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## Master thesis subject:

### Effect of domestic hosts bloodmeals on the life traits of *Culex pipiens* populations

*Culex pipiens* species complex is a globally abundant multi-disease vector that transmits, arthropod-borne viruses to both humans and animals. Amongst other pathogens, it is a vector for West Nile virus, recently becoming endemic in also in Germany. In the frame of a project funded by the Alexander-von-Humboldt-Foundation (“Effects of larval environmental parameters and adult bloodmeal sources on the vector competence of genetically different *Culex pipiens* populations for two human-associated lineages of West Nile virus”), we are investigating the impact of environmental variations and of different blood hosts for vector competence and pathogen transmission.

### Project description

Although *Culex pipiens* complex prefers birds as blood hosts according to literature, more than 100 bird species as well as mammalian have been described as blood meal hostes. Most laboratory experiments with these mosquitoes used domestic mammalian blood sources thus far. It is unknown whether the bloodmeal preference can further impact the vector competence for pathogens.

The aim of the study is to determine the effect of both domestic birds and domestic mammals blood sources on the

- Feeding preference
- Abundance and fecundity
- Sex ration of offspring
- Development rate and growth pattern
- Longevity
- Overall survival

of *Cx. pipiens* biotype populations.

The research is carried out in Biosafety Level 2 (BSL2) insectaries in the Laboratory of Vector Capacity (<https://www.fli.de/de/institute/institut-fuer-infektionsmedizin-imed/labore/labor-fuer-vektorkapazitaet/>) in the Friedrich-Loeffler-Institut.

Blood-feeding will be done using artificial techniques (i.e. not directly on the animals). All animal bloods to be used will be molecularly screened for infections before use. All blood meals will be tested in several replicates. Survival, development time and morphological alterations will be monitored in all life stages and statistically compared.

Knowledge of the blood meal preference of the different populations of these mosquito species for domestic animals will inform the host blood to be used in laboratory colony maintenance as well as the preferred blood source for future vector competence studies. Furthermore, conclusions can be drawn for vector competence in field conditions and this will add to risk assessment of disease spread.

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Mit freundlichen Grüßen



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