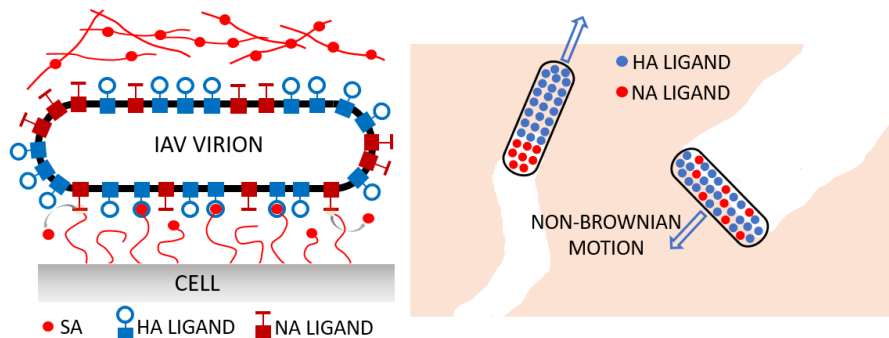


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Job Title: Infection Dynamics of Influenza Viruses

A fully funded 4-year Ph.D. position in **biophysics** is available starting in 2024 at the Physics of Complex Systems and Statistical Mechanics Laboratory, *Université Libre de Bruxelles*, Brussels (<http://complex.ulb.ac.be>) working in collaboration with Dr. B. Moggetti.



Job Summary: We are seeking a highly motivated Ph.D. candidate to join our research team in the investigation of Influenza A Virus (IAV) infection dynamics. IAV virions interact with their environment through two membrane proteins: hemagglutinin (HA) and neuraminidase (NA). HA ligands form supramolecular bridges by binding sialic acid (SA) molecules tipping cell receptors and macromolecules in the intercellular milieu. Conversely, NA ligands limit the number of these bridges by cleaving SA molecules.

This project aims to investigate how the affinity between the two types of ligands and the host receptors, along with the virion's shape, affect the infection dynamics of IAV. Specifically, we will focus on the motility of IAV virions in the extracellular milieu and at the cell's surface using theory and reaction-diffusion simulations [1]. The emerging motility of the virions will be used to parametrize cellular automaton models for virus spread dynamics.

Inspired by IAV virion mobility, we will also explore the design of synthetic molecular walkers featuring peculiar types of motions.

References: [1] [L. Stevens, S. de Buyl, B. M. Mognetti Soft Matter 19, 4491 \(2023\)](#)

Requirements: The ideal candidate will be knowledgeable in numerical modeling, biophysics, soft matter, and statistical mechanics with some experience in numerical modeling. She/he will be fluent in spoken and written English.

Applications should be sent to Bortolo.Matteo.Mognetti@ulb.be and should include the following documents:

- CV of the candidate.
- Cover letter highlighting the research skills and the motivation of the candidate.
- The contact details of two references.

Further inquiries about the project and the position are welcome.

Deadline: 30/06/2023 or as soon as a successful candidate has been selected.