Abstract

The UCLA CTSI Research Associates Program (CTSI-RAP) provides undergraduate UCLA students with exposure to medical and clinical research in hospital-based settings. Under the collaborative guidance of UCLA faculty, students undertake CTSI research associate duties and build upon their biomedical knowledge through implementing clinical trial protocols, consenting and collecting privatized medical data, heading patient recruitment, and contributing to co-authoring papers, posters, symposium presentations, and abstracts. CTSI-RAP students also shadow UCLA physicians and nurses from the Clinical and Translational Research Center (CTRC). This enables students to become familiar to the medical experience and to garner an in-depth understanding of the various research studies initiated by UCLA investigators. CTSI’s strong mentorship allows RAP students to develop professional and communicative skills within the medical community, expand patient advocacy, and foster exposure to interdisciplinary specialties and future occupational endeavors. Additionally, RAP students experience didactic teaching at weekly meetings led by CTSI-RAP’s faculty advisors and guest lecturers through various medical ethics discussions, scientific seminars, and presentations of biomedical research methodologies and protocols. This representative blend of first-hand clinical exposure, combined with scientific research allows students an all-encompassing outlook on the challenges of healthcare and innovating biomedical research for the future in medicine.

Acknowledgements

The research described was supported by NIH/National Center for Advancing Translational Science (NCATS) UCLA CTSI Grant Number UL1TR00181.

Advisors

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CTSI-RAP Students 2018-2019

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Myocardial Infarction Biomarkers Project

PI: Linda Cai PhD. M.D.

**Background:** The Myocardial Infarction (MI) Biomarker Project is aimed at studying the relationship between myocardial infarction, or heart attacks, and netrin-1. Previous studies have established the role of netrin-1 in the signaling of the cardiovascular system as an important factor in the formation of blood vessels and in reducing ischemia-reperfusion injury by 50% while simultaneously improving cardiac functioning. Blood samples are collected from patients that have recently had a heart attack and are analyzed to examine the correlations between endogenous pathways of netrin-1-DCC signaling and characteristics of myocardial infarction. Genetic information about samples is also obtained in order to study the association between a patient’s genetic history and heart attacks.

**RAP Responsibilities:** CTSI-RAP students are paged when there is reporting of a ST-elevated myocardial infarction. From there, students then screen medical records in order to identify the patient’s eligibility for the study. If patients are eligible, research associates are responsible for consenting patients to join the study and communicating with hospital staff for the appropriate collection of biological specimens. Students also interview patients about their medical history and their family’s medical history with myocardial infarction.

Neural, Inflammatory, and Genomic Mechanisms Study

PI: George Slavich PhD.

**Major Depressive Disorder (MDD)** is one of the most prevalent and debilitating diseases affecting Americans today. Starting in adolescence, women are twice as likely to suffer from the condition as men are, making them disproportionately at risk for co-occurring diseases like heart disease, and certain cancers, and as a result, early mortality. One of the best markers of risk for MDD in female adolescents is having a mother with depression. This is the first integrative, multi-level fMRI study of both high (maternal history of depression) and low (no maternal history of depression) risk female adolescents and their responses to social stressors at the psychological, neural, physiological, molecular, and genomic levels.

**RAP Responsibilities:** RAP students participate in subject recruitment, observation of the consenting process, and guidance of subjects through experimental procedures. Students also assist with blood sample handling and processing, including the preparation for ELISA, RT-PCR, and microarray analyses. RAP students are also able to observe fMRI scanning procedures and any other experimental procedures.

Pediatric Immunodeficiency Study

PI: Donald Kohn M.D.

**Background:** This study aims to develop and implement gene therapy through hematopoietic stem cells for adenosine deaminase-deficient severe combined immunodeficiency (ADA-deficient SCID) patients between 30 days and 17 years of age. ADA-deficient SCID is a genetic disorder that affects the white blood cells of an individual’s immune system, resulting in an increased difficulty to fight off infection. Researchers extract CD34+ hematopoietic stem cells from the bone marrow of the patient for treatment, add the missing ADA gene necessary for the patient’s immune system into the stem cells, and transplant these genetically modified cells back into the patient. Follow-up studies are then conducted in order to determine the strengthening of the patient’s immune system after treatment.

**RAP Responsibilities:** Research Associates are involved in data analysis and management, in which they write case report forms and examine patients’ long-term follow-up results for review. In addition, research associates assist in completing FDA audit forms. Students also gain clinical exposure through watching clinical consent processes and procedures, including stem cell infusions, and attending weekly clinical staff meetings.

(SLE Atherosclerosis)

PI: Maureen McMahon M.D.

**Background:** Systemic Lupus Erythematosus (SLE) is a chronic autoimmune disease that affects the skin, joints, kidneys, brain, as well as many auxiliary organ systems of the body primarily affecting women between the ages of 15 and 44. The cause or causes for SLE are unknown at this time and has no known cure and there is no known cure. Patients diagnosed with SLE have been found to be at higher risk for cardiovascular diseases such as atherosclerosis (ATH). ATH is characterized by plaque buildup in the arteries, causing thickening of arterial walls and blockage of arterial blood flow. Unfortunately, the underlying mechanism for the accelerated atherosclerotic risk for SLE patients is not well understood. The current study aims to identify lipid and protein biomarkers to predict the risk of ATH in SLE patients by tracking the changes in arterial wall thickness and plaque buildup.

**RAP Responsibilities:** CTSI-RAP students have the opportunity to conduct literature searches, administer patient questionnaires, and escort patients to arm and neck ultrasound appointments within the UCLA Medical Plaza. The students also play a key role in conducting phone calls to study participants to ensure their return for follow-up testing. CTSI-RAP students also become familiar with UCLA’s electronic medical record system by accessing patient charts for data collection and analysis.