

The University of Veterinary Medicine, Vienna is active in teaching and research and provides services in connection with ensuring animal health in Austria. These tasks represent our contribution to maintaining the health of humans and their animal companions as well as to producing healthy food.

Vetmeduni Vienna invites applications for up to 7 PhD positions as early graduate opportunities for selected research projects within the graduate school "Pig and Poultry Medicine" (PaP).

PhDs in Pig and Poultry Medicine

Grade: B1
Level of employment: 30 hours
Length of employment: 4 years
Deadline for applications: June 16th, 2018

The PaP graduate school was founded in 2012 and currently has about 30 collegiates. The scientific focus is research on novel control strategies of important infectious diseases of poultry and swine, including research on the foundations of host-pathogen interactions. Overall, six institutions of the Vetmeduni Vienna, two clinics and four institutes, are involved in research and training. The envisaged start of the projects is October 2018.

For details on the graduate school see: (<http://www.vetmeduni.ac.at/de/graduate-school-pig-and-poultry-medicine/>)

The university will award each PhD a 4 year funding. Salary is according to the Austrian Science Fund (www.fwf.ac.at)

Applications in the following areas are invited.

For details please use link: <http://www.vetmeduni.ac.at/de/personengruppen/jobsuchende/>

Code:	Research Area	Principal Investigator
2018/0502	Poultry Medicine: <i>Histomonas meleagridis</i> immunoproteome	Dr Ivana Bilic
2018/0503	Bacteriology: <i>Actinobacillus pleuropneumoniae</i> persistence	Prof Monika Ehling-Schulz
2018/0504	Parasitology: <i>Cystoisospora suis</i> sexual stages	Prof Anja Joachim
2018/0505	Pig Medicine: PRRS local immune responses in utero	Prof Andrea Ladinig
2018/0506	Poultry Medicine: Chicken colibacillosis	Prof Dieter Liebhart
2018/0507	Virology: PRRSV CD8 T cell epitopes	Prof Till R�umenapf

2018/0508 Immunology: Porcine T-cells

Prof Armin Saalmüller

Interviews with selected candidates will take place on-site or online from June 25th to July 6th, 2018.

A master/diploma in veterinary medicine (DVM) or a master/diploma in a life science discipline is required at the start of the course. We are looking for independent, responsible and team-oriented candidates with excellent communication skills in spoken and written English (C1). Further requirements can be found in the detailed description of the different projects.

Application should contain: application and motivation letter including the project code, full CV, and a letter of recommendation. It should be submitted electronically (preferably) to: bewerbungen@vetmeduni.ac.at (Also for informal enquiries) or by post to the Personnel Department of the University of Veterinary Medicine, Veterinärplatz 1, 1210 Vienna. Please do not forget to include the reference/code number or we shall be unable to relate your application to the correct vacancy announcement.

Vetmeduni Vienna is committed to the recruitment and advancement of female scientists.

The minimum salary for university staff is regulated by the collective contract and at the level given above amounts to EUR 2.096,-- gross per month (14 times/year). The minimum salary may be increased when previous employment and other salary components are taken into account.

Detailed descriptions of the projects

2018/0502: Immunoproteome of *Histomonas meleagridis* surface proteins. Principal Investigator: Dr Ivana Bilic, Clinic for Poultry and Fish Medicine, Department for Farm Animals and Veterinary Public Health, ivana.bilic@vetmeduni.ac.at; <http://www.vetmeduni.ac.at/gefluegelklinik/>; <http://orcid.org/0000-0003-3296-5117>

The unicellular protozoan *Histomonas meleagridis* is the causative agent of histomonosis, a severe poultry disease without effective prophylaxis and therapy in many countries worldwide which renders the devising of novel approaches a necessity. A fundamental step towards this objective is to understand the molecular basis of the host-pathogen interaction, in which the surface proteins of a pathogen present an important segment. The nature of surface proteins and their role in eliciting the host immune response in histomonosis are obscure. The present project focuses on the *H. meleagridis* immunogenic surface proteins. Immunoproteomics approach utilizing Western blotting, 1- and 2-dimensional SDS polyacrylamide gel electrophoresis (PAGE) and mass spectrometry will be undertaken to analyze purified surface proteins from different *H. meleagridis* strains. In addition, differences in surface proteins between two phenotypically different *H. meleagridis* strains will be assessed by employing 2-D difference gel electrophoresis (DIGE) and mass spectrometry approaches.

