

Combating Avian Influenza – Launched in 2006

Purpose

To enhance understanding of the virology, pathology, host-pathogen interactions and epidemiology of avian influenza in its animal hosts, with a view to generating the underpinning scientific knowledge that will enable the development of more effective methods for its control.

Key aims

Relevant areas of research, appropriate to BBSRC's remit, include:

- Avian immunology, and innate and acquired immunity
- Chicken genomics and genetic variation
- Virology of influenza infection
- Host-pathogen interactions
- Epidemiology in avian populations
- Vaccine development and delivery

Funding total: £4.5M

Number of projects funded: 4

Title	Investigator / Supervisor	Institution	Value £	Status
Viral & host immunomodulators in improved Fowlpox virus recombinant vector vaccines for use in poultry against highly pathogenic Avian Influenza H5N1	Dr Michael Skinner	Imperial College London	376,295	Current
Virus transmission dynamics and the immune response of birds to avian influenza	Professor Ian Brown	Veterinary Laboratories Agency	653,848	Current
Analysis of virulence determinants in full length H5N1 influenza genomes using computational modelling	Professor Andrew Leigh Brown	University of Edinburgh	387,577	Completed
Virus transmission dynamics and the immune response of birds to avian influenza.	Dr John McCauley	MRC National Inst for Medical Research	464,008	Current
Combating highly pathogenic avian influenza: Novel vaccination strategies using recombinant live avian viral vaccine vectors	Professor Venugopal Nair	Institute For Animal Health	654,608	Current
Viral & host immunomodulators in improved Fowlpox virus	Dr Colin Butter	Institute For Animal Health	581,559	Current

Title	Investigator / Supervisor	Institution	Value £	Status
recombinant vector vaccines for use in poultry against highly pathogenic Avian Influenza H5N1				
Virus transmission dynamics and the immune response of birds to avian influenza.	Dr Colin Butter	Institute For Animal Health	1,534,407	Current

Combating Endemic Diseases of Farmed Animals for Sustainability – Launched in 2006

Scope

Research into infectious diseases can be pursued through the study of the pathogen or its host or of the host's environment, or by addressing a combination of two or all three of those aspects of the disease system. Applications are invited for funding of multidisciplinary research that would exploit advances in laboratory, field-based or "in silico" approaches to improve understanding of the biology of endemic diseases of animals farmed for food production in the UK. The proposed research should use up-to-date technologies, such as (amongst others) high-throughput genomic or proteomic analyses, genome-wide association studies or advances in epidemiological analysis and modelling, to investigate - at the cellular, individual animal or population levels - the host-pathogen interface or its relationship with the host animal's environment. The approaches that would be employed may be qualitative, quantitative, theoretical or data-driven (where possible, making use of existing datasets). The initiative is particularly well suited to multidisciplinary approaches that would integrate studies of genetic variation in the host and/or pathogen with the population dynamics of disease. Where appropriate, collaborative proposals that would exploit the complementary skills and resources of different institutions are encouraged.

Proposals are sought for studies of how the complex interactions between, and genotypic and phenotypic variations in, hosts and pathogens affect the outcomes of infections. These might include, for example, effects relating to the age of the host, differences or changes that occur over time or space, or interactions between mixtures of pathogens (or different strains of the same pathogen) in the same host species. Genetic variation in host responses to existing vaccines or diagnostic tests that limits their effectiveness, and the consequences of such variation for disease control, are also within the scope of the initiative. But in line with the initiative's focus on integrative underpinning research, projects concerned primarily with the development of new vaccines or diagnostics - in the absence of related studies of host/pathogen genetics/genomics and/or epidemiology - will not be considered for funding.

For the purpose of this initiative, infectious "diseases" include infestations of animals by "pests", *i.e.* larger internal (helminth) or external (arthropod) parasites, as well as infections by microbial pathogens (viruses, bacteria or protozoa). Diseases currently exotic to the UK and transmissible spongiform encephalopathies (TSEs) are excluded, as are food-borne or other endemic zoonotic diseases - with implications for public health - that are carried by farmed animals but which do not have a significant impact on animal welfare.

In terms of the host, the central focus of the call is on the farmed animal. Proposals for projects involving studies of vertebrate or invertebrate wildlife reservoirs or vectors of infection will also be considered, but such studies must focus on the role of wild animals in the transmission to and/or maintenance of disease in the target food species, not on the nature or incidence of disease in the wildlife host *per se*.

