

## **Borna disease virus and apoptosis resistance**

### **Background:**

Borna disease virus (BDV) is a non-segmented negative-sense RNA-virus infecting cells of the central nervous system (CNS). It is the causative agent of neurological disorders in several species, possibly including humans. In Sweden, a progressive, fatal neurological disease in cats called staggering disease ("vingelsjuka") has been linked to BDV-infection.

BDV causes a non-cytolytic persistent infection of cells in the CNS. The mechanisms behind the persistence are mostly unknown, though the virus has to be able to evade the host immune response in some way. One host immune response is to induce infected cells to undergo apoptosis. Recently, it has been shown that BDV-infected cells are more resistant to apoptosis than non-infected cells (Poenisch et al., 2009). However, we have shown that this apoptosis resistance is cell line specific (Wensman et al., 2009). This cell line difference in apoptosis resistance could be due to differences in interferon production. Which apoptotic pathway that is responsible and if BDV interferes with these is still unknown.

### **Aims:**

This project is aiming to study the apoptosis resistance in different cell lines (mainly rat astrocytoma cells and Vero monkey kidney cells) and the mechanisms behind this resistance. Results from the cell work will be applied on tissue samples from BDV-infected animals (mainly cats).

### **Methods:**

Cell culture including apoptosis induction, ELISA, RT-PCR (conventional and real-time).

### **Significance:**

Increased knowledge on the immune evasion mechanisms of BDV will help us understand the mechanisms of disease and viral persistence.

### **Supervisors:**

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### **Location:**

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### **Duration:**

10-30 weeks

### **Period:**

Starting from December-January 2009/2010 to June-August 2010, after agreement.

### **References:**

Poenisch et al., J Virol 2009 May;83(9):4297-307.

Wensman et al., Proc 8<sup>th</sup> Int Congr Vet Virol 2009:167.