ANSC Undergraduates Participate In the Department's Research Programs
2011- 2012 Academic Year

Ryan Pelletier, is an **ANSC senior**, who is studying *Acinetobacter baumanii in* **Dr. Kumar Venkitanarayanan's laboratory.** *Acinetobacter baumanii* is an emerging, multi-drug resistant bacterium commonly implicated in noscomial infections. *A. baumannii* has a remarkable ability to persist for prolonged periods of time in the hospital environment in biofilms, thereby insulating it from disinfectants, and serving as a continuous source of infection. Besides increasing the potential for nosocomial spread, biofilm production in *A. baumannii* also contributes to antibiotic resistance. My research investigates the ability of several plant-derived molecules to inhibit biofilm formation by *A. baumannii*. The effects of these molecules will be observed under various conditions, including several temperatures and surfaces. Findings from the project will potentially result in effective sanitation protocols which will help to prevent the establishment of *A. baumannii* biofilm and subsequent human infections.

Dana Kaelin, an **ANSC junior**, began working in **Dr. Kristen Govoni's laboratory** in Fall 2010. In addition to assisting graduate students with their research, she has worked on a large collaborative research project looking at the effects of poor maternal nutrition on the growth and development of offspring using sheep as a model. Poor maternal nutrition often leads to intrauterine growth retardation (IUGR) which can negatively impact bone and muscle development and lead to increased adipose tissue deposition. These are undesirable traits in livestock species used for production and can also contribute to health complications. Along with Sarita Neupane, a graduate student in the laboratory, Dana is evaluating the effects of IUGR on the ability of mesenchymal stem cells to differentiate into osteoblasts and adipocytes. In addition to determining if cell differentiation is altered, Dana will determine the expression of key genes involved in osteoblast and adipocyte cell function to identify potential mechanisms involved in reduced bone formation and increased fat deposition in offspring suffering from IUGR.

Derek Marotta, an **ANSC Senior**, performs research in **Dr. Cindy Tian's laboratory** in the project of generating bovine induced pluripotent stem cells. During the spring of 2010 he learned various molecular research techniques such as extraction of R/DNA, polymerase chain reaction (PCR), and agarose gel electrophoresis.

When he returned in the Fall of 2011, Derek began RNA work with graduate student, Zongliang Jiang, to characterize gene expression in bovine induced pleuripotent stem (iPS) cells. Factors, including genes like Nanog, Sox2, and Oct4 which help express pleuripotency, were used to reprogram fibroblasts to iPS cells. The goal is to conduct a characterization on the bovine iPS cells to determine if the cells were successfully reprogrammed. This is done by performing specifically designed tests, including real-time PCR analysis. The iPS cells should express similar genes to that of embryonic stem cells. Derek performed RNA extraction from 45 day old bovine fetal tissue and single bovine embryos. He is currently testing primers which code for the individual genes desired to be expressed in the iPS cells. Once this is complete, he will assist in the real-time PCR analysis. The evaluation will complete one of the four tests to characterize the pluripotency of bovine iPS cells.

Stephanie Tornaquindici, an **ANSC senior**, began her research **in Dr. Kristen Govoni's laboratory** in September 2010. Under the guidance of Maria Procopio, a Ph.D student in Animal Science, Stephanie assisted to develop primers specific for T-box 2, a key transcription factor in osteoblast function. Using these primers, she will determine if the expression of T-box 2 in various tissues is similar between mice and humans. In addition, Stephanie has assisted with a large collaborative project looking at the effects of intrauterine growth retardation (IUGR) due to poor maternal nutrition on growth and development in sheep. Specifically, Stephanie will use real-time RT-PCR to determine the expression of key genes involved in muscle development in longissimus dorsi muscle from lambs suffering from IUGR.