

Rockswold Health Scholars Program Summer 2014

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Descriptions of research, clinical rotations, and health care administration roles from HCMC summer 2013 program participants and/or HCMC staff mentors.

Health Care Administration/Public Health

The health care administration position involves project work, shadowing, and interview experiences that can be tailored to fit an applicant's personal interests. By working with mentor Pam Clifford, Director of Health Care Innovation at HCMC, I was able to meet and shadow dozens of providers and administrators in order to learn more about the health care field in a hospital environment. My personal project included working with a five-person team from the Hennepin Health Foundation to create HCMC's first-ever Sustainability Report. Our Sustainability Report measured the economic, environmental, and social impact of HCMC in the Minneapolis-St. Paul community, which could then be used as a means of process improvement in the future. The ideal candidate for this position is someone who takes initiative in meeting with hospital leaders to discuss important health care issues.

-Liza Mussatto '14, Summer 2013

Clinical Rotations

The Hennepin County Medical Center Rockswold Scholars Program Clinical Rotation internship allows undergraduates to experience cutting-edge programs and patient care systems, interactions with physicians at many levels of their development including medical students, and most importantly this experience will give you an opportunity to better understand the medical world. This program is built for a dedicated and passionate learner, someone who is not afraid to ask questions and work hard. Not only are you already organized to meet with different physicians and teams every day for the ten weeks, but you also have the option of attending conferences, outside clinics, volunteer work, as well as extended hours in surgery. These are the opportunities a pre-medical student can only dream of, especially in a safety net, teaching hospital like HCMC. The clinical rotations interns work independently from each other in different departments, however the meetings with the Rockswold Scholar mentors at the hospital and the additional speaker each week is with the rest of the group. Having the luxury of speaking with dedicated and accomplished health care providers every day at HCMC provides an experience that is truly inspiring.

-Jackie Rath '14, Summer 2013

I spent 10 weeks during the summer participating in the clinical rotations. I rotated through 8 different departments, spending a week or two in each (Radiology, General Surgery, Pediatrics, Neurosurgery, Traumatic Brain Injury, Emergency Medicine, Psychiatry, OB/GYN). Throughout the course of each week I would follow several attending physicians to experience different subspecialties within each field. I also interacted with the residents and med students working under the attending physicians. Often times when the attending was busy, the residents or med students took me under their wing. I was able to follow the team around as they did rounds, checked up on patients, and performed procedures and check-ups. I always had a front row seat to the action. Aside from the clinical things during the day, I was able to attend lunchtime meetings, lectures, and conferences that the doctors and med students attended. I really felt like I was a part of the team! Those wishing to fill this position need to be prepared to be outgoing and proactive. The experience is as good as you make it. It is important to ask questions and to make sure you are not overlooked at times.

-Chris Paradise '14, Summer 2013

Research

Cardiac Biomarker Trials Laboratory – Fred Apple, PhD

The Cardiac Biomarker Trials Laboratory (CBTL), directed by Fred Apple PhD (Medical Director of Clinical Laboratories at HCMC), is primarily focused on cardiac biomarkers of ischemia towards measuring blood proteins for the detection of myocardial infarction, heart failure and for risk outcomes assessment in patients with underlying coronary artery disease. A substantial part of the lab's work is collaboration with in-vitro diagnostic companies for assay development and validation, and for clinical and analytical studies used to collect data for submission to the FDA

for 510k and PMA clearance. I worked with clinical chemists, resident physicians and fellows, research lab technicians and research nurses as they completed method comparison and reference range studies with the various immunoassay analyzers used in the central hospital laboratory and in POC analyzers used in the emergency department laboratory. By working with CBTL, I was exposed to and able to participate in part of the process of bringing a medical device to market in a hospital or clinic; including gaining an understanding of the process of enrolling subject in human research studies following approval through the hospital's IRB.

In addition, I completed my own research project using basic science techniques to detect unusual expression of a heart protein, cardiac troponin T, in skeletal and heart muscle samples. The skeletal muscle samples were from muscular dystrophy patients and marathon runners, groups who were prone to regenerating skeletal muscle and potentially expressing different proteins that would normally only be expressed in the heart. I used western blots to detect this protein expression. This was a completely self-directed project; Dr. Apple provided the idea and muscle samples but I did my own prep work to determine necessary supplies and protocols, and how to measure the success of my results.

