Mentor: Rita Cervera-Juanes, PhD  
Oregon National Primate Research Center/OHSU: Genetics Division

The Cervera-Juanes lab studies genetic and epigenetic contributions to disease, including the epigenetic risk to develop a certain disease as well as how the epigenome is modified by the disease, thus further contributing to its progress. Recent work in the Cervera-Juanes lab has identified pre-existent DNA methylation signals that predict future alcohol consumption, as well as those that are induced by chronic alcohol consumption. The lab is interested in further understanding the role these regulatory regions and associated genes plan in modulating neuroadaptations and ultimately driving addictive behaviors, such as dependence and relapse. Other work seeks to decipher the epigenetic mechanisms underlying the heritability of risk for substance use disorders (SUD), the goal being to use pharmacological or gene-mediated interventions to modulate the function of novel genes and regulatory mechanisms causative of SUD. Preliminary work in this direction is promising and shows that by modifying these novel targets, either pharmacologically or by using knock-down approaches, the alcohol intake in mice is modified. The long-term goal is to test these promising targets in non-human primates.

The student will learn general molecular techniques including DNA and RNA isolation, bisulfite conversion, reverse transcription, PCR and real-time PCR, immunohistochemistry, next-generation sequencing library preparation and data analysis.

Learn more about Dr. Cervera-Juanes’s research at [http://www.ohsu.edu/people/ritacerverajuanes/afe04aabe76c1a47772e18207891e2](http://www.ohsu.edu/people/ritacerverajuanes/afe04aabe76c1a47772e18207891e2)

Mentor: Kristine Coleman, PhD  
Oregon National Primate Research Center/OHSU: Divisions of Comparative Medicine and Neuroscience

Dr. Coleman oversees the Behavioral Services Unit (BSU) at the ONPRC. This unit is responsible for attending to the behavioral and psychological needs of the monkeys at our facility. Research in the BSU is focused on examining ways to reduce stress and improve psychological well-being for laboratory primates. Such studies have included how differences in behavioral inhibition (shyness vs. boldness) affect stress-sensitivity in macaques, how predictability affects behavioral management practices, mate selection behavior and dominance in group-housed animals, and the effects of density on group dynamics.
Students will learn behavioral methodology, including the design and use of ethograms, how to use software specifically designed for behavioral observation, and statistical methods. S/he will also learn about species specific monkey behavior and how to improve the psychological well-being of captive animals.

Learn more about Dr. Coleman’s research at http://www.ohsu.edu/xd/research/centers-institutes/onprc/scientific-discovery/scientists/kristine-coleman.cfm

Mentor: Jon Hennebold, PhD
Oregon National Primate Research Center/OHSU: Division of Reproductive & Developmental Biology

The Hennebold laboratory focuses on defining the processes occurring in the ovary that are necessary for female fertility. Based on data obtained from recent genomic studies conducted in our laboratory, our group’s research interests include defining the molecular and cellular pathways responsible for rupture of the ovarian follicle, the release of an egg that is competent to undergo fertilization and subsequently develop into a preimplantation embryo, as well as the formation of the corpus luteum. The teacher will participate in studies that ultimately contribute to the development of novel approaches to control fertility, including the identification of processes that promote fertility in women seeking to have children or for the development of non-hormonal female contraceptives. The Hennebold laboratory is also interested in Assisted Reproductive Technologies (ARTs) and the use of recently developed gene editing tools, such as CRISPR or TALENs, for creating relevant models of human disease.

The intern will perform cellular and molecular studies of the primate follicle and/or corpus luteum. The teacher/intern will have the opportunity to participate in studies designed to quantitate the level of specific mRNAs using state of the art real-time or microfluidic PCR, the expression of proteins by Western blot, and cellular localization of protein expression using immunohistochemistry. Research opportunities are also available that involve generating and testing CRISPR/TALEN gene editing reagents.

Learn more about Dr. Hennebold’s research at http://www.ohsu.edu/xd/research/centers-institutes/onprc/scientific-discovery/scientists/jon-hennebold.cfm

Mentors: Alejandro Lomniczi, PhD/Hollis Wright, PhD
Oregon National Primate Research Center/OHSU: Division of Neuroscience

The Lomniczi lab uses cellular, molecular, genetics and systems biology strategies, in addition to high-throughput approaches and computational biology methods to develop three interrelated concepts: 1) That mammalian puberty is controlled by genetic networks that, operating within different cell contexts in the neuroendocrine brain, coordinate the activity of GnRH neurons at puberty, 2) That these networks are controlled at the transcriptional level by a repressive mechanism exerted by discrete subsets of gene “silencers”, and 3) That this transcriptional regulation is under epigenetic control, i.e., a mechanism by which environmental factors (such as nutrition, man-made chemicals, changes in light/dark cycle, etc.) regulate gene activity without modifying the actual sequence of the encoding DNA.

Dr. Hollis Wright, a Staff Scientist in Lomniczi’s lab, has a PhD degree in bioinformatics and is responsible for implementing and developing a variety of computational biology methods used to gain novel insights into the biology of the pubertal process and study the behavior of the genetic networks involved in the epigenetic and transcriptional control of puberty.
The lab seeks two types of interns: Students interested in exploring and implementing all the new cell biology and genomic technologies to further investigate the neuroendocrine system and also students with particular interest in further develop bioinformatics and systems biology methods that can be used to analyze the large and diverse data sets derived from the study of this important biological process.

