Science Strategy 2015-2020

The Pirbright Institute provides the UK with capacity to predict, detect, understand and respond to incursions of specific high-consequence viral pathogens of livestock, and viruses that spread from animals to humans.

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Preventing and controlling viral diseases

Prediction

Monitoring the worldwide spread of viral diseases to identify threats to economic prosperity and health, and providing an early warning to the UK and EU of encroaching viral threats

- Controlling pathogens inside and outside the UK
- Integration of reference laboratories with fundamental and applied research
- Predicting pathogen incursion routes
- Leading and contributing to international disease control networks
- Capacity building in developing countries
- Resolving the epidemiology of virus outbreaks

Detection

Acting as a key UK and global leader in the detection, containment and elimination of high-consequence viral diseases

- Pathogen discovery and monitoring
- Diagnostic test development and validation
- Translating research findings into commercial methods of detection
- Monitoring the presence of viruses in livestock, wildlife and vectors
- Differentiating vaccinated and infected hosts in endemic regions
- Carrying out mass surveillance during and after virus outbreaks

Understanding

Addressing key questions in fundamental science, and identifying the key gaps in our knowledge of the biology of viruses of economic importance

- Characterising virus structure, genetics, replication and evolution
- Exploiting genetic, genomic and proteomic data to understand virus and host function
- Pinpointing factors influencing vector capacity from the laboratory to field
- Understanding routes of transmission of viruses between hosts
- Dissecting virus-vector and virus-host interactions

Responding

Controlling and eliminating viral diseases through development of vaccines, control of insect vectors, predictive modelling and other measures

- Providing vaccinology expertise to both academic and industrial projects
- Developing new control measures and advice for stakeholders
- Advising disease control agencies including OIE, EU, FAO and Defra
- Providing primary diagnostics during virus outbreaks

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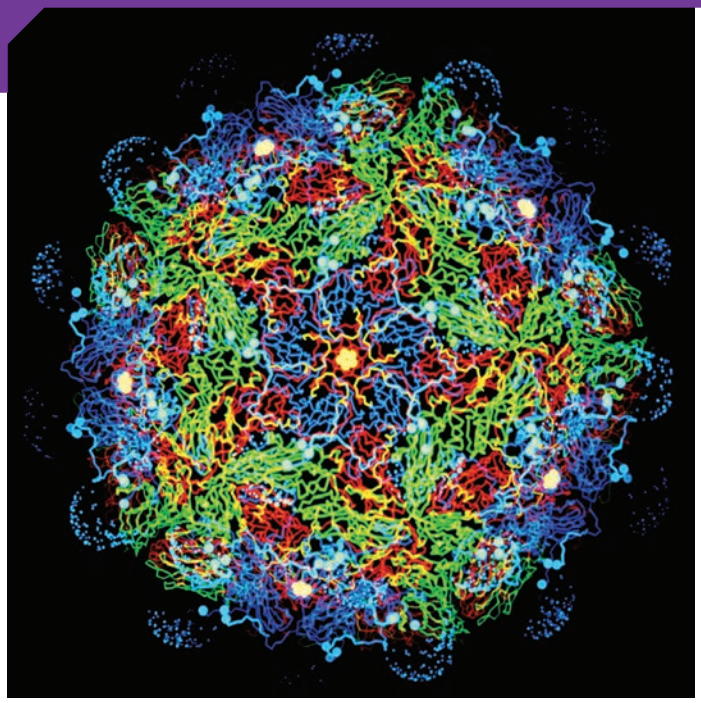

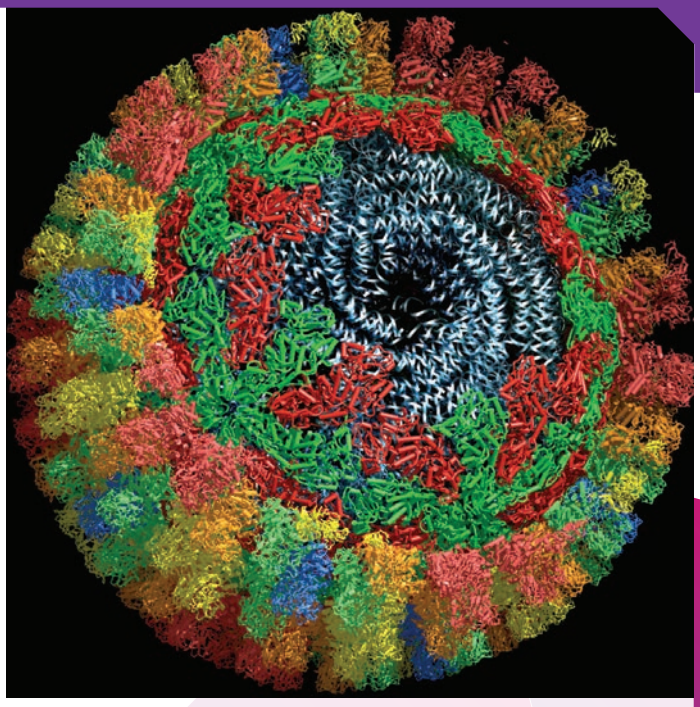

Strategic priorities

- To identify, contain and eradicate economically important viral diseases of livestock which are present in, or threaten, the UK
- To research and survey high consequence livestock and zoonotic virus diseases which are present in, or threaten, the UK
- To act as an international hub for disease surveillance to provide an early warning of possible disease incursions
- To carry out fundamental research into virus genetics, virus-cell interactions, arthropod-virus interactions, disease pathogenesis, and livestock and avian immunology and vaccinology
- To control livestock and zoonotic virus diseases by the development of vaccines, antivirals, diagnostics, genetic selection, genetically modified animals and athropod vectors, and the modelling of disease outbreaks
- To provide national facilities and expertise in high bio-containment laboratories, insectaries, animal facilities and collections of vectors and viruses which are accessible to the UK academic and commercial communities

Capabilities

- Expertise in studying and responding to virus diseases
- Bio-containment facilities (for laboratory and *in vivo* studies)
- International Reference Testing Laboratories: UKAS accredited testing laboratory No.4025
- Inbred lines of animals, collections of arthropod vectors and viruses
- Detailed understanding of pathogenesis and the host responses to infection
- Insectary facilities for mass production and contained infection with pathogens
- High bio-containment engineering and biosecurity expertise
- Next generation sequencing and *in vitro* bio-imaging in high containment
- Bioinformatics

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Major stakeholders

- Biotechnology and Biological Sciences Research Council (BBSRC)
- UK Department for the Environment, Food and Rural Affairs (Defra)
- Wellcome Trust, Medical Research Council (MRC) and other UK research funding agencies
- International funding and disease control agencies, such as OIE, WHO, FAO, the European Commission, Bill and Melinda Gates Foundation
- Industrial producers of veterinary vaccines and antivirals
- Farmers and livestock keepers

Our mission

To be the world's leading innovative centre for preventing and controlling viral diseases of livestock.

THE Pirbright INSTITUTE

BBSRC bioscience for the future

Athena SWAN Member

The Pirbright Institute receives strategic funding from BBSRC

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