Post-doctoral position open at UMR Virology ENVA-ANSES-INRAE, Maisons-Alfort, France

Survival of Crimean-Congo Hemorrhagic Fever virus in the environment: modeling tick infection with Hazara virus and characterizing tick antiviral immunity mechanisms

24 months starting November 2022

Project: Climate change and ecosystem collapse promote geographic expansion of vector-borne diseases, as witnessed by the recent incursions into Western Europe of the virus responsible for Crimean-Congo hemorrhagic fever (CCHFV). Among tick-borne viruses, CCHFV has the widest distribution throughout the world. In humans, it causes fever and hemorrhage, accompanied by a generally high mortality rate (10 to 40%). Of note, Crimean-Congo hemorrhagic fever has appeared since 2015 on the WHO's list of emerging infectious diseases most likely to cause major epidemics. CCHFV is maintained in a tick-vertebrate-tick cycle, principally involving ticks of the *Hyalomma* genus, *H. marginatum* being present in the south of France since 2015. After acquisition of CCHFV, the tick maintains the virus for its entire life span (between 2 and 6 years) and assures its transmission not only from one developmental stage to the following but also from the female to its offspring. Thus, in addition to its role as a vector, the tick serves as a reservoir for CCHFV. Despite the central role of the tick in the biology of CCHFV, very few studies have addressed the molecular mechanisms that confer the capacity of ticks to endure CCHFV infection and ensure viral transmission. This project aims to provide underpinning knowledge as to the molecular mechanisms that permit persistence of CCHFV within ticks of the *Hyalomma* genus, with the ultimate goal of developing innovative strategies to deploy in the fight against vector-borne viruses. Tick infection will be modelled using the Hazara virus, a level 2 model of CCHFV. This project will define the tick tissues in which the virus persists during the different stages of the tick cycle (moulting, reproduction), and characterize the mechanisms of antiviral immunity that confer upon the tick its capacity to control viral infection and thus maintain the virus in the environment.

Environment: The joint research unit (UMR) Virology, governed by ANSES, ENVA and INRAE, is located in Maisons-Alfort, easily accessible from Paris by bike, subway or bus. Our activities are focused on animal viruses responsible for epizootics or presenting a risk of zoonotic transmission and/or emergence, which present a threat to food safety, animal health or human health. You will join the ThAI (Therapeutics and Antiviral Immunity) team, whose research work concerns virus-host interactions at different scales with the aim of developing better means of control (vaccines, therapies, risk assessment). You will also work in collaboration with the Institut Pasteur's Virus and RNA interference unit, internationally recognized for its work on antiviral defense mechanisms in insects, and with the UMRs BIPAR and ASTRE, whose expertise on the risks associated with ticks of the genera *Ixodes* and *Hyalomma* has been long established.

Candidates: Applicants are expected to have a strong background in investigation of arboviruses and strong skills in molecular biology and virology techniques. In-depth knowledge in medical entomology and in antiviral mechanisms in arthropods would be appreciated. Excellent teamwork, writing and communication skills in English are required.

Application: please send your application (CV including list of publications and names of 2 referees + Cover letter describing past research experiments, your research interests and career goals, and motivation to join our laboratory) to

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