

Anne Lewis, DVM, PhD

This position will support the creation of a nonhuman primate pathology image database of digitally scanned images of microscopic slides and related materials. The selected intern will work under the direction of ONPRC veterinary pathologists and senior research technician to identify and prioritize NHP pathology material for inclusion in the database; to capture and archive whole slide scan histologic images of these specimens; and to develop and populate a widely accessible and readily searchable database comprised of the selected materials (histologic images, gross photos and associated biologic data). The database will serve as a teaching and reference resource for education of laboratory animal veterinarians, veterinary pathologists, and biomedical researchers.

This intern will use a high resolution whole slide scanning microscope to create digitized images of the microscope slides, digitize Kodachrome images and perform data entry functions to upload the digitized images and the other information into the database.

Requirements: Courses in advanced biology, preveterinary or premedical curriculum and or anatomy and physiology, pathology, histology, gross anatomy, relational databases, microscopy, image analysis. The successful applicant must be able to sit at computer for 1-2 hours at a time, and lift up to 20 pounds.

Ilhem Messaoudi, PhD

The emphasis of the Messaoudi laboratory is on understanding how the immune system ages and its impact on the immune response to infectious diseases. More specifically, we focus on two areas that the undergraduate may choose to work on:

1. Elucidating immunological deficiencies that underlie varicella zoster virus (VZV) reactivation
2. Understanding the interplay between menopause and immunity in aged women

VZV reactivation and herpes zoster: The reactivation of varicella zoster virus (VZV) results in herpes zoster, more commonly known as shingles, which causes significant morbidity and sometimes mortality in the elderly. The immunological and virological bases for VZV reactivation are poorly understood, and the currently available vaccines against VZV are not very efficacious. We have developed the first nonhuman primate animal model that recapitulates hallmarks of VZV infection in humans. We are using this animal model to identify aspects of immune senescence that contribute to herpes zoster. Furthermore, we are identifying viral genes that can either be used in subunit vaccines against herpes zoster, or be deleted to create a safer attenuated vaccine.

Ovarian senescence and its impact on immunity: Due to increasing life expectancy, women in the United States can expect to live about one third of their life after menopause. Several studies have shown that female sex hormones modulate immune function in women. However, despite intense research, we do not fully understand the impact of menopause on immune senescence. To gain a better understanding of the

impact of menopause on immune function, we are studying the effect of surgical menopause and different hormone therapy regimens on immune function in adult and middle-aged female rhesus macaques.

Jay Wright, PhD

Our lab is working to develop a nonhuman primate model for the study of ovarian cancer, with a goal of improving strategies for early detection and prevention. Summer Undergraduate Fellowship Candidates will have the opportunity to investigate the ovarian surface epithelium (OSE) in whole tissue or in cell culture. This small group of cells, the OSE, is critically important because it is the source of most ovarian cancers in women. This form of cancer has only been reported in women, nonhuman primates, and hens, so there are few animal models available. We are examining the normal OSE in nonhuman primates to learn what aspects of its natural environment (ovulation, local steroids, aging) place it at risk for malignant transformation into cancer. In addition, we are creating a gene expression database that compares the nonhuman primate OSE with cells from women with and without ovarian cancer, work we hope will lead to the identification of markers to diagnose ovarian cancer much earlier than current methods allow. The Summer Fellow will contribute to this work based on his or her interests. The project that is selected may offer experience in a number of techniques and methodological approaches that include analysis and validation of gene expression libraries, tissue sectioning and immunohistochemical labeling, handling of biological samples, culturing live cells, and general lab duties.

Our goal will be to provide resources and guidance for a Summer Candidate to experience a research environment. This includes defining an experimental hypothesis, collecting and analyzing data, and presenting the findings at the conclusion of the Fellowship.