Funding total: £11.2M, Cofunders: Defra and SEERAD

Number of projects funded: 10

Title	Investigator / Supervisor	Institution	Value £	Status
Populations genetics and genomics of ovine nematode parasites and their application	Dr Julian Parkhill	The Wellcome Trust Sanger Institute	144,442	Completed

Title	Investigator / Supervisor	Institution	Value £	Status
to study the molecular basis of anthelmintic resistance.				
Exploitation of virulent/avirulent strain comparison to detect pathogen & host factors critical to the pathogenesis of bovine mastitis due to <i>S.uberis</i>	Professor James Leigh	University of Oxford	1,425,451	Completed
Critical early events at the mucosal/worm interface following infection fo sheep with the abomasal nematode <i>Teladorsagia circumcincta</i>	Professor Alan Archibald	The Roslin Institute	62,491	Completed
The molecular basis and impact on host response of phenotypic variation across <i>Mycobacterium bovis</i> molecular types	Dr Tracey Coffey	Institute For Animal Health	404,183	Completed
The molecular basis and impact on host response of phenotypic variation across <i>Mycobacterium bovis</i> molecular types	Professor Stephen Gordon	Veterinary Laboratories Agency	318,666	Completed
Population genetics and genomics of ovine nematode parasites and their application to study the molecular basis of anthelmintic resistance.	Professor Andrew Tait	University of Glasgow	414,820	Completed
Population genetics and genomics of ovine nematode parasites and their application to study the molecular basis of anthelmintic resistance.	Dr Neil Sargison	University of Edinburgh	15,528	Completed
Critical early events at the mucosal/worm interface following infection fo sheep with the abomasal nematode <i>Teladorsagia circumcincta</i>	Dr Pamela Knight	University of Edinburgh	445,546	Completed
Host-Pathogen interactions of treponemes and hoof tissues in digital dermatitis: How does infection lead to lameness?	Professor Stuart David Carter	University of Liverpool	470,762	Completed
The interplay between host and pathogen genetics in the increasing incidence of bovine tuberculosis	Professor Liz Glass	University of Edinburgh	485,494	Current
The Interplay Between Host and Pathogen Genetic Factors in the Increasing Incidence of Bovine Tuberculosis	Dr Robin Skuce	Queen's University of Belfast	348,159	Current
Aetiology pathogenesis and immunology of post-weaning multi-systemic wasting syndrome in pigs: genetic-environmental interactions	Professor Dirk Werling	Royal Veterinary College	1,906,993	Current
Critical early events at the mucosal/worm interface following infection fo sheep with the abomasal nematode <i>Teladorsagia circumcincta</i>	Professor David Knox	Moredun Research Institute	354,485	Current
Integrated genomic and proteomic characterisation of autotransporter proteins of	Dr David Longbottom	Moredun Research Institute	1,426,854	Current

Title	Investigator / Supervisor	Institution	Value £	Status
obligate intracellular bacteria <i>C. abortus</i> and <i>L. intracellularis</i>				
Autophagy represents a new host-pathogen interface for identification of infectious bronchitis virus proteins that determine virulence	Professor Paul Britton	Institute For Animal Health	361,742	Completed
Exploitation of virulent/avirulent strain comparison to detect pathogen & host factors critical to the pathogenesis of bovine mastitis due to <i>S.uberis</i>	Dr Tracey Coffey	Institute For Animal Health	436,653	Completed
The interplay between host and pathogen genetics in the increasing incidence of bovine tuberculosis	Professor Liz Glass	The Roslin Institute	518,670	Completed
Critical early events at the mucosal/worm interface following infection fo sheep with the abomasal nematode <i>Teladorsagia circumcincta</i>	Professor Alan Archibald	University of Edinburgh	60,186	Completed
Autophagy represents a new host-pathogen interface for identification of infectious bronchitis virus proteins that determine virulence	Professor Tom Wileman	University of East Anglia	265,520	Completed
Population genetics and genomics of ovine nematode parasites and their application to study the molecular basis of anthelmintic resistance	Dr Frank Jackson	Moredun Research Institute	463,764	Completed

Combating Infectious Diseases of Livestock for International Development – Launched in 2008

Purpose

To support high-quality basic and strategic biological and biotechnological research into infectious diseases of the principal livestock species in Sub-Saharan Africa and South Asia, and to forge productive partnerships between scientists in the UK and developing countries.

Key aims

To enhance the livelihoods of the poor of Sub-Saharan Africa and South Asia by generating underpinning scientific knowledge that will improve farm animal health, welfare and productivity by enabling the more effective, sustainable management of livestock diseases.