-Maggie Flint '14, Summer 2013

Drug addiction research – Marco Pravetoni, PhD

At the Hennepin County Medical Center, I worked closely with Dr. Marco Pravetoni and his research assistants. I had the opportunity to work with the research group on the development of vaccines for addiction. My lab worked specifically on vaccines targeting prescription opioids, such as oxycodone. During my time working in the lab, I learned how to conjugate novel haptens to immunogenic carrier proteins as a basic component of vaccine design. I verified the pharmacokinetic effects of an oxycodone vaccine by giving vaccinated and non-vaccinated rats a single dose of oxycodone and collecting blood and brain for analysis of oxycodone concentrations. The vaccine blocked oxycodone distribution to brain by sequestering the drug in the serum with oxycodone specific IgG antibodies. I learned how to measure these antibodies using titer ELISA. The last component of my research experience involved rodent handling, stereotaxic surgery, and behavioral testing.

Although a majority of my time was spent working in the lab, I was able to leave the lab and spend time in the hospital on select occasions. During this time I shadowed multiple physicians, attended lectures for medical students and physicians, and learned how researchers and physicians work together to solve medical problems.

-Adam Hadro '14, Summer 2013

Chronic Disease Research Group – Charles Herzog, MD

I was in the Chronic Disease Research Group (CDRG), an organization of the Minneapolis Medical Research Foundation. Located on the 2nd and 4th floors of the Shapiro building, CDRG is an organization that focuses on biostatistics and epidemiological research for both government and private sectors. They hold government contracts for housing the United States Renal Data System and the Scientific Registry of Transplant Recipients, as well as have a 5% Medicare sample and other large data sources. They produce annual data reports and provide statistical guidance and analysis for researchers, companies and organizations conducting clinical trials. CDRG primarily uses a SAS (Statistical Analysis System) platform to analyze data, and integration with R and LaTeX is common. I was given use of a cubicle office space, complete with a computer with two monitors, basic office supplies, and enough coffee to last a lifetime. For my project, I mainly used SAS for analysis but did a few auxiliary explorations in R as well. Previous experience in coding R and other languages was extremely helpful; there would be a lot of ground to cover in learning statistical analysis programming without any prior experience. Several CDRG staff members helped me with the statistical part of my project, while Dr. Herzog primarily guided the project idea development. Other staff members served as a resource while I started learning SAS, and I was also given a SAS handbook/primer to aid in learning the program. My project was similar to a typical final project for STAT 272 or STAT 316. I had to find data (although that might change next year), clean and prepare the data for analysis, come up with an analysis plan and finally produce a written report. I presented to the CDRG and others at the end of the summer in addition to the final end of the program presentations.

-Tanya Bovitz '14, Summer 2013

Summer 2014 Project Description from CDRG staff

HCMC Summer 2014 Intern Project Concept

Stephan C. Dunning, MS, MBA

Director, Strategy and Business Development

Chronic Disease Research Group, a Division of the Minneapolis Medical Research Foundation

Seeking student(s) with interest in web programming, data visualization, graphic design, mathematics, biostatistics, and/or population health.

This is a health informatics project to understand and develop tools for visualizing aggregate population health care information for a non-technical/lay audience. It is a significant challenge to simply and concisely convey the complexities of health care information to the community of interest at large. The United States Renal Data System provides an online query web service called the Renal Data Extraction and Referencing (RenDER) System. RenDER was designed to provide users (policy-makers, researchers as well as the general public) access to basic, aggregate information about the United States End-stage Renal Disease (ESRD) population, including simple incidence and prevalence counts, demographic and geographic stratifications, proportion and rates. Currently, a system query results in an HTML table that can be exported to a spreadsheet, or if geographic data is present, presented in an online mapping interface. Developed over a decade ago, the existing RenDER interface and visualizations options are limited, outdated, and cumbersome.

For the project, the student will work both independently and with various CDRG staff (clinical, IT, biostatistics, graphic design and business) to investigate and experiment with and make recommendations on novel data visualization tools and techniques that will help CDRG staff develop new and improved web services for delivering aggregate population health information in ESRD and other disease areas. In addition to direct project work, the student will be exposed to a variety of clinical settings involving cardiovascular and kidney disease medicine, including being an observer in the cardiac ultrasound laboratory, the noninvasive stress imaging laboratory for noninvasive diagnosis of coronary artery disease, and the cardiac catheterization laboratory. *The student should have familiarity with web standards and DOM programming languages such as CSS, HTML5, javascript, etc. Some basic knowledge of the SAS and/or R statistical programming languages may also be useful, but not required.*

The student will summarize his/her findings, experimentations and recommendations in a final report and presentation to CDRG staff in addition to the final presentation for the Rockswold Health Scholars Program.