

## **Social modulation of the immune response and epigenetic transgenerational effects - additional support for Europe**

Initiative: Evolutionsbiologie (beendet)

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Challenges to the immune system are often determined by the frequency and the form of social interactions. As a consequence, the risk for horizontal transmission of parasites and disease is higher in social groups. In birds, females allocate immune-priming substances to the egg, which have been shown to be modulated by the social environment they experience. Additionally, immune challenges of females during egg production alter the deposition of steroid hormones to the yolk. Both yolk hormones and antibodies have been shown to affect offspring immunity and physiology. However, it is largely unknown how these physiological changes affect behaviour and fitness. In this project we want to link immunity to maternal effects on physiology, behaviour and, ultimately, on the adaptive potential of an individual. To this end, we want to analyse immunoglobulin levels (IgG) in maternal plasma, egg yolk, and hatchling plasma in Japanese quail that have previously experienced different social environments (high and low social density) during reproduction. Secondly, we will test experimentally, whether the immune response to a pathogen challenge is modulated by the social environment. To this end we will house Japanese quail females within outdoor aviaries in groups or pairs. Half of the pair females will be challenged with the antigen lipopolysaccharide (LPS) during egg production. The eggs will be artificially incubated and we will perform physiological (antibody production, stress- and immune challenge) and behavioural tests on the offspring. We will investigate, whether maternal effects, induced by an immune challenge a) adaptively prime not only the immune system of the young but also cause behavioural alterations, b) whether the maternal social environment and her immune status interplay to shape the offspring phenotype and c) whether the fitness of the offspring is enhanced by the match between its own and its mother's environment.

### **Projektbeteiligte**

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