Zenith

INTERNATIONAL PHD PROGRAM IN NEUROSCIENCE

ZENITH SEMINARS

FRIDAY, 27 NOVEMBER 2020
AT 5:00 PM (CET)

ALEKSANDRA WALCZAK

LABORATOIRE DE PHYSIQUE THEORIQUE
ECOLE NORMALE SUPERIEURE
PARIS, FRANCE

PREDICTION IN IMMUNE REPERTOIRES

Living systems often attempt to calculate and predict the future state of the environment. Given the stochastic nature of many biological systems how is that possible? I will show that even a system as complicated as the immune system has reproducible outcomes. Yet predicting the future state of a complex environment requires weighing the trust in new observations against prior experiences. In this light, I will present a view of the adaptive immune system as a dynamic Bayesian machinery that updates its memory repertoire by balancing evidence from new pathogen encounters against past experience of infection to predict and prepare for future threats.

Walczak received her PhD in physics at the University of California, San Diego. After a graduate fellowship at KITP, she was a Princeton Center for Theoretical Science Fellow, focusing on applying information theory to signal processing in small gene regulatory networks. Currently she is a CNRS research director at the Ecole Normale Superieure in Paris, interested in the effects of selection on population genealogies, collective behavior of bird flocks, fly development and statistical descriptions of the immune system. She was awarded the “Grand Prix Jacques Herbrand de l’Académie des sciences" in 2014 and the bronze medal of CNRS in 2015.

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