Responses of human and bovine neutrophils to Mycobacterium tuberculosis complex members

Rachana Borkute[1], Valesca Lindenberg[1], Bärbel Hammerschmidt[2], Ulrike Blohm[1], Anca Dorhoi[1]

[1] Institute of Immunology, Friedrich-Loeffler-Institut, Greifswald-Insel Riems, Germany,

[2] Department of Experimental Animal Facilities and Biorisk Management, Friedrich-Loeffler-Institut

Neutrophils and short-lived cells capable to provide defense against any encountered pathogen by producing anti-microbial molecules. Recent findings show that neutrophils cross talk with the adaptive immune cells and other phagocytes and modulate the host immune response to infections. Interaction of mycobacteria with macrophages has been characterized extensively but the role of neutrophils in tuberculosis is not well understood. Mycobacterium tuberculosis causes TB in humans and Mycobacterium bovis causes TB in cattle and acts as a zoonotic agent for humans. However, the responses of neutrophils from distant species to host-adapted mycobacteria have not been established. Our findings so far show that human neutrophils after BCG-GFP infection phagocytose more bacteria than the bovine neutrophils but if the neutrophils from the two species are fed with latex beads there is no significant difference in the phagocytic capacity. In addition, there is significant difference in ROS burst by neutrophils from human and bovine after PMA stimulation. We are currently comparing neutrophil functions from these two species after virulent Mtb H37Rv infection and in future with M. bovis AN5. This crisscross analysis would provide a basis to dissect disease mechanisms to PMN biology and may offer understanding of M. bovis infection.

Contact:

Rachana Borkute

rachanaramesh.borkute@fli.de