

The Father Factor: Non-genetic paternal influences on offspring reproduction and health

Supervisory team:

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Project description:

The Father Factor: Non-genetic paternal influences on offspring reproduction and health. Evidence is accumulating that a father's condition can be transferred non-genetically to the next generation and affect offspring development, performance and health. To date, the mechanisms underlying such paternal condition-transfer effects remain poorly understood and their evolutionary consequences are largely unexplored. In this project you will use a Japanese quail (*Coturnix japonica*) model system, in which paternal condition-transfer effects on offspring reproductive performance have previously been demonstrated, to identify the origin, function and evolutionary consequences of non-genetic paternal effects using a highly multidisciplinary and integrative approach.

Using in vivo experiments combined with state-of-the-art-omics techniques you will test how favourable or harsh early life conditions experienced by males affect their sperm and seminal fluid composition, and how different components of the male's ejaculate mediate inter-generational effects on the daughters' reproductive performance and health. Experimental in vivo and molecular work will be complemented by evolutionary modelling to quantify the role of paternal condition-transfer effects in altering the response to selection, as well as the potential of experimental interventions to modify evolutionary trajectories of reproductive traits under selection through paternal effects.

The project will provide fundamental novel insights into the mechanisms underlying paternal condition-transfer effects across generations and the potential of early life interventions to alter evolutionary trajectories, both directly relevant to the management of animal health and performance as well as our understanding of the reproductive lives of birds.

During the project you will obtain interdisciplinary training in a variety of state-of-the-art approaches and techniques that are highly sought-after by employers in and outside of academia, including experimental in vivo skills, molecular techniques, bioinformatics, and mathematical modelling. You will be based in a thriving, friendly and inclusive department and benefit from the complementary expertise of a highly multidisciplinary supervisory team.

Relevant papers: Pick et al (2019) doi: 10.1002/evl3.125, Immler (2018) doi: 10.1038/s41437-018-0111-0, Borziak et al (2016) doi: 10.1038/srep35864.