Effects of different diets on expression of immune genes in houseflies

In recent years, insects public perception of insects has been shifting from nuisance to useful commodity. Insects are for example used in biological control and as natural pollinators. Due to this growing interest in insects, the insect industry is growing fast. New legislations allowing insects to be used as feed for aquaculture and livestock, such as poultry, will only give more incentive to this growth.

Currently poultry is most often fed with soy and/or fish meal, both of which are taxing to the environment as rainforest is burned down in order to make place for soy farms and the production of fishmeal contributes to overfishing. Using insects as feed instead might provide a more sustainable solution. By using species like the housefly, that are adapted to live in varied environments, insects can even be reared for feed on substrates that are considered waste products.

Historically houseflies have been viewed as a pest and thus most of the research on houseflies has been on how to eliminate them. However, in order to efficiently upscale the production of houseflies, it is important to know how to keep them healthy. While insect immunity is well studied in fruit flies, much less is known about the immune system of houseflies. For mass rearing it is especially interesting to study the effects of different rearing conditions on housefly immunity. For example, temperature, diet and population composition can easily be regulated in mass rearing facilities.

The aim of this master project is to study the effect of diet on the functioning of the immune system in houseflies. Different types of projects are possible, depending on the ways in which the effects on the immune response are studied. One possibility is to study the differences in development and survival of the housefly larvae after immune challenge under different rearing conditions. Another possibility is to study the expression of immune genes in response to different diets using RNA extraction and qPCR.

**Methods:** Survival assays with houseflies, RNA extraction, qPCR

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**Staff member:** Bregje Wertheim  
**Daily supervisor:** Maaike Vogel  
**Expertise group:** Evolutionary Genetics, Development & Behaviour  
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