Graduate School Event

Thesis Defense: The effect of circadian rhythm on organisational immunity of ant colonies

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Host: Georgios Katsaros

Social interaction networks of insect colonies facilitate efficient information exchange and demonstrate adaptive changes to mitigate disease transmission. While circadian rhythms influence individual behaviour, their role in shaping colony-level defences against pathogens remains unexplored. Here, we investigate whether social networks of the black garden ant, Lasius niger, exhibit circadian rhythms and how these rhythms influence disease vulnerability when colonies are exposed to a pathogen during the day or the night.We first establish baseline daily variations in activity and network dynamics in pathogen-free colonies, revealing constitutive daily fluctuations in disease susceptibility. Subsequently, we examine pathogen-induced changes in sanitary care and network dynamics by exposing foragers to a natural pathogen (Metarhizium brunneum) during either the day or night. Individual pathogen loads were measured after a nine-hour post-exposure period to evaluate transmission outcomes.Our results demonstrate that diurnal ant colonies maintain robust circadian patterns in network properties while flexibly adapting to pathogen exposure. Ants upregulate sanitary care irrespective of exposure timing, prioritising the protection of the valuable colony centre consisting of nurses and the queen. These findings underscore the robustness and adaptability of ant colonies in balancing circadian rhythms with effective social immune responses.

Thursday, January 23, 2025 01:00pm - 02:00pm
Moonstone Bldg / Ground floor / Seminar Room E and zoom

This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.
Please find a schedule of the ISTA Shuttle on our webpage:
https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.