Learn more about research in the Lomniczi lab at [https://www.ohsu.edu/xd/research/centers-institutes/onprc/scientific-discovery/scientists/Alejandro-Lomniczi.cfm](https://www.ohsu.edu/xd/research/centers-institutes/onprc/scientific-discovery/scientists/Alejandro-Lomniczi.cfm)

**Mentor: Dr. Tatiana Shnitko**  
Oregon National Primate Research Center/OHSU: Division of Neuroscience

Cognitive functions such as memory, cognitive flexibility, self-control, learning and attention enable an individual to achieve favorable outcomes throughout the lifespan. Alcohol use and abuse might have dramatic negative consequences on the cognitive functions. In our laboratory, we use non-human primates to study alcohol-drinking behavior, effects of chronic alcohol intake on cognitive functions and whether assessment of cognitive functions in individuals might help to predict heavy alcohol us.

*The summer undergraduate research assistant will participate in experimental work that was designed to explore and compare cognitive flexibility in male and female non-human primates. S/he will learn about cognitive testing and experiment design in animal models and how the experimental results might be translated to human disorders. S/he will contribute to the research by helping with data acquisition during the experiments and post-experimental data analysis.*

Learn more about the research being conducted by Drs. Shnitko and Grant at [http://www.ohsu.edu/people/kathleengrant/afe03820f3931a669c285d2a144a8c6](http://www.ohsu.edu/people/kathleengrant/afe03820f3931a669c285d2a144a8c6)

**Mentor: Anna Roe, PhD**  
Oregon National Primate Research Center/OHSU: Division of Neuroscience

How does the brain produce perception, thought, and behavior? The laboratory of Anna Roe studies how the functional modules of the cerebral cortex (roughly 200 um in size) underlie visual and tactile perception and mediate goal directed behavior. The lab’s experimental approaches include the use of implanted ‘windows on the brain’, intrinsic optical imaging, single and multielectrode recording arrays, anatomical tracing techniques, intracortical brain stimulation with electrical, optogenetic and near infrared laser methods, fMRI, and visual and tactile illusions. The lab is very interested in technology development and brain-machine interfaces. One goal of this combined behavioral, functional, anatomical, and neuroengineering approach is in the development of future mind-machine interfaces that can restore or enhance function after injury.

*Fellowship candidates should anticipate working on analyzing large data sets (imaging, electrophysiological, and/or anatomical), be computer literate, and have budding interests in animal behavior, brain circuitry, and perception. Candidates with neuroscience, psychology, and/or engineering background and excellent computer skills are preferred.*

Learn more about the research being conducted by Dr. Roe at [http://www.ohsu.edu/xd/research/centers-institutes/onprc/scientific-discovery/scientists/Anna-Wang-Roe.cfm](http://www.ohsu.edu/xd/research/centers-institutes/onprc/scientific-discovery/scientists/Anna-Wang-Roe.cfm)
Mentor: Jeff Stanton, DVM, MA, DACLAM

Oregon National Primate Research Center/OHSU: Division of Comparative Medicine, Education & Training Unit

Dr. Stanton, Head of the Education & Training Unit, is a laboratory animal veterinarian within the Division of Comparative Medicine (DCM) at the Oregon National Primate Research Center (ONPRC). DCM is responsible for the veterinary care and management of all animals on the ONPRC campus. There are currently 8 clinical veterinarians who provide veterinary care for the nonhuman primate (NHP) population. Veterinary care includes the provision of routine preventive medicine, management of animals with clinical illness, and the provision of research support to Principal Investigators utilizing NHP animal models. DCM veterinarians also lead research projects in a number of areas aimed at improving animal health and welfare. Projects include, but are not limited to, refining animal models, assessing and improving clinical and/or surgical treatment efficacy, the impact of gut microbiome on NHP animal models, and assessing the impact of social housing status on the NHP animal model.

Students will learn a variety of research skills depending on the research project in which they participate, including data analysis, animal observation, design and use of scoring systems, and animal handling techniques and veterinary procedures. S/he will have the opportunity to work with the veterinary care staff of the ONPRC and gain an in-depth experience in the care and management of NHPs in the biomedical research environment.

Learn more about animal care at ONPRC at https://www.ohsu.edu/xd/research/centers-institutes/onprc/caring/index.cfm

Research that takes place at ONPRC/OHSU is undertaken to improve understanding of human health and disease. Animal models are essential in this pursuit, and applicants need to be aware that in certain cases invasive animal procedures are necessary. Ethical issues associated with research in humans and other animals can evoke strong controversy, yet animal research is presently our only means of answering certain critical questions that we hope will lead to improved therapies and/or cures for disease. Federal law mandates adherence to regulations that ensure our research procedures are both humane and justified in terms of their contribution to knowledge and medical practice. Persons who apply for apprenticeship positions at ONPRC should support the ethical conduct of animal research that is carried out in compliance with federal laws and regulations.