NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

SEMINAR

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Roles for Glycosylation in the Lives of Enveloped Viruses

By **Pauline M Rudd**

Adjunct Professor of Glycobiology
at University College, Dublin



About the speaker:

*Professor Pauline M. Rudd BSc, LRIC, MA (Oxon), PhD is the Adjunct Professor of Glycobiology at University College, Dublin and currently Visiting Investigator at the Bioprocessing Technology Institute, A*Star. She heads the GlycoSciences Research Group at the National Institute for BioProcessing Research and Training in Ireland (NIBRT). She has many links with academic groups, regulators and pharmaceutical companies across the world because GlycoScience is a major area of specialised expertise required to probe the pathways in many diseases and to ensure the safety and efficacy of biotherapeutic drugs, such as monoclonal antibodies for cancer and autoimmune disorders.*

Professor Rudd obtained a BSc in Chemistry at the University of London and a PhD in Glycobiology at the Open University, UK. She was a Founding Scientist of Wessex Biochemicals (later Sigma London), Visiting Research Associate at The Scripps Research Institute, CA, Visiting Professor of Biochemistry at Shanghai Medical University PRC, Visiting Scientist at Ben Gurion University of the Negev, Israel and Erskine Visiting Fellow, Canterbury University, Christchurch, New Zealand. She is a Fellow of the Royal Society of Medicine, London and a Visiting Professor at St. George's Hospital, London and an Adjunct Professor at North Eastern University, Boston, NUI Galway and Trinity College Dublin. She is a Visiting Investigator at the Bioprocessing Technology Institute (BTI), in A-Star, Singapore. She has more than 250 scientific publications and has given over 300 lectures and seminars at international meetings. Her research has focussed on developing novel technologies and bioinformatics programmes to probe disease related glycosylation changes and systems biology, particularly in cancer and immunology. She has held seven FP7 grants with colleagues from many EU countries. In 2010 she was awarded the James Gregory Medal and an Agilent Thought Leader award and in 2012 she received a Waters Global Innovation award. In 2014 she was awarded an Honorary Doctorate at Sahlgrenska Academy in Gothenburg University, Sweden. Before moving her group to Dublin in 2006, Professor Rudd was a member of the Glycobiology Institute for 25 years. When she left she was a Senior Research Fellow and a University Reader in Glycobiology at Oxford University

Most enveloped viruses such as HIV, Ebola, Influenza, HCV and HBV, are coated with lipids containing heavily glycosylated glycoproteins. The glycans on the envelope glycoproteins play many critical roles in the life cycles of such viruses including (a) the biosynthesis of the viral coat glycoproteins which use the host's glycan processing machinery (b) folding of the monomers (c) assembly of the multimers in the ER (d) budding from the cell surface, transport through the body (e) camouflaging the virus from the immune system (f) attachment, fusion and entry to host cells. In some cases, such as HIV, the glycans provide epitopes for neutralising antibodies (1), an understanding of which may lead to possible routes for therapy. Interfering with protein folding using glycosylation processing inhibitors has also been successful in delivering anti-viral therapy in combination with other drugs.

1. Calarese DA, Scanlan CN, Zwick MB, Deechongkit S, Mimura Y, Kunert R, Zhu P, Wormald MR, Stanfield RL, Roux KH, Kelly JW, Rudd PM, Dwek RA, Katinger H, Burton DR, Wilson IA. Antibody domain exchange is an immunological solution to carbohydrate cluster recognition. Science. 2003 Jun 27;300(5628):2065-71. PubMed PMID: 12829775

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