BBSRC AND INDIA

- **BBSRC holds India as a high priority for collaborative activity**
- **We consider workshops to be a key mechanism for pump-priming collaborations and for supporting the plans of researchers**
- **BBSRC continues to encourage interactions with India through our bottom-up India Partnering Awards and through BBSRC's general travel schemes**
- **BBSRC has signed agreements with CSIR and DBT, under which workshops are organised to stimulate UK-India partnerships in strategic areas**

BBSRC support for facilitating international collaboration with India

BBSRC's International Relations Unit (IRU) strives to enhance BBSRC's influence and involvement at the forefront of international science, to exploit international funding opportunities in the interests of BBSRC's scientific community and to capitalise on international links, both at policy and scientific levels. It achieves this through a number of mechanisms.

The India Partnering Awards is a scheme implemented by BBSRC to specifically support UK-India collaborative activity. Our other interactions include visits and scoping studies to India, as well as welcoming Indian researchers and policy makers to the UK.

Full details of BBSRC international activities are on the BBSRC website at: www.bbsrc.ac.uk/international

Visits

BBSRC's International Scientific Interchange Scheme (ISIS) provides a mechanism for initiating and pump-priming collaborations, which allows BBSRC-supported scientists to explore potential international linkages and funding opportunities. Since 2003 BBSRC has spent over £450k to fund 13 visits involving India, which encompassed a range of scientific areas including development of medicinal and aromatic plants, food-crop production and vector borne animal pathogens.

International Workshops

BBSRC sponsored workshops have created good international synergy evidenced by many leading to successful international research projects that have provided considerable added value to UK science. The workshops match numbers of UK scientists with other countries to identify areas of commonality and explore the potential for international collaboration. The workshops aim to input to policy formulation in emerging areas of science, and/or stimulate joint working with other countries active in a particular area.

Additionally, during the course of 2011-12, there was a joint initiative with the Indian federal agency, DBT, in which 3 workshops were arranged, on the topics of Bioenergy, Livestock Health & Disease and Crops. These were put on to stimulate collaboration with Indian lead partners and backed with further funding for joint calls following the workshops.

UK-India Education and Research Initiative (UKIERI)

UKIERI has been an important source of support for sustained interactions between UK and India institutions and researchers. Partnering Awards and visits can lead to proposals for collaborative research projects and other activities. Details are on the UKIERI website at: www.ukieri.org

Human Frontier Science Programme (HFSP)

HFSP is an international programme initiated in 1989, supported by the Australia, Canada, India, Japan, the Republic of Korea, New Zealand, Switzerland, USA and the EU. (www.hfsp.org). It promotes international collaboration through research grants and fellowships in the life sciences. The UK subscription to HFSP (total budget almost US$56M) is currently £1223k, split between the Medical Research Council (£962k) and BBSRC (£261k). Both Councils are represented on the HFSP Board of Trustees. UK and BBSRC supported scientists continue to gain support from HFSP in furthering collaboration, HFSP Fellowships and in joint research projects.

EU Framework Programme

Marie Curie Fellowships under EU Framework Programmes now offer the opportunity for fellows to come in to the EU from any other country (International Incoming Fellowships) or to go out to other countries from the EU (International Outgoing Fellowships). Additionally, the current Seventh Framework Programme (FP7) provides the opportunity for non-EU involvement in the projects and activities funded under its 10 thematic programmes.

Marie Curie also supports the International Research Staff Exchange Scheme, which aims to create closer links between staff working in research organisations in Europe and their counterparts in other international partner countries. The scheme supports staff exchanges of up to 12 months per staff member.

India Partnering Awards (IPA)

Partnerships with India are producing benefits to the UK and the BBSRC community. It is therefore important that BBSRC continues to make efforts to ensure that strong linkages are developed and sustained in the biosciences. The aim of the BBSRC India Partnering Scheme is to provide resources to leading BBSRC-supported research groups to allow them to forge long-term relationships with Indian scientists in areas of research that are of direct relevance to BBSRC's current scientific strategy.

The primary objective of an award is to provide pump-priming, enabling UK research groups undertaking research already funded by BBSRC to embark on creating links with Indian scientists with the overall aim of building long-term partnerships that will ultimately lead to new collaborative research programmes. Awards cover activities such as exchanges of personnel, access to facilities and workshops. Similar BBSRC schemes operate with Japan, the US and China.

Typically, awards are of up to £25,000 over a four-year period with funding being awarded to a leading UK laboratory to partner with one or more Indian equivalents. Although no prescribed mechanisms have been set as to how the grant holder should use the award, support is normally used to fund travel for one or more investigators in either direction. Preference was given to applications that propose the exchange of young researchers, workshops in emerging areas of science and for visits to access facilities not available in the UK.

