

Project 13: Charakterisierung der T-Zell-Makrophagen-Interaktion in einem *in vitro* *M. tuberculosis* Infektionsmodell

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Summary

Mycobacterium tuberculosis, the causative agent of human tuberculosis, persists in alveolar macrophages of infected individuals. In about 90 % of infections the immune system controls *M. tuberculosis* and protects from disease. The interaction of infected macrophages with CD4+ T cells is crucial for protective immunity and failure may lead to active tuberculosis. This project aims at establishing and optimizing an *in vitro* infection assay that enables us to decipher the underlying mechanisms of this processes and to determine the exact role of involved T-cell factors identified by own previous studies (e.g. Suppressor Of Cytokine Signaling (SOCS)-3, microRNAs). A comprehensive spectrum of methods (i.e. flow cytometry, cell culture of primary immune cells and mycobacteria, quantitative PCR) will be applied to determine the phenotype, cytokine profile and concomitant functional capacity (i.e. bactericidal, anti-proliferative activity) of T cells and macrophages. GFP-*M. bovis* BCG (derived from the vaccine strain) will be used initially to establish the assays. Afterwards virulent *M. tuberculosis* strain H37Rv will be used in this project. These experiments will be performed under safety level 3 conditions in collaboration with the group of Prof. R. Kalscheuer in the Institute of Microbiology.