



Current Projects

[RNA-VIRT: Emerging RNA viruses and their interaction with the human and animal host](#)

The junior research group RNA-VIRT investigates the host-dependent pathogenesis of zoonotic RNA viruses using the example of the flaviviruses tick-borne encephalitis (TBE) virus and Japanese encephalitis (JE) virus.

The goal is to identify molecular factors that influence the host tropism and pathogenesis of these viruses. The results of our studies will help to identify new approaches to prophylactic and therapeutic measures.



Project summary

An important feature of zoonotic viruses is the differential pathogenesis in different susceptible hosts. While some hosts (often humans or domestic animals) can develop symptomatic disease, others do not develop any symptoms or only mild symptoms, despite their susceptibility to viral infection. A better understanding of the interaction of antigens, virulence factors and immunological reactions in animals and humans is crucial for a better detection and interpretation of host responses to viral infections. The research projects of the junior research group RNA-VIRT investigate molecular and immune-regulated host responses of different host species to tick-borne encephalitis (TBE) and Japanese encephalitis (JE) viruses. The resulting data will be used to identify protective mechanisms in natural reservoir hosts that can be transferred to other hosts for therapeutic use.

Experimental plan

The requirements for cell entry and replication of TBE and JE viruses in different hosts are assessed using subgenomic replicon-based systems. This includes the determination of the tropism and comparisons of cell adhesion, entry pathways as well as viral replication and gene expression in cells from different hosts. Viral binding affinities for cellular receptors are measured and specific differences in viral protein expression and modification detected. Furthermore, changes in cellular gene expression are determined to identify host cell factors that are selectively induced or down-regulated in flavivirus infections of different hosts. In addition, antibody profiles against selected viral antigens and functional antibody tests for the measurement of antibody-dependent cellular and systemic immune responses are used to compare humoral immune responses against TBE and JE viruses in different host species.

The research program aims at the development of new scientific concepts for the identification of prophylactic and therapeutic strategies for zoonotic infectious diseases, especially TBE and JE viruses. The approach and methods developed in the individual subprojects are also generally transferable to other viral species and families and could become part of a zoonotic preparedness program for new and emerging viruses.

Project Leader in the Research Training Group VIPER for the Project The role of flavivirus NS1 proteins in viral pathogenesis :

The general aim of the project is to test the involvement of flavivirus NS1 proteins in the impairment of endothelial barrier function observed in severe encephalitic or hemorrhagic flavivirus infections and to develop therapeutic strategies that target the NS1 protein and its host binding partners.

Coordination

Dr. Imke Steffen
Institute for Biochemistry / Research Center for Emerging Infections and Zoonoses
University of Veterinary Medicine Hannover
E-Mail imke.steffen@tiho-hannover.de
Phone +49-511-953-6112

Group Members

Veronika Breitkopf, M.Sc. Doctoral student
Laura Wiesner, M.Sc. Doctoral student
António Camarao, DVM PhD student
Carla Schmutte technical assistance
Vanessa Horn, B.Sc. Master student

Talia Schneider, B.Sc. Master student

Collaborations

Prof. Albert Osterhaus, University of Veterinary Medicine Hannover

Prof. Ulrich Kalinke, Twincore, Hannover

Prof. Martin Groschup, Friedrich-Löffler-Institut, Insel Riems

Sie sind hier: [Kliniken & Institute](#) > [Forschungszentrum für Infektio...](#) > [Research Groups and Management...](#) > [AG Steffen](#) > [Current Projects](#)

Dieses PDF-Dokument wurde dynamisch auf www.tiho-hannover.de erstellt.

Letzte Aktualisierung dieses Dokumentes: 19. Juni 2020

© Stiftung Tierärztliche Hochschule Hannover, Bünteweg 2, 30559 Hannover, Tel.: +49 511 953-60