

## Research Areas

1. Molecular and functional characterisation of bacterial toxins that are responsible for the course of infection in sepsis caused by Streptococcus bacteria. This involves cloning of toxins, mutagenesis of Streptococcus species, functional characterisation of the bacterial toxins in cell culture and animal models.
2. Interaction of bacterial toxins with receptors, in particular with toll-like receptors (TLR) and between receptor subunits (heterologous receptor expression, mutagenesis of receptors, analysis of recombinant protein with Biacore, immunoprecipitation).
3. Analysis of protein-protein interaction between TLR and downstream signalling molecules; Analysis of the consequence of these interactions for the transcription of proinflammatory genes (e.g. cytokine-encoding genes); Phagocytosis and antibacterial radical scavenging (heterologous expression of signal molecules, reporter analysis, FACS-based functionality tests, confocal microscopy); The molecular definition of the immune response to Streptococcus should lead to the development of rational targets of an adjuvant therapy for invasive bacterial infections.

## Collaborations

- Streptococcus-induced apoptosis in the CNS: Dr. med. Seija Lenhardt (Neuropathologie, Charité, Berlin)
- Toll-like receptor adaptor proteins: Prof. Dr. Douglas Golenbock (Univ. of Massachusetts Medical School, Worcester, MA, USA)
- Streptococcus genetics: Prof. Patrick Trieu-Cuot (Institute Pasteur, Paris Frankreich)
- Mouse model of Streptococcus pathogenesis: Prof. Giuseppe Teti (Univ. of Messina, Italien)
- Pneumococcus pathogenesis: Prof. Richard Malley (Children's Hospital and Harvard Medical School, Boston, MA, USA)
- Streptococcus diagnostics: Dr. Paul Heath (St. George's Medical School, London, UK)

## Research Sponsors

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