

Invitation to the Seminar series in Evolutionary Biology

Tuesday, 03.09.2024

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Title: The paradox of the organism: internal conflicts, selfish elements, and the evolution of individuality

Abstract:

Biological entities represent nested hierarchies: genes bond together into genomes, genomes co-inhabit cells, cells cluster together to form multicellular individuals, and individuals may form eusocial groups. These different levels of organization were produced through evolutionary transitions in individuality, in which once-independent particles have bundled together into collectives that become individualized in their own right. Successive repeats of this process is what yields increasingly-complex biological entities. The study of evolutionary transitions in individuality has focused largely on the benefits of coming together, whereas the role of internal conflicts in the formation and maintenance of collective agents has remained underappreciated. This sentiment is reflected in the 'paradox of the organism', which refers to the observation that organisms appear to function as coherent purposeful entities, despite the potential for within-organismal components like selfish genetic elements and cancer cells to erode them from within. Such selfish elements reveal underlying conflicts that act within the organism, where selection acts differently on its constituent components to evolve adaptations that interfere with organismal function. Can we quantify to what extent do such internal conflicts undo the organism as an evolutionary individual in their own right? Can selfish elements actually tear an organism apart? Can evolutionary transitions in individuality be undone? Such questions form a red thread through my research, and I will discuss some of my past, ongoing, and future work on internal conflicts and their influence on organismal adaptation and the evolution of individuality.

Host: Prof. Hanna Kokko

The colloquium takes place on Tuesdays at 12:15 pm until approx. 1:15 pm in the BZ 1 lecture hall (HS 00.187). Talks are given in English. Everyone interested is welcome!