

## **Summer Projects in the Stray Lab**

### **Project 1:**

#### **Assembly, Trafficking, and Stability of HBV Capsids in Tissue Culture**

Assembly of the HBV core particle is absolutely required for viral replication. Different aspects of HBV replication occur in the cytoplasm, the nucleus, and in the vesicular transport system. Purified core protein (Cp) alone is sufficient to assemble into core-like structures devoid of viral reverse transcriptase and genomic nucleic acid, termed capsids. We wish to develop a tissue culture model in which to study assembly, maturation, and intracellular transport of capsids. This will allow us to identify host proteins that may control the rate or extent of capsid assembly, and determine what controls the intracellular localization of HBV capsids. HBV core assembly has recently been shown to be a potential target for inhibition by novel antiviral drugs; we wish to develop a simple system for testing such drugs in tissue culture that will be amenable to large-scale drug screening.

**Techniques:** mammalian tissue culture, protein expression and purification, immunofluorescence, western blotting.

### **Project 2:**

#### **Role of Avian Antibody in Evolution of Influenza**

Both humans and birds are subject to infection with influenza A viruses. From time to time, surface antigens from avian viruses are transferred into viruses capable of infecting humans, resulting in large scale influenza infections of the human population. It is well established that influenza viruses in the human population change over time because mutant viruses which are no longer recognized by neutralizing antibody have a competitive advantage over the parental antibody-sensitive viruses. Very little information about what evolutionary forces mould influenza viruses infecting birds. Understanding how (and indeed, if) influenza viruses change in the bird population could have a significant impact not only on our ability to protect economically and ecologically

important bird species, but may prove useful in developing strategies to protect humans against novel influenza viruses which may emerge from birds.

**Techniques:** tissue culture, virus culture, antibody production and purification, PCR, DNA sequence analysis