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Fitness landscapes and the predictability of evolution

Fitness landscapes describe the relationship between genes and their carriers' long-term reproductive success. The shape of the fitness landscape determines whether evolution is predictable or repeatable, i.e. whether we can forecast the endpoint or the path of evolution. Therefore, fitness landscape research promises applications in drug development, prevention of drug resistance, or regarding risk management related to global warming. In my talk, I will introduce examples of fitness landscape models and discuss their strengths and limitations. I will show how experimental fitness landscapes can be obtained to evaluate theory and which new questions arise in light of the (mis?)match of experimental and theoretical fitness landscapes. My goal is to convey to the audience the scientific process of addressing challenges in evolutionary theory, which often raises new questions rather than providing all the answers.



Claudia Bank

Claudia Bank is a professor in Theoretical Ecology and Evolution at the University of Bern in Switzerland. After her undergraduate training in Mathematics at the University of Bielefeld in Germany, she obtained a PhD in Population Genetics from the University of Veterinary Medicine in Vienna in 2012. Prof. Bank's postdoctoral research at the EPFL in Lausanne, Switzerland, included a fellowship from the Simons Foundation to spend a semester at the University of California at Berkeley in the US. From 2016 to 2020, Prof. Bank led a research group in Evolutionary Dynamics at the Gulbenkian Science Institute in Oeiras, Portugal, before relocating the group to Bern in late 2020.

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