2022 Summer Research Program – Projects

**Dr. Brianna Beechler** - Population connectivity, ecophysiology and disease in desert bighorn sheep

Students interested in wildlife research projects can contact Dr. Beechler.

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**Dr. Lia Danelishvili** - Studying the immunogenicity of *Mycobacterium avium* subsp. *paratuberculosis* novel antigens

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**Dr. Brian Dolan -** Incorporation of Selenomethionine into antibody: implications for enhanced immune responses following selenium supplementation

Rationale: Selenium can act to improve immune responses and protect against infectious disease, but the exact mechanism remains poorly understood. We believe that the incorporation of selenomethionine into the peptide change of antibody’s protects the antibody against oxidative damage and prolongs antibody half-life, thus providing enhanced antibody-mediated immune protection.

Preliminary data: culturing hybridoma cells in selenomethionine containing media reveals incorporation of selenomethionine in purified antibody as determined by mass spectrometry.

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**Dr. Michael Huber**

Project 1: Use of a halter-attached device to remotely administer intravenous sedatives/analgesics to recumbent horses to reduce injury associated with recovery from general anesthesia.

Project 2: Comparison of two novel devices to physically delay premature efforts to stand after equine general anesthesia.

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**Dr. Ling Jin**

**Project 1: Investigation of oxidative stress in herpesvirus reactivation from latency using KHV-Koi model**

Project 2: Investigation of Ostreid Herpesvirus (OsHV-1) latent Infection in Pacific Oyster, *Crassostrea gigas*: Understanding the OsHV-1 Outbreak in Pacific Oysters

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**Dr. Jennifer Johns** – Speciation of *Trichostrongylidae*identified using a fluorescent peanut-agglutinin assay

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**Dr. Christiane Löhr -** Development and validation of adenovirus PCR and histologic review of lesions of adenovirus hemorrhagic disease (AHD) in deer in Oregon

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**Dr. Kathy Magnusson and Dr. Ling Jin -** Drs. Ling Jin and Kathy Magnusson are working on an infectious hypothesis of Alzheimer’s disease (AD).  High levels of herpesvirus-1 (HSV-1) DNA has been found in amyloid plaques in AD brains. We will examine whether reactivation of HSV-1 infection speeds up the development of the key pathologies of AD, amyloid plaques and neurofibrillary tangles. Students could receive training in inducing viral infections, PCR or plaque assays, behavioral testing in mice, and/or Western blotting.

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**Dr. Erica McKenzie** - Carpal hyperextension in Nigerian Dwarf Goats

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**Dr. Hong Moulton -** Potentiation of antisense oligonucleotide activity through use of a novel enhancement formulation

The specific objective of this project is to determine the effect of the novel formulation in biodistribution and activity of an ASO in a transgenic mouse model. The EGFP transgenic mouse model enables direct observation of ASO delivery to various organs and tissues through modification of precursor messenger RNA splicing. If effectively delivered to cells within any mouse tissue, splice-modifying ASO targeted to transcripts of the EGFP transgene cause expression of EGFP, which can then be detected and quantified through observation of EGFP fluorescence, through use of EGFP-binding antibodies or through the detection of splice-altered RNA transcript using a PCR method. Several routes of administration will be used including intravenous, intranasal, and subcutaneous. The result generated by the project is highly publishable, and it will guide us to use the novel ASO formulation in a tissue-specific manner for the development of ASO therapeutics against relevant diseases.

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**Dr. Steven Ramsey** - Bioinformatics analysis of transcriptome of canine prostate cancer

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**Dr. Daniel Rockey -** Chlamydia trachomatis intracellular biology

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**Dr. Carla Schubiger** - Increasing settlement success of oyster larvae using biologically treated substrates

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**Dr. Stacie Summers -** Evaluation of the effect of extended storage on the potency of insulins used in the management of diabetes in dogs and cats

In-use shelf life recommendations for insulin products vary based on manufacturer-generated data. In general, insulin manufacturers recommend discarding open and used vials after 4-6 weeks, however in veterinary medicine it is common practice to use vials beyond the in-use shelf life. According to the 2018 American Animal Hospital Association (AAHA) Diabetes Guidelines for Dogs and Cats, insulin products may be used beyond the date of expiration for up to 3-6 months (as long as they are stored appropriately by manufacturer standards), but this provision is based on anecdotal evidence and comes without supportive research. To date, there is no published research that has explored the percentage of pharmacologically viable insulin (potency) of opened insulin products used in companion animal medicine after prolonged storage. By keeping all other storage variables constant (temperature, light, mixing), this study will evaluate the in vitro potency of various insulins labeled for veterinary use at sequential time-points for up to 6 months after opening in order to determine if these products could be effectively used beyond the manufacturer’s listed in-use shelf-life. A veterinary student would be involved in assisting with sample collections, analysis, and abstract/manuscript writing. The student may have additional opportunities to participate in other clinical research projects over the summer with Dr. Summers in the area of small animal medicine in dogs and cats.

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**Dr. Susanne Stieger-Vanegas -** 3D modeling of portosystemic shunts

In this project, you will look at the computed tomography reports of patients with confirmed portosystemic shunts and then use their imaging data, to create representative 3D models. The goal of this project is to create “physical” three-dimensional printed models of the vasculature of the cranial abdomen of dogs with portosystemic shunts. The ideal student for this project, has some 3D modeling experience, enjoys working on a computer and learning a new computer software. In this project, you will get guidance, mentoring and supervision, but you will also be having to work independently.

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**Dr. Susan Tornquist and Dr. Natalia Shulzhenko (and in cooperation with Dr. Carlos Sanchez the Oregon Zoo)** - Elephant Microbiome – changes with chronic diarrhea and probiotics.