Following the launch of the scheme in September 2006, 27 partnering awards have been announced with a contribution from BBSRC of £630k. A full list of awards made is shown below.

For further details on any of BBSRC's International Activities please contact:

Jenny Wilson
International Relations Manager
BBSRC

Tel: +44 (0) 1793 414686
Email: jenny.wilson@bbsrc.ac.uk

2012 Call

India- United Kingdom Bioinformatics Network
£25,000
UK lead partner: Dr Jan Kim, Department of Bioinformatics, The Pirbright Institute
Indian lead partner: Dr Rajendra Joshi, Centre for Development of Advanced Computing, Mumbai

Assessing the impact of foot-and-mouth vaccination programs
£24,000
UK lead partner: Dr Richard Reeve, Institute of Biodiversity, Animal Health and Comparative Medicine, University of Glasgow
Indian lead partner: Dr Gunaseelan Lakshmanasami, Madras Veterinary College, Tamil Nadu Veterinary and Animal Science University

2011 Call

India - Transfer of regulatory genes from Arabidopsis to Indian mustard for drought tolerance and yield increase
£23,508
UK lead partner: Prof. Philip Mullineaux, Department of Biological Sciences, University of Essex
Indian lead partner: Prof. Neera Sarin, Jawaharlal Nehru University

India-UK Development of Metabolic Models to Support Systems Biology Approaches to Bioenergy Research
£24,575
UK lead partner: Prof. David Fell, Faculty of Health and Life Sciences, Oxford Brookes University
Indian lead partners: Dr Syed Yazdani, International Centre for Genetic Engineering and Biotechnology (New Delhi) and Prof. K Mukherjee, School of Biotechnology, Jawaharlal Nehru University

Towards process development of bacterial strains able to convert renewables into biofuels and other useful chemical commodities
£27,000
UK lead partner: Prof. Nigel Minton, School of Molecular Medical Sciences, University of Nottingham
Indian lead partner: Dr Kirstin Eley, Research & Development Department, TMO Renewables Ltd.

UK-India Partnership for the control of FMD and PPR
£25,000
UK lead partner: Prof. Satya Parida, Department of Livestock Infectious Diseases, Institute For Animal Health
Indian lead partners: Dr B Pattnaik, Project Directorate, FMD, Indian Council of Agricultural Research and Dr Muthu Chelvan, Department of Virology, Indian Veterinary Research Institute and Dr R.K. Singh, Joint Director of VTCC at Hisa.

India Partnership: Studying diverse growth dynamics in leaves
£18,000
UK lead partner: Prof. Enrico Coen, Department of Cell and Development Biology, John Innes Centre
Indian lead partner: Dr Utpal Nath, Department of Microbiology and Cell Biology, Indian Institute of Science

2010 Call

Strategic Partnership in Skeletal Muscle Biology
£24,970
UK lead partner: Dr Robert Knight, Randall Div of Cell and Molecular Biophysics, King's College London
Indian lead partner: Dr Jyotsna Dhawan, Stem Cell Department, National Centre for Biological Sciences

2009 Call

Developing a UK-Indian strategic alliance to target a UK-Indian problem: *Salmonella* infection
£24,100
UK lead partner: Dr Gary Rowley, School of Biological Sciences, University of East Anglia
Indian lead partner: Dr Dipshikha Chakravortty, Centre for Infectious Diseases Research (CIDR), Dept of Micro Biology and Cell Biology (MCB), Indian Institute of Science (IISc)

Integrating experimental and modelling approaches to understand and predict greenhouse gas emissions
£23,920
UK lead partner: Dr Liz Baggs, Institute of Biological and Environmental Sciences, University of Aberdeen
Indian lead partner: Dr T.K. Adhya, Director, Central Rice Research Institute (CRRI)

India link project for molecular epidemiology studies and orbivirus reference collection
£25,000
UK lead partner: Professor Peter Mertens, Vector Borne Disease Programme, Institute for Animal Health
Indian lead partners: Dr Gaya Prasad, Department of Animal Biotechnology, CCS Haryana Agricultural University, B. Mondal, Indian Veterinary Research Institute (IVRI) and Dr D Sreenivasulu, Department of Microbiology, College of Veterinary Science

Food-Related Health Inequalities in Indian Populations in the UK and India
£23,500
UK lead partner: Professor Clare Mills, Department of Food Structure and Health, Institute of Food Research
Indian lead partner: Professor Darshan Punia, Department of Food and Nutrition, CCS Haryana Agricultural University

2008 Call

A molecular epidemiological approach to combat footrot, an endemic disease of sheep, host and pathogen perspectives from India and GB
£16,400
UK lead partner: Professor Laura Green, Biological Sciences, University of Warwick
Indian lead partners: Professor Shakil Ahmad Wani, Division of Veterinary Microbiology & Immunity, University of Agricultural Sciences & Technology, Jammu and Kashmir

