Project 11 (P11): Pro- and anti-inflammatoric effects of indoleamine 2,3-dioxygenase during encephalitis caused by *Toxoplasma gondii*

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Summary:
In humans infectious encephalitis is frequently due to infections by *Toxoplasma gondii*, *Staphylococcus aureus* and *Herpes simplex* virus. In the context of our project we want to investigate how an infection by one of these pathogens impairs the host defense against a co-infection by another relevant pathogen. The T cell cytokine IFN-γ is the most important inducer of antimicrobial effects. Especially in human cells IFN-γ induces the tryptophan degrading enzyme indoleamine 2,3-dioxygenase which mediates antimicrobial effects.
In previous studies we found out that *Toxoplasma gondii* as well as *Neospora caninum* are sensitive for IDO mediated antiparasitic effects. Both apicomplexa causes encephalitis in several species, share homologues proteins and stimulate a profound T cell response.
In our project we plan to define new homologous proteins between both parasites. Furthermore we will focus our interest especially on the cross recognition of these antigens by specific antibodies and by specific T cells.
Toxoplasma gondii and *Neospora caninum* are both controlled by IFN-γ induced antimicrobial effects. As an escape mechanism *Toxoplasma gondii* has developed a mechanism which is capable of interrupting the IFN-γ signalling cascade. We are interested to analyse whether or not this mechanism inhibits antimicrobial effects directed against other pathogens like *Herpes simplex* virus and *Staphylococcus aureus*. In addition we will analyse the capacity of *Neospora caninum* to mediate similar IFN-γ inhibitory effects.