Scott & White/Texas A&M Health Science Center
Early Career Research Experiences Program in Health Sciences

2008 MENTOR RESEARCH DESCRIPTIONS

Additional descriptions may become available before the application deadline. Check the website for updates: http://earlyresearchprogram.sw.org

Use the following descriptions to make up to three choices of mentors with whom you would like to work during the summer program. Enter your choices on the program application (page 4).

ORTHOPEDICS

Mentor: Christopher Chaput, MD, cchaput@swmail.sw.org

Description: Dr. Christopher Chaput will directly supervise the student along with resident surgeons and research coordinators. The student will likely be reviewing charts and radiographs to obtain and abstract data for the studies listed below or for similar studies. An interested student may also participate in basic science projects already underway. Most studies result in publication, which the student will be encouraged to help write. An opportunity to help create a protocol and help write a protocol may present itself. An opportunity to see an operative orthopaedic case during the rotation is the norm. The exact project will depend on what IRB approved projects are active during the June-August; however, we currently have several active projects that are in need of research support:

- Defining and recognizing Atanto-axial instability using a comprehensive trauma database
- Ischemia reperfusion injury in the murine spinal cord: opportunities for intervention in the nitric oxide synthase pathway
- Randomized, controlled trial of Gamma 3 nails for fixation of hip fractures
- Surgical management of thumb carpometacarpal osteoarthritis with ligament reconstruction and tendon interposition versus tendon interposition alone

PEDIATRICS

Mentor: Catherine McNeal, M.D., cmcneal@swmail.sw.org

Description: The student will work with Dr. McNeal on her current projects. Project assignments will depend on the phase of the project, availability of active projects, and student interests. Projects can include:

- Identifying risk factors for the development of cardiovascular disease to prevent or delay heart disease in adolescents, including developing protocols to diagnose and treat children with known risk factors such as high cholesterol, obesity, diabetes and family history of heart disease.
- Participating in clinical trial work related to the epidemiology and prevention of infectious diseases, including investigational vaccines and antimicrobials in children and adults.

- Longitudinal evaluation of pharmacy and medical claims data using the Scott and White health plan patient population database
- Conducting retrospective chart review to evaluate weight gain among children and adolescents who are prescribed psychotropic medication, and evaluating quality of life in children and adolescents with Attention Deficit Hyperactivity Disorder (ADHD)

GERONTOLGY

Mentors: Alan Stevens, PhD, astevens@swmail.sw.org

Description: The students will work on one or more intervention studies related to care of older adults with cognitive impairment or multiple chronic illnesses. Assignment to projects will depend on which projects are active during the program and on the student's interests. Project topics may include:

- The WAIT Project: A clinical trial testing the effectiveness of nursing home staff development interventions to address need-driven dementia compromised resident behaviors and the nursing home work environment. Data collection opportunities in nursing homes will be available.
- Family caregiving for persons with dementia
- Interventions to improve engagement of older patients in healthcare appointments
- Staff training and evaluation of care services in a nursing home unit specializing in geropsychiatric care

The students will work with Dr. Stevens, Dr. Hochhalter and others on the research team. Activities may include subject recruitment, data collection, secondary data analysis, participation in team meetings, grant development and manuscript preparation.

GASTROENTEROLOGY

Mentor: **Sharon DeMorrow Ph.D**

Description: The student will work on one of the active projects in the lab defining the effects and mechanisms of various agents on the growth of cholangiocarcinoma – a particular type of liver disease. The particular project will depend on the interest of the student and the priorities of the laboratory, but may include:

- The mechanism by which certain endocannabinoids (compounds that are structurally related to the active component of marijuana) modulates cancer cell growth
- The effects of the biogenic amines, dopamine and serotonin on the transformation, progression and metastatic activity of cholangiocarcinoma cells
- The effects of various naturally occurring agents called salvestrols on cholangiocarcinoma cell growth – one example of salvestrols is resveratrol, a chemical found in grapes and red wine

Students will work in the laboratory of Dr DeMorrow, using various cell biology and biochemical techniques under the day-to-day supervision of Ms Tracy Davis. The student will participate in our group meetings and will not only learn valuable laboratory skills but will also learn to work as a team to successfully complete projects and to develop the projects into grant applications and manuscripts for publication.

