1. SUMMARY

The initial control of bacterial infection depends on cells of the innate immune system. Pathogens which are opsonized by the complement system and antibodies of different isotypes are phagocytosed by granulocytes and eliminated by intracellular synthesis of reactive oxygen species (ROS). Disorders such as chronic granulomatous disease (CGD), which affect the function of granulocytes, are often associated with chronic and recurrent fungal and bacterial infections.

In the present work, the importance of fas apoptotic inhibitory molecule 3 (Faim3/Toso) was investigated by a knockout mice during infection with the bacterium *Listeria monocytogenes*. Currently, there is a controversial discussion about the functional mechanism of this transmembrane protein as anti-apoptotic molecule or a receptor for IgM.

Toso deficient mice succumbed in the early phase of infection. The specific depletion of granulocytes increased susceptibility of C57BL/6 mice for *L. monocytogenes*, while adoptive transfer of C57BL/6 granulocytes restored resistance of *Toso*$^{-/-}$ mice. For the first time expression of Toso on granulocytes and a phagocytosis depending downregulation of this protein were described. An influence of Toso for uptake of bacteria and synthesis of ROS were demonstrated *in vitro* and *in vivo*. The deletion of Toso on granulocytes reduced the IgM-dependent phagocytosis of bacteria. Furthermore, Toso increased the threshold for induction of ROS synthesis and prevented early activation and degranulation of the granulocytes in the blood. As a consequence of this dysregulation Toso deficient mice showed reduced effector functions of granulocytes in tissue and increased bacterial burden in the organs.

In the current thesis Toso has been identified as an important regulator for the activation and coordination of the effector functions in granulocytes.