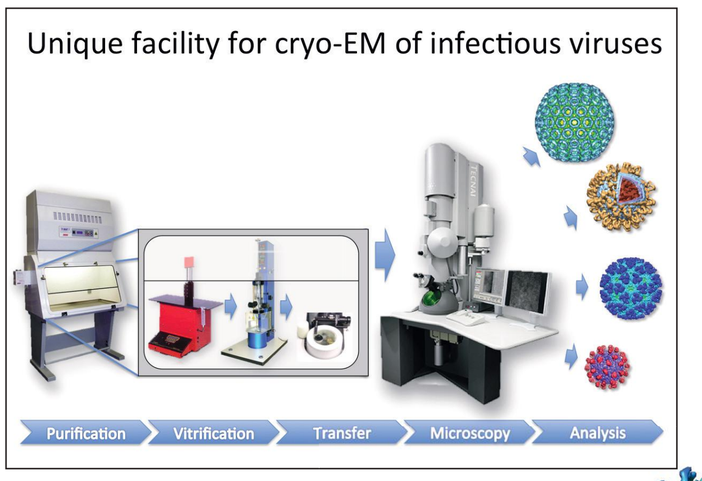
The Wellcome Trust Centre for
Human Genetics

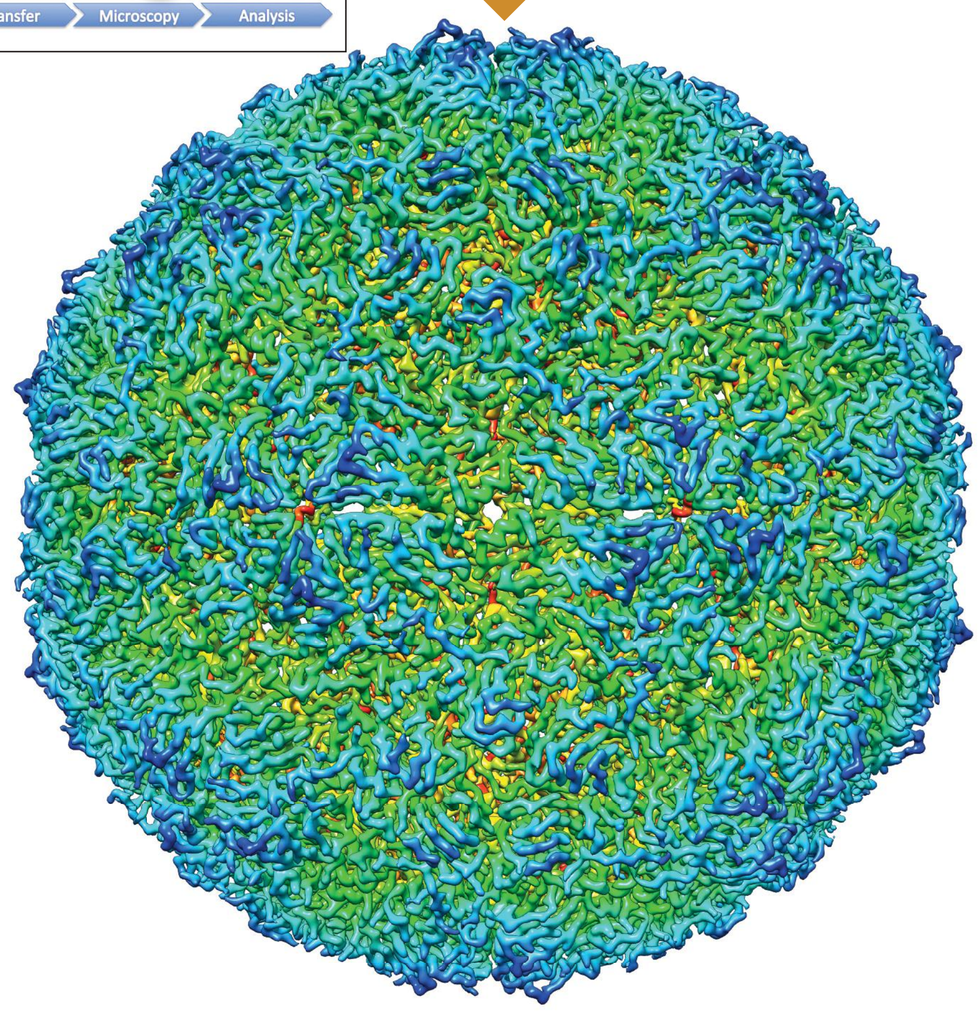
UNIVERSITY OF OXFORD

Oxford Particle Imaging Centre – containment facility for high-resolution bio-imaging of viruses



Staff at work in OPIC

Atomic resolution structure of foot and mouth disease virus



WHAT WAS KNOWN

- Structures of recombinantly-produced viral proteins provide clues on how viruses function and structure-based drug design helps to combat infections
- Electron cryo-microscopy provided the context, the picture of the whole virus, into which these structures can be fitted. Protein–protein interfaces and viral surface epitopes could then be mapped
- Cryo-EM had been largely limited to the study of viruses not requiring specialised containment facilities, and thus information was lacking for several human and animal viruses
- Biological containment facilities were being set up for cryo-EM in the USA and Australia

WHAT WE DID

- In 2001 an infrastructure bid to the Wellcome Trust secured funding for the establishment of the Oxford Particle Imaging Centre as the first containment facility dedicated to cryo-EM in Europe
- Developed procedures and infrastructure for handling of infectious viruses, ensuring safety of the personnel and environment
- Used the methods for designing better vaccines against foot-and-mouth disease virus

WHAT THIS ADDS

- Viruses of biomedical and veterinary importance can be studied at unprecedented resolution. This contributes to our understanding of infection mechanisms and facilitates vaccine design
- As part of the national Electron Bio-Imaging Centre (Diamond Light Source, UK), we started providing access to the wider European structural biology community in 2014

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