To establish a strategic alliance with India to combat emerging viral diseases of global importance
£24,840
UK lead partner: Professor Kin-Chow Chang, Division of Vetinary medicine, School of Veterinary Medicine and Science, University of Nottingham
Indian lead partners: Professor D. Sreenivasulu, Department of Microbiology, College of Veterinary Science, Andhra Pradesh
Professor N. Dorarirajan, Department of Veterinary Microbiology, Veterinary College and Research Institute, Tamil Nadu
Dr. S.V. Kuchipudi, Assistant professor, Department of Veterinary Microbiology, S.V. Veterinary University, Andghra Pradesh

Predictive modeling of the rice (*Oryza sativa*) metabolic network
£25,000
UK lead partner: Professor David Andrew Fell, School of Life Sciences, Oxford Brooks University
Indian lead partners: Dr. Sudip Kundu, Department of Biophysics, Molecular Biology and Bioinformatics, University of Calcutta, West Bengal
Dr. Swapan K Datta and Sir Rash Behari Ghosh, Department of Botany, University of Calcutta, West Bengal

UK-India partnership on Marek's disease and RNA interference to control avian viral diesases
£24,400
UK lead partner: Professor Venugopal Nair, Department of Microbiology, Institute for Animal Heath, Compton
Indian lead partner: Professor K Kumanan, Department of Animal Biotechnology, Madras Veterinary College

2007 Call

Development of specific microbial consortia for the improvement of renewable bioenergy products
£25,000
UK lead partner: Dr Phil Hobbs, Institute of Grassland and Environmental Research (IGER), North Wyke, Devon
Indian lead partners: Dr Shivaji, Centre for Cellular and Molecular Biology, Hyderabad and Dr Prakasam, Indian Institute of Chemical Technology, Hyderabad

Control of coccidiosis: *Eimeria brunetti*, a neglected but important pathogen of chickens
£25,000
UK lead partner: Professor Fiona Tomley, Institute for Animal Health, Compton
Indian lead partners: Professor Raman and Professor Dhinakar Raj, Madras veterinary College, Tamil Nadu Veterinary and Animal Sciences University, Chennai

A systems biology approach to the annotation of *Mycobacterium* and *Salmonella* genomes
£24,760
UK lead partner: Michael Watson, Institute for Animal Health, Compton
Indian lead partner: Dr Rajendra Joshi, Centre for Development of Advanced Computing, Pune University

2006 Call

Basic and strategic partnerships enhancing UK and Indian plant and crop science
£23,916
UK lead partner: Professor Brendan Davies, Centre for Plant Sciences, University of Leeds
Indian lead partner: Various, in Delhi, Bangalore and Hyderabad

Anglo-Indian Immunoinformatics: Delivering *in silico* Vaccinology
£24,200
UK lead partner: Dr Darren Flower, Nuffield Department of Medicine, University of Oxford
Indian lead partner: Dr G P S Raghava, Institute of Microbial Technology, Chandigarh

Capacity Building in the Life Sciences: a Manchester- Bangalore Strategic Partnership
£23,740
UK lead partner: Professor Stephen High, Faculty of Life Sciences, University of Manchester
Indian lead partner: The Indian Institute of Science, Bangalore

Enhancing Brassica Oilseed Crop Improvement through Genomic Approaches
£23,675
UK lead partner: Dr Graham King, Crop Performance and Improvement, Rothamsted Research
Indian lead partner: Deepak Pental, Vice Chancellor, University of Delhi

Developing novel inhibitors of *Mycobacteria tuberculosis* DNA topoisomerases
£14,600
UK lead partner: Professor Tony Maxwell, Department of Biological Chemistry, John Innes Centre, Norwich
Indian lead partner: Professor V Nagaraja, Microbiology and Cell Biology Department, Indian Institute of Science, Bangalore

CCP4 Workshop on Protein Crystallography - Basic and Advanced Methods
£22,000
UK lead partner: Dr Colin Nave, Synchrotron Radiation Department, CCLRC Daresbury Laboratory
Indian lead partner: Professor B. Gopal, Molecular Biophysics Unit, Indian Institute of Science, Bangalore

Integration of calcium and phosphoinositide signals in animal cells
£17,750
UK lead partner: Dr Raghu Padinjat, Inositide Laboratory, Babraham Institute
Indian lead partner: Dr Gaiti Hasan, National Centre for Biological Sciences, Bangalore

Organisation of the circadian clock in *Drosophila*: correlated responses to selection
£24,000
UK lead partner: Dr Ezio Rosato, Department of Genetics, University of Leicester
Indian lead partner: Professor Vijay Kumar, Evolutionary and Organismal Biology Unit, Jawaharal Nehru Centre for Advanced Scientific Research, Bangalore

International Relations Unit
BBSRC
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