

York mathematician probes geometric route to combat viruses

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A mathematician at the University of York has been awarded a Research Leadership Award of more than £700,000 by the Leverhulme Trust to study the geometry of viruses.

Dr Reidun Twarock, an Anniversary Reader in the Departments of Biology and Mathematics, will study the structure and assembly of viruses, which will help to develop new anti-viral strategies.

Viruses have highly symmetrical external shells formed from proteins that encapsulate the viral genome. Dr Twarock has developed a method for encoding the structures of these protein shells that pinpoint the locations of the proteins and the bonds between them. With collaborators Professor Cristian Micheletti, from the International School for Advanced Studies (SISSA) in Trieste, Italy, and Professor Anne Taormina, from the University of Durham, she has used these results to model the assembly of viruses.

Subsequent work with collaborators Professor Peter Stockley, Dr Neil Ranson and their groups at the Astbury Centre for Structural Molecular Biology at the University of Leeds suggests that not only the geometry of the viral capsids themselves but also the full three-dimensional structures of the particles are constrained. The implications of this discovery on virus assembly are currently being investigated.

Dr Twarock said: “I would like to use the Leverhulme Trust Award to build up a group of mathematicians, computational biologists and

biophysicists to address a portfolio of projects arising from these results.”

This grant will enable Dr Twarock to expand her group and fund three postdoctoral positions and four PhD students. The group will collaborate closely with the Astbury Centre in Leeds, and they will jointly organise a workshop on Mathematical Virology at the International Centre for Mathematical Sciences in August 2007.

Dr Twarock’s group will be part of the York Centre of Complex Systems Analysis (YCCSA), including biologists, mathematicians and computer scientists, which is based in the Department of Biology at York.

Source: University of York

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