INSTITUTE FOR INTEGRATIVE BIOLOGY OF THE CELL

Post-doctoral position on the mechanisms of bacteriophage selective DNA packaging and transduction of bacterial DNA

A post-doctoral position is available to study the mechanisms used by bacterial viruses (bacteriophages) for selective encapsidation of their DNA in the viral procapsid. The molecular basis of errors in this process leading to encapsidation of bacterial DNA (transduction) will be also investigated. These errors constitute a major source of horizontal gene transfer that is responsible for the rapid dissemination of antibiotic resistance, pathogenicity factors and other genetic elements within bacterial communities.

Research will be carried out with bacteriophage SPP1 that infects the Gram-positive bacterium *Bacillus subtilis*. The project builds on current knowledge on the SPP1 genome packaging process (*Nucleic Acids Res* **41**, 340-354; *J Mol Biol* **429**, 1381-1395; *Nat Commun* **10**, 4840; *PNAS* **118**, e2018297118; *Nat Commun* **13**, 7283) and on the discovery that this phage can rapidly evolve to become a highly efficient vector for bacterial DNA transfer. Our goal is to decipher the interactions of the SPP1 multiprotein complex TerS-TerL with viral DNA that ensure its selective packaging and the degeneration of these interactions leading to transduction. The approach is interdisciplinary, combining molecular biology, omics, biochemistry and virus engineering.

Research will be carried out in the team Bacteriophages of Gram-Positive Bacteria (https://www.i2bc.paris-saclay.fr/bacteriophages-of-gram-positive-bacteria/) of Institute of Integrated Biology of the Cell (I2BC). I2BC hosts ~60 research teams working on molecular and cellular biology processes (https://www.i2bc.paris-saclay.fr/) in the CNRS Campus of Gif-sur-Yvette (Paris region). The Institute offers state of the art facilities for molecular biology, genomics, microbiology, advanced cell imaging, proteomics, and structural biology research.

The project is particularly suitable but not limited to candidates holding a PhD on bacterial/phage genetics, molecular biology or biochemistry. The position is initially for 1 year, renewable. To apply please submit your CV and a short research statement including the name and e-address of references at the CNRS portal: https://emploi.cnrs.fr/Offres/CDD/UMR9198-PAUDER-005/Default.aspx?lang=EN. If you have any questions please contact Paulo Tavares (paulo.tavares@i2bc.paris-saclay.fr). Starting date is 1 April 2025 or after. Salary is according to CNRS CDD grids.

INSTITUT DE BIOLOGIE INTEGRATIVE DE LA CELLULE (I2BC)
UMR 9198 / CEA / CNRS / Université Paris Sud / USC1358 INRA
1, Avenue de la Terrasse – Bâtiment 14B – F91198 GIF-SUR-YVETTE Cedex
www.i2bc-saclay.fr