Soutenance

THESE

Mardi 18 Mai 2021 à 16h

Visioconférence

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Multi-scale studies of Measles virus nucleocapsid assembly

Thèse de Doctorat de l'Université de Grenoble

Liquid-liquid phase separation is a crucial phenomenon throughout biology involved in multiple cellular processes and responsible for forming membraneless organelles that are essential for the intracellular spatial and temporal organisation. Such organelles have been proposed to be involved in the formation of so-called viral replication factories, which result from infection by a number of negative single-strand RNA viruses.

Here, we study measles replication machinery phase separation *in vitro*, we identify the nature and location of the required interactions and show that certain essential processes are accelerated, in particular nucleocapsid assembly where the measles nucleoprotein binds to the genomic RNA to form helical capsids. Proteins involved in measles replication are known to be phosphorylated in the cell, however, the functional role of this post-translational modification was not previously understood. During my thesis we discovered that phosphorylation of measles phosphoprotein triggers nucleocapsid assembly.

To better understand the physical origin of protein phase separation, we studied protein structure and dynamics using a model system. Using a disordered part of measles nucleoprotein, we compare protein behaviour between dilute and condensed states. Using NMR spectroscopy, we perform a site-specific comparison of motional amplitudes and timescales of the protein between phases.

Finally, SARS-COV-2 has also been shown to form viral condensates requiring only one viral protein: the nucleoprotein. We characterise the intrinsically disordered regions of SARS-COV-2 N and demonstrate its phase separation *in vitro*.

Lien pour suivre par visioconférence : *https://univ-grenoble-alpes-fr.zoom.us/j/92446427908?pwd=eUpCN2NydHlKVndvZXhsZzQ3M3MvUT09*

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