2018/0503: Role of capsule and capsule-associated proteins in persistent *Actinobacillus pleuropneumoniae* infections in swine. Principal Investigator: Prof Monika Ehling-Schulz,

Institute of Microbiology, Department of Pathobiology, monika.ehling-schulz@vetmeduni.ac.at;
<http://www.vetmeduni.ac.at/de/mikrobiologie/>; <http://orcid.org/0000-0001-7384-0594>

Actinobacillus pleuropneumoniae (APP) is the aetiological agent of porcine pleuropneumonia. Although a panoply of virulence factors contribute to the clinical outcome, the precise role of the various factors and their contribution to acute, subacute and chronic infections is far from understood. Using a biophotonic based approach, we recently identified host tissue-specific changes in capsule composition of APP, highlighting the key role of bacterial capsules in host adaptation. With the current project, we aim to identify and characterize immune-relevant antigens in the bacterial capsule. Variation in antigenic capsule proteins differentially expressed in host-adapted APP will be studied by serological proteome analysis (SERPA). Capsule fractions as well as candidate proteins will be further tested in *in vitro* re-stimulation assays to gain insights into an APP-specific immune response and host adaptation processes.

The ideal candidates should hold a master degree in life sciences, biochemistry or veterinary medicine. Practical experience in proteomic techniques is an asset. Preference will be given to applicants with experience in microbiological and molecular techniques.

2018/0504: Transcriptomic and proteomic analysis of sexual stages of *Cystoisospora suis* and functional characterization of vaccine candidates *in vitro*. Principal Investigator: Prof Anja Joachim, Institute of Parasitology, Department of Pathobiology, anja.joachim@vetmeduni.ac.at;
<http://www.vetmeduni.ac.at/parasitologie/>; <http://orcid.org/0000-0003-3082-6885>

Coccidia, including *Cystoisospora suis* which parasitizes suckling piglets, are a major group of enteric pathogens in livestock and their control by chemoprophylaxis is not sustainable, so vaccination is an attractive alternative. It is hypothesized that stage-specific antigens represent developmental bottlenecks of parasite biology and are putative vaccine targets. In this project sexually differentiated stages of *Cystoisospora suis* - gamonts and gametes - derived from *in vitro* cultures will be investigated by transcriptomic, proteomic and imaging analyses. Since *C. suis* is propagated in piglets, experience with animal models, specifically swine, as well as parasitology, would be advantageous.

2018/0505: Local NK cells in PRRSV infection at the maternal-foetal interphase. Principal Investigator: Prof Andrea Ladinig, Clinic for Swine, Department for Farm Animals and Veterinary Public Health, andrea.ladinig@vetmeduni.ac.at;
<http://www.vetmeduni.ac.at/schweine/>; <http://orcid.org/0000-0001-5037-7269>

Mechanisms of porcine reproductive and respiratory syndrome virus (PRRSV) induced reproductive failure as well as local immune responses in the maternal-foetal interphase during PRRSV infection are still poorly understood. In humans and mice it is well established that natural killer (NK) cells in the maternal-foetal interphase have regulatory functions during pregnancy and play an important role in vascular remodelling. Macrophages are the second most leukocyte subset in the human decidua and experimental data suggest that they contribute to an immune-suppressive microenvironment and may directly suppress decidual NK cells. The aim of this project is to investigate local cellular immune responses in the maternal-foetal interphase, i.e. separately within the maternal endometrium and the foetal placenta. Special

attention will be paid on the role of uterine NK cells during PRRSV infection and the interaction of NK cells and macrophages. Suitable candidates have a strong interest in swine medicine as well as sound knowledge in basic immunology. Theoretical background and practical experience in the field of swine medicine, especially in the area of infectious diseases, are an asset.