Co-funding: DFID, Scottish Government

Funding total: £13M jointly from BBSRC and DFID with contributions from the Scottish Government.

Number of projects funded: 16

Title	Investigator / Supervisor	Institution	Value £	Status
Development of a vaccination strategy for the control of malignant catarrhal fever	Dr George Russell	Moredun Research Institute	329,389	Current
Exploiting African swine fever virus surface proteins to develop rapid diagnostic tests and understand virus host interactions	Dr Linda Dixon	Institute For Animal Health	724,816	Current
Development of an improved (DIVA) vaccine against peste des petits ruminants and technology for a control strategy in endemic areas	Dr Michael Baron	Institute For Animal Health	787,014	Current
Development of a vaccination strategy for the control of malignant catarrhal fever	Professor Sarah Cleaveland	University of Glasgow	175,631	Current
Reducing the impact of infectious disease on village poultry production in Ethiopia	Professor Olivier Hanotte	University of Nottingham	170,133	Current
Development of a vaccination strategy for the control of malignant catarrhal fever	Professor David Haig	University of Nottingham	342,501	Current
Reducing the impact of infectious disease on village poultry production in Ethiopia	Professor Peter Kaiser	University of Edinburgh	96,356	Current

Title	Investigator / Supervisor	Institution	Value £	Status
Monitoring and Intervention Strategies for Bluetongue Virus Epidemics in Rural India	Dr Bethan Purse	NERC Centre for Ecology and Hydrology	171,310	Current
Monitoring and Intervention Strategies for Bluetongue Virus Epidemics in Rural India	Dr Simon Carpenter	Institute For Animal Health	487,755	Current
Community based interventions against Tsetse and Trypanosomiasis on the Jos Plateau Nigeria	Professor Sue Welburn	University of Edinburgh	927,259	Current
Developing a 'validation portfolio' to exploit key virulence proteins in Fasciola species for parasite control.	Professor Peter Brophy	Aberystwyth University	285,137	Current
Identification investigation and implementation of plant-based parasite control strategies	Dr Jos Houdijk	Scottish Agricultural College	799,851	Current
Towards the strategic control of endemic foot-and-mouth disease in Africa: new techniques for a neglected problem	Professor Sarah Cleaveland	University of Glasgow	892,423	Current
Anticoccidial vaccine development: the importance of genetic diversity and delivery strategy	Professor Fiona Tomley	Royal Veterinary College	867,142	Current
Determination of the role of hard (Ixodid) ticks in the transmission of lumpy skin disease virus in cattle	Ms Eeva Tuppurainen	Institute For Animal Health	332,236	Current
Reducing the impact of infectious disease on village poultry production in Ethiopia	Dr Robert Christley	University of Liverpool	648,441	Current
Remote Integrated Systems for Controlling Nematodes using Emerging Technology for Both Resource-Poor and Commercial Farmers (RISC-NET)	Professor David Knox	Moredun Research Institute	1,009,889	Current
Antimicrobials and improved diagnostics towards integrated control of CBPP	Professor Declan McKeever	Royal Veterinary College	725,743	Current

Title	Investigator / Supervisor	Institution	Value £	Status
Developing a 'validation portfolio' to exploit key virulence proteins in Fasciola species for parasite control	Professor Aaron Gordon Maule	Queen's University of Belfast	578,551	Current
Monitoring and Intervention Strategies for Bluetongue Virus Epidemics in Rural India	Professor John Pickett	Rothamsted Research	213,363	Current
Understanding the basis of strain restricted immunity to Theileria parva	Professor Ivan Morrison	University of Edinburgh	901,165	Current
Improving the quality of FMD vaccines by understanding the correlation of vaccine-induced protection with humoral and cellular immune responses	Professor Satya Parida	Institute For Animal Health	872,620	Current
Development of novel multivalent vaccines	Dr Ashley Banyard	Veterinary Laboratories Agency	797,291	Current

Insect Pollinator Initiative

Purpose

To promote innovative research aimed at understanding and mitigating the biological and environmental factors that adversely affect insect pollinators.

