

Cologne Evolution Colloquium

Daniel Weinreich

Brown University & CEFE, Montpellier

When does the direction of natural selection depend on population size?

Classical evolutionary theory holds that the efficiency, but not the direction, of natural selection depends on population size. In small populations, drift overwhelms selection, rendering all fitness-affecting mutations selectively neutral. Yet, beneficial mutations never become deleterious and deleterious mutations never become beneficial. Remarkably, several mutations, including modifiers of recombination and mutation rate, have now been shown to be favored at some population sizes but disfavored at others. Previously, we have designated this phenomenon sign inversion. Here we show that all mutations susceptible to sign inversion can confer both fitness costs and benefits on their carriers that vary either between mutant lineages or across time within the same lineage. Using computer simulations, we demonstrate that both between-lineage and within-lineage variability can cause sign inversion and elucidate the common mechanism.

Wednesday, April 28, 2021, 17:00

Institute for Biological Physics

Online via Zoom

Hosted by Joachim Krug