

Open Position for CsF candidates 2013

Department/Institute: Institute of Virology

Subject Area: Veterinary Medicine

Name of Supervisor: **Prof. Dr. Klaus Osterrieder**

Number of positions: 1

Type of Positions: **PhD (Fulltime or Sandwich)**

Project title: The role of US3 in equine herpesvirus type 1 and 4 pathogenesis

Project description: Aims of the study:
Equine herpesviruses 1 and 4 (EHV-1 and EHV-4) are members of the Alphaherpesvirinae subfamily, genus Varicellovirus. Both viruses are endemic in horse populations throughout the world and causing severe economic losses. We are planning to elucidate the role of US3 virus pathogenesis, particularly, in cell cytoskeleton organization and virus transport within the cell. In addition, it is our long-term objective to define a new class of antiviral drugs, where virus entry into or replication within equine cells can specifically be blocked; likewise, a new class of vaccines may be rationally designed and engineered where viral proteins important for infection of specific compartments and/or pathogenesis are selectively targeted and modified.

Methodology:
Construction of mutant and/or recombinant viruses:
Mutant EHV-1 and EHV-4 as well as recombinant viruses where US3 will be exchanged between both viruses will be constructed. We have particularly selected US3 as it has been shown to have a role in actin cytoskeleton organization with other herpesviruses such as bovine herpesvirus type 1. The correct size and insertion or deletion of US3 will be analyzed by means of PCR, restriction fragment length polymorphism (RFLP), nucleotide sequencing, and Southern blotting.

Western blotting and immunofluorescence assay
Presence or absence of US3 expression in mutant or recombinant viruses will be tested by Western blotting and indirect immunofluorescence.

Virus growth assays
A plaque assay for measuring the efficiency of infection of generated viruses will be developed. In vitro replication assays to test the effect of mutagenesis on growth kinetics and plaque sizes will be performed.

Morphological changes and actin polymerization

Cells will be infected with mutant or parental viruses to check the role of US3 in actin microfilaments reorganization.

Technologies used during research stay

Molecular Biology: DNA or RNA extraction and quantification, cloning, restriction maps, sequencing, quantitative or qualitative PCR, directed mutagenesis.

Cell culture: primary culture (organ, tissues), cell line culture, immunofluorescence, transfection.

Virology: virus titration, virus production, purification, antibody labeling, plaque assay, growth kinetics, Western blot.

Academic Requirements:

Completion of Master or Diploma.

Language Requirements:

English

Further Information:

<http://www.vetmed.fu-berlin.de/en/einrichtungen/institute/we05/index.html>

Contact:

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Further Information on Ciência sem Fronteiras at FU Berlin

http://www.fu-berlin.de/en/sites/brazil/Ciencia_sem_Fronteiras/index.html

Application DAAD Portal:

<http://www.csf-alemanha.de/pt/>