Neurosciences/Neuroanatomy/Neuropathology

Mentor: Lee Shapiro, PhD, lshapiro@medicine.tamhsc.edu

Description: One student will work on one or more studies related to neurogenesis in the adult brain. The student will work directly under the guidance of Dr. Shapiro, as well as with other members of his research team. The student will be involved in multiple aspects of the laboratory and will have the opportunity to broaden their general laboratory skills while also learning skills specific to the field of neuroscience. The experimental paradigms will include seizure-induced neurogenesis in the hippocampus, or olfactory system neurogenesis induced by either olfactory enrichment or focal lesions. The undergraduate researcher will learn numerous laboratory techniques that include the preparation of rodent brain specimens for tissue processing, histology, immunocytochemistry, light and confocal microscopy, data collection and analysis. The student will also be introduced to basic neuroanatomy within the context of the experiments that will be performed. These topics will be discussed at regular lab meetings, where all members of the lab will be expected to participate. The student will also learn general laboratory techniques such as the preparation of buffers and other solutions, titrations of antibodies, proper microscope slide techniques, as well as appropriate techniques for the use, handling and storage of laboratory reagents.

The student will have the option to perform behavioral analysis of rodents following experimental manipulations that include chemically induced seizures, or olfactory enrichment, as well as learning and memory tasks. It is important to stress that if the student is uneasy about working with live animals, they are not required to participate in this aspect of the research. The overall goal of summer research with Dr. Shapiro is that the student be involved in data collection on projects that will contribute to manuscripts and grants that will be submitted for peer review. Depending on the contribution level of the student relative to the submitted manuscripts, it is possible (but not guaranteed) that the student would be included as an author.

HEALTH SERVICES (Scott & White Health Plan)

Mentors: **Jim Rohack, MD**
Candus Ater, RN, cater@swmail.sw.org

Description: The student will work as part of a team at the Scott & White Health Plan on projects related to health screening and disease management. Examples of possible activities include:

- Preparing a manuscript based on data related to mammogram screening and physician visits
- Observing active disease management interventions
- Projects related to quality improvement in the student's area of interest
- Secondary data analysis

A broad range of experiences are available at the health plan. The experience can be tailored to the student's interests and discipline.

BASIC SCIENCE OF LIVER DISEASES

Mentor: **Gianfranco Alpini, PhD,** galpini@tamu.edu
Romina Mancinelli, MD, RMancinelli@medicine.tamhsc.edu
Heather Francis, hfrancis@tamu.edu

Description: The topic of this summer research position is the control of cholangiocarcinoma (liver cancer) cell growth by various factors such as growth hormones and other sex hormones. The student will be able to test the effects of various compounds from these chemical groups on the growth of cholangiocarcinoma cell lines using, molecular biology and cell biology techniques. Activities may include:

- Tissue culture – growth and maintenance of cell lines, treatment of cells in culture and various assays for measuring cell growth/cell death.
- Cell biology – immunofluorescent staining of cells, quantitation of cell cycle progression (brdU incorporation), transcription factor activity assays
- Molecular biology – real time PCR, western blotting techniques,
- Data analysis – collation and interpretation of data, basic statistical analysis, data presentation

Students will be required to maintain a laboratory notebook as an accurate record of their daily experiments. The student will be supervised in the lab by Dr Mancinelli and/or Heather Francis and will meet once per week with Dr Alpini to discuss progress.

PREVENTIVE MEDICINE/HEALTH PROMOTION

Mentor: Jennifer Hays-Grudo, Ph.D., jhaysgrudo@swmail.sw.org

Description: *Description will be added soon…*