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Master thesis subject:

Development of a new macrophage separation technique from whole blood samples.

Macrophages are specialized white blood cells differentiating from monocytes that are able to take up pathogens or cell debris in an unspecific way called phagocytosis. Macrophages are part of the first line of defense in the innate immune response and are located in almost all tissues.

In West Nile Virus infection, it is possible that these macrophages play an important role during initial infection in the skin by a mosquito bite. For these investigations we need the heterogeneous macrophage population from different vertebrate hosts without selecting only a part of the population known for antibody staining methods or the use of growth factors.

Project Description:

Your task will be the isolation of peripheral blood mononuclear cells (PBMCs) from geese, horse and human blood samples and the preparation of the monocyte fraction via adhesion and magnetic bead separation and cell staining of the different samples. The techniques should be compared with conventional separations methods like FACS analysis in the case of human blood samples. Finally, the monocytes will differentiate to macrophages and dendritic cells in cell culture and are ready for infection in the BSL3 Laboratory.

The successful development of such a technique will give us the opportunity to use an unbiased method for the isolation of macrophages and using them in infection experiments with different flaviviruses in BSL3 laboratory. This will give us an idea what happens in the initial infection phase in different hosts.

Methods:

- Cell separation by centrifugation
- Cell culture (primary eukaryotic cells)
- Cell staining
- Magnetic Bead isolation
- FACS analysis

The research will be carried out under biosafety level 2 conditions (BSL2) in the Lab of Electron Microscopy being located in the Institute of Infectology in the Friedrich-Loeffler Institute.

If you are highly motivated in getting experiences in the handling of primary immune cells during your master thesis and for further information, feel free to contact:

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Mit freundlichen Grüßen

A handwritten signature in blue ink, appearing to read 'K. Franzke', with a long horizontal flourish extending to the right.

Dr. Kati Franzke
Laborleiterin Elektronenmikroskopie