Key aims

To provide an evidence base to inform the conservation of wild insect pollinators and to improve the husbandry of managed species, in order to avoid the potentially catastrophic loss of the ecosystem services they provide

To provide a basis for reducing current declines and sustaining healthy and diverse populations of pollinating insects for the future

Co-funding: Defra, NERC, Scottish Government, the Wellcome Trust

Funding total: £10M

Number of projects funded: 9

Title	Investigator / Supervisor	Institution	Value £	Status
Impact and mitigation of emergent diseases on major UK insect pollinators	Dr Mark Brown	Royal Holloway, Univ of London	687,305	Current
Modelling systems for managing bee disease: the epidemiology of European Foulbrood	Professor Steven Rushton	Newcastle University	144,959	Current
Investigating the impact of habitat structure on queen and worker bumblebees in the field	Dr William Jordan	Zoological Soc London Inst of Zoology	246,012	Current
Modelling systems for managing bee disease: the epidemiology of European Foulbrood	Dr Edward Feil	University of Bath	160,820	Current
Investigating the impact of habitat structure on queen and worker bumblebees in the field	Dr Claire Carvell	NERC Centre for Ecology and Hydrology	263,614	Current
Investigating the impact of habitat structure on queen and worker bumblebees in the field	Professor Andrew Frederick George Bourke	University of East Anglia	13,138	Current
Impact and mitigation of emergent diseases on major UK insect pollinators	Dr Juliet Osborne	Rothamsted Research	353,373	Current
Impact and mitigation of emergent diseases on major UK insect pollinators	Dr Robert Paxton	Queen's University of Belfast	574,479	Current

Title	Investigator / Supervisor	Institution	Value £	Status
Linking agriculture and land use change to pollinator populations	Dr Nigel Boatman	Food & Environment Research Agency - FERA	217,698	Current
An investigation into the synergistic impact of sublethal exposure to industrial chemicals on the learning capacity and performance of bees	Dr Geraldine Wright	Newcastle University	294,060	Current
An investigation into the synergistic impact of sublethal exposure to industrial chemicals on the learning capacity and performance of bees	Dr Nigel Raine	Royal Holloway, Univ of London	376,250	Current
Urban pollinators: their ecology and conservation	Professor Simon Potts	University of Reading	42,432	Current
Linking agriculture and land use change to pollinator populations	Professor Simon Potts	University of Reading	376,193	Current
An investigation into the synergistic impact of sublethal exposure to industrial chemicals on the learning capacity and performance of bees	Professor Neil Millar	University College London	122,737	Current
Urban pollinators: their ecology and conservation	Dr Jacobus Biesmeijer	University of Leeds	294,529	Current
Sustainable pollination services for UK crops	Dr Jacobus Biesmeijer	University of Leeds	533,300	Current
Urban pollinators: their ecology and conservation	Dr Graham Stone	University of Edinburgh	292,840	Current
An investigation into the synergistic impact of sublethal exposure to industrial chemicals on the learning capacity and performance of bees	Dr Chris Connolly	University of Dundee	664,718	Current
Sustainable pollination services for UK crops	Professor Simon Potts	University of Reading	405,368	Current
Linking agriculture and land use change to pollinator populations	Professor William Kunin	University of Leeds	384,318	Current
Linking agriculture and land use change to pollinator populations	Professor Jane Memmott	University of Bristol	298,553	Current
Can bees meet their nutritional needs in the current UK landscape?	Dr Philip Stevenson	Royal Botanic Gardens Kew	47,417	Current
Urban pollinators: their ecology and conservation	Professor Jane Memmott	University of Bristol	609,372	Current

Title	Investigator / Supervisor	Institution	Value £	Status
Linking agriculture and land use change to pollinator populations	Dr Richard Morton	NERC Centre for Ecology and Hydrology	117,135	Current
Modelling systems for managing bee disease: the epidemiology of European Foul Brood	Professor Matthew James Keeling	University of Warwick	165,362	Current
Unravelling the impact of the mite Varroa destructor on the interaction between the honeybee and its viruses	Professor David Evans	University of Warwick	799,895	Current
Can bees meet their nutritional needs in the current UK landscape?	Dr Geraldine Wright	Newcastle University	795,949	Current

Research and development on *Campylobacter*

Purpose

To reduce the levels of *Campylobacter* in the food chain and ultimately the incidence of *Campylobacter* infection in humans.

Key aims

To help deliver several of the key priorities in the strategy, focussing on:

- Modelling approaches to increase understanding of the organism and the impact of interventions
- Practical, cost-effective control of *Campylobacter*

Funding total: Up to £3M, subject to the quality of the applications received.

Number of projects funded: Not yet awarded.

Co-funding: BBSRC, Defra and FSA

Ecology of Infectious Diseases