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Interactions between viral structural proteins and human host factors

Elucidation of networks of interactions between viruses and host cells will pave the way towards the understanding of molecular determinants of cytopathogenicity and ultimately the design of novel therapeutics. Our strategy is to identify human restricting and enhancing factors of viral infections. We focus on viral structural proteins, which not only play key roles at early and late stages of the replication cycle but also act as regulators of cellular processes through specific interactions with cellular pathways. We have conducted a series of yeast two-hybrid screens using the cytosolic domains of the structural proteins of human coronavirus and influenza A virus as baits. Our studies have revealed novel interactions that have opened new routes of investigation. We have identified a PDZ-binding motif in the C-terminal domain of the SARS-CoV small envelope protein, responsible for interaction and mislocation of the PDZ domain-containing tight junction protein PALS1, loss of epithelial cell polarity and potentially enhancement of viral dissemination. We found that the interaction between SARS-CoV Spike C-terminal tail and the cytoskeleton-binding protein ezrin is involved in restriction of viral entry and limits Spike-dependent fusion. We have identified that the C-terminal domain of influenza A virus M2 interacts with human annexin A6. We found that annexin A6 expression alters influenza A virus morphogenesis and restricts release of progeny virions. I will present an overview of this work and of our most recent findings.

Biography

Beatrice Nal graduated with a PhD in Immunology in 2002 (CIML, France). After a Post-doc at Institute Pasteur in Paris, she joined the Hong Kong University-Pasteur Research Centre and was appointed Research Assistant Professor and head of the Virus-Host Interactions group in 2006. She transferred her lab to Brunel University London in 2011. Her major research interest is the understanding of molecular determinants of viral pathogenesis. She has made new important discoveries on mechanisms of virus assembly and viral cellular interactomes for dengue virus, coronaviruses and influenza A virus.

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