2018/0506: Induction of protective immunity against colibacillosis in chickens. Principal Investigator: Prof Dieter Liebhart, Clinic for Poultry and Fish Medicine, Department for Farm Animals and Veterinary Public Health, dieter.liebhart@vetmeduni.ac.at; <http://www.vetmeduni.ac.at/gefluegelklinik/>; <http://orcid.org/0000-0003-2412-1248>

Colibacillosis is a widespread disease of poultry that can cause high morbidity and mortality with significant economic impact and importance on public health due to the zoonotic potential of avian pathogenic *Escherichia coli* (APEC). The aim of the PhD-project is to identify relevant responses of the immune system of chickens following infection with APEC. For that the immune response in local and systemic organs at different time points after inoculation will be investigated. The applied methods will be flow cytometry analyses, histological tools together with imaging analyses and qRT-PCR. The successful applicant will join an experienced team of experts in poultry medicine and immunology and will have the opportunity to obtain skills in a wide spectrum of laboratory techniques.

2018/0507: Identification of SLA-I restricted epitopes of Porcine Reproductive and Respiratory virus (PRRSV) using a novel pestivirus expression system. Principal Investigator: Prof Till Rümenapf, Institute of Virology, Department of Pathobiology, till.ruemenapf@vetmeduni.ac.at; <http://www.vetmeduni.ac.at/virologie/>; <http://orcid.org/0000-0002-2951-7471>

The inefficacy of inactivated PRRSV vaccines suggests that SLA class I restricted CD8⁺ T-cell responses are a main pillar of PRRSV immunity. T cells recognize antigens from intracellularly replicating pathogens as small peptides presented by surface molecules encoded in the major histocompatibility complex-I of pigs, termed SLA class I. We plan to test the hypothesis that defined SLA-class I restricted epitopes of PRRSV are responsible for protection.

2018/0508: Phenotypic and functional differentiation of porcine CD8⁺ cytolytic T cells. Principal Investigator: Prof Armin Saalmüller, Institute of Immunology, Department of Pathobiology, armin.saalmueller@vetmeduni.ac.at; <http://www.vetmeduni.ac.at/de/immunologie/>; <http://orcid.org/0000-0002-7703-3252>

CD8⁺ cytolytic T lymphocytes (CTLs) play a pivotal role in the cellular immune response against viral infections. However, detailed information about phenotype and differentiation of CD8⁺ T cells in swine is sparse. In this project we aim to elucidate differentiation stages of porcine CTL from naïve CTL to effector and memory CTL. Differences in the phenotypes of the naïve and effector cells will be studied on the level of differentiation antigens, by the detection of cytolytic effector molecules and cytokines and on the level of transcription factors. CTL activity will be studied in porcine reproductive and respiratory syndrome virus-infected swine *ex vivo* and after

in vitro restimulation of virus-specific CTL with viral antigens. Thus this project should make a substantial contribution to our understanding of the differentiation of porcine CTL, enabling a detailed assessment of effector and memory CTLs in blood, tissues and organs. For this project a sound knowledge in basic immunology and dedication to laboratory work is required. Basic knowledge in flow cytometry will be an asset.

The Vetmeduni Vienna is attempting to increase the proportion of female staff, particularly in senior positions, and in accordance with § 41 of the 2002 Universities Act it is striving to attain a balanced representation of men and women, especially on its scientific staff. Applications from qualified women are thus particularly welcomed. If women are underrepresented (below 50%), female applicants who are as well qualified as the best qualified male applicants will be given preference, provided that there are no strong reasons for favouring a particular male candidate.

Applicants have no entitlement to reimbursement of any travel or accommodation costs they may incur as a result of the application procedure.

The Vetmeduni Vienna is proud to have been awarded the certificate "*hochschuleundfamilie*" (career and family). We should thus be especially pleased to receive applications from people with families. Applications from persons with disabilities are similarly welcome.