XXIV International Congress of Entomology](#),

Daegu, South Korea. Aug 19-25, 2012.

‘Peroxidase-mediated cross-linking of extracellular matrices modulates mosquito gut immunity against microbial antigens’ at International Scientific Meeting on Recent Developments in Malaria Research. **International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi, India.** Dec 1-3, 2010.

‘A secreted *Anopheles* Immuno-modulatory peroxidase 1 (IMP1) regulates *Plasmodium* development’ at **International Congress for Tropical Medicine and Malaria (ICTM2008), Jeju Island, South Korea.** March 26, 2008.

‘A secreted *Anopheles* midgut peroxidase regulates *Plasmodium falciparum* development” at American Society of Tropical Medicine and Hygiene (ASTMH) Symposium*, **Philadelphia, Pennsylvania. USA.** Nov 7, 2007.

‘Immunomodulatory peroxidases in *Anopheles gambiae*: Regulation of epithelial immune responses against gut flora and *Plasmodium*’ at Vector Encounter Meeting, **John Hopkins University, Baltimore, MD, USA.** Jun 22, 2007.

‘A secreted *Anopheles* midgut peroxidase regulates human malaria development’ at Malaria and Vector Biology Group Seminars, **National Institutes of Health, MD, USA.** Oct 10, 2006.

‘Relevance of Time Bomb Model in human malaria transmission’ at **ASTMH Symposium, Miami, Florida, USA.** Nov 7, 2004.

“Immune responses of *Anopheles* midgut epithelial cells to ookinete invasion” at **Keystone Symposium, Taos, New Mexico, USA.** Feb 5, 2004.

“Mechanism of protein nitration and cell death in ookinete-invaded midgut epithelial cells” at **ASTMH Symposium, Denver, Colorado, USA.** Nov 14, 2002

PG thesis supervised

30

PhD thesis supervised

07

Courses Taught

General Biology, Cell Biology, Developmental Biology, Molecular Immunology, Animal Cell and Tissue Culture Technology, Epidemiology, Public Health and Diseases, Research Methodology, Animal Cell Technology, Biology of Infectious diseases

Honors/ Awards/ Fellowships

Best oral presentation award, Punjab Agriculture University (PAU), Ludhiana (2015).

Received travel awards (650,000 Korean ₩) in recognition of outstanding achievements in XXIV International Congress of Entomology, South Korea (2012).

Assortment of Science research article as ‘**Hot Results for Scientific Community**’ in ‘**Science Express**’ (<http://www.sciencemag.org/sciencexpress>) (2010).

National Institute of Health (NIH), Bethesda, USA employee special performance achievement award (for year 2004, 2005, 2006, 2007 and 2008).

Outstanding achievement Post-doc category poster awards, Colorado State University (CSU), Fort Collins, USA (2003).

Post-doctoral fellowship, CSU, USA (2000-2003).

Post-doctoral fellowship for foreign scientists by 'Institut National de la Santé et de la Recherche Médicale (*INSERM*)' France (2000).

Senior research fellowship, University Grants Commission (UGC), Government of India (1997-2000).

Junior research fellowship, UGC (1995-1997).

Gold Medal for outstanding achievements in M. Sc degree, Guru Nanak Dev University (GNDU), Amritsar, India (1994).

Student fellowship during M.Sc. degree, Department of Biotechnology (DBT), Government of India (1992-1994)

Reviewer for scientific journals

Journal of Proteomics & Bioinformatics, Frontiers in Physiology, Insect Molecular Biology Science Journal Publications, Malaria Journal, Plos One, Frontiers in Immunology

Membership of scientific societies

Society of Biological Chemists, India, Indian Society of Cell Biology, Indian Society of Parasitology, National Academy of Vector Borne Diseases, Indian Society for Advancement of Insect Science, The American Society of Tropical Medicine and Hygiene (ASTMH), USA, Keystone Symposia Society, USA. Entomological Society of South Korea