

Project Title: The influence of helminths on the immunity against sexually transmitted virus infections

Supervisor: Dr. Manuel Ritter

Institute/group: Institute for Medical Microbiology, Immunology and Parasitology (IMMIP), University Hospital Bonn (UKB), AG Ritter

Webpage: <https://www.microbiology-bonn.de/en/research/ag-dr-manuel-ritter>

Requirements: MIB3 attendance of Parasitology module

Skills to be learned (max 50 words): RNA extraction of adipose and vaginal tissue, RT-qPCR, histology, mouse handling, infection experiments (filarial and viral infections) in BSL3 conditions, tissue homogenization, flow cytometry, *in vitro* cell culture, plaque assay, presentation and data analysis

Project Description (max. 150 words):

We address how parasites (helminths) influence sexually transmitted viral infections (STVIs). We aim to understand the mechanisms of how helminth infections influence vaginal immunity and pathology against viral infections like Human Papilloma (HPV) and Herpes Simplex Virus (HSV). We showed previously that helminth infections increase the risk of HPV infections, which are the major cause of cervical cancer. Using a mouse model, we could reveal that eosinophils seem to be crucial immune cell subsets for vaginal immunity and pathology against STVIs. However, their signalling mechanisms, source and distinct function remain unclear. To explore these issues, we will implement histological, immunological and molecular techniques. In detail, we will establish RNA extraction and real-time PCR analysis of inflammatory markers, apply flow cytometry techniques to assess the function, signalling mechanisms and source of the vaginal eosinophils, and will perform mouse infection experiments with distinct knockout strains (e.g., eosinophil depletion mouse strains).

Support concept (max. 75 words):

Dr. Ritter will supervise the student and practical assistance will be provided by our technician and PhD students, depending on the applied techniques. The working hours are flexible, but weekly attendance in the lab meeting (1-2h, online or in person) is required to plan the experiments. Attendance in weekly literature and result seminars is encouraged and will support presentation and language skills. Moreover, the student will be included in paper writing sessions.