## Project 1:
## Production and purification of recombinant proteins for diagnosis of Bovine Respiratory Disease

Bovine Respiratory Disease (BRD) is currently regarded as the principle health problem and the most economically important disease in calves. There are several types of infectious agents involved causing the calf to become vulnerable to this complex respiratory disease. The most common viruses involved with BRD include Bovine Viral Diarrhea Virus (BVDV), Infectious Bovine Rhinotracheitis Virus (IBRV), Bovine Respiratory Synctial Virus (BRSV), Parainfluenza Type-3 Virus (PIV3), and Bovine Coronavirus (BCoV). Currently, detection of antibodies can be done by virus neutralization test (VNT) and ELISA. VNT is time-consuming and costly. ELISA test becomes also labour intensive as one has to perform five different tests for verification of the specific virus infection. Therefore, a robust and sensitive multiplex microsphere immunoassay for detection antibodies against these viruses simultaneously is required. To obtain purified immunodomiant proteins is the key to develop such a diagnostic assay. We are producing immunodomiant proteins of BVDV and PIV3. The project will extend to express and purify of antigenic regions of IBRV, BRSV and BCoV and develop suspension immunoassay based on Luminex technology. The project will involve in

1) Cloning the targeted genes to baculovirus vector and expression of the proteins in insect cells.
2) Purification of the proteins by affinity column.
3) Development of suspension immunoassay using recombinant proteins.

**References:**

**Xia H,** Liu L, Reinhart C, Michel H, **2008**. Heterologous expression of human Neuromedin U receptor 1 and its subsequent solubilization and purification. Biochimica et Biophysica Acta 1778, 2203-2209.

**Xia H,** Liu L, Nordengrahn A, Kiss I, Merza M, Eriksson R, Bloomberg J, Belák S, **2010**. A microsphere-based immunoassay for rapid and sensitive detection of bovine viral diarrhoea virus antibodies. Journal of Virological Methods. In press.

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**Duration:**

At least 12 weeks

**Period:**

Starting after September 2010