Summer Mentorship at ACRM: Immersion into Reproductive Research and Scientific Writing

June 26th – July 28th, 2017
8:30am – 5:00pm Monday - Friday
ACRM Faculty and Staff

Course Overview:
The American Center for Reproductive Medicine at Cleveland Clinic offers a unique, highly integrated, research immersion program to pre-med and medical students. This program endeavors to expose students to the fundamentals of clinical research as well as provide training in scientific writing. Students will develop an understanding of how reproductive research is conducted. They will also learn how to present their research findings in departmental meetings, prepare and present PowerPoint talks at research conferences, perform a literature search, synthesize information, and hone their public speaking skills. Our faculty consists of leading scientists, physicians and surgeons in reproductive sciences from around the world who work together to provide students with intensive exposure to translational research.

This Immersion program course encompasses the basic concepts of anatomy, physiology and selected pathologies pertaining to human reproduction and certain associated topics. It also introduces the student to the art and science of basic research, with heavy emphasis on the core principles of scientific research, both in scientific writing and bench research. This information and knowledge components will be delivered through interactive lectures, didactics, small group sessions (tutorials, demonstrations and presentations), workshops and a mini symposium. Bench research training is provided using practical demonstration and hands-on training under the daily supervision and direct mentorship of selected Mentors. Scientific writing skills are developed under the direct mentorship of selected Mentors. Presentation skills are honed during training sessions amongst all the Mentors and students, to maximize peer-learning.

The students will partake in approximately 60 hours of lab experience (bench research), 60 hours of scientific writing, and 40 hours of didactic lectures. Lab training will also be included in the program. Daily work hours will be from 8:30AM to 4:30pm, and will include a lunch break from 12:00-1:00pm. Daily morning interactive lectures/a didactic session will be held daily from Monday to Thursday for approximately one hour.

Learning Outcomes:
General Learning Outcomes:
1. Discover the Science of Medicine from reputable speakers selected for their expertise in clinical, surgical, research, and scientific fields
2. Discover the art and science of how research is conducted
3. Develop an understanding of cutting edge sciences (proteomics, genomics, molecular biotechnology, imaging)
4. Academic and soft skills assembled through the daily mentoring of research work by experienced scientists
5. Apply skills of data compilation and analysis
6. Apply statistical methods in basic and translational reproductive science research
7. Synthesize research findings into a formal oral/power point presentation
8. Discuss and defend research findings to a team of experienced scientists
9. Construct a solid foundation for a future profession in the health sciences
10. Compose the writing of scientific articles and reviews in basic science topics as well as advanced medical topics

Specific Learning Objectives:

Knowledge:
1. Explain the anatomy and normal physiological functioning of the male reproductive system
2. Explain the anatomy and normal physiological functioning of the female reproductive system
3. Classify the common reproductive pathologies in males and females
4. Discuss reactive oxygen species and correlate it to oxidative stress and the role it plays in reproductive pathologies
5. Understand the causes of male and female infertility
6. Discuss the different fertility treatment options available
7. Acknowledge research opportunities, and the process of planning and conducting a research project.
8. Familiarize basic and advanced techniques used in an andrology laboratory
9. Demonstrate team work in conducting a research project and presenting the results
10. Identify the different types of scientific manuscripts – original, peer reviewed, reviews, and book chapters
11. Outline the various steps involved in preparing a manuscript for publication purposes
12. Explain the structure of an oral presentation
13. Explain how to master the art of public speaking and list some pointers.

Skills:
1. Apply basic laboratory skills such as using a balance, micropipette, phase control, and microscope
2. Demonstrate mastery of techniques used in an andrology laboratory, such as sperm count, motility, vitality, and morphology
3. Extend participation as part of a team working on a hands-on cutting-edge bench research project in Reproductive Medicine
4. Generate an oral presentation using PowerPoint of results obtained from the research project
5. Demonstrate the ability to communicate key findings of the research project
6. Conduct an electronic database search, literature review and scientific writing of a research report

Attitude:
1. Express a keen interest in a career in medicine, be it in the research or clinical tract or in reproductive sciences or in any other specialty
2. Develop a higher level of professionalism from exposure to a state-of-the-art research environment
3. Recognize the benefits of direct mentoring from experienced researchers at a world-renowned medical institution
4. Distinguish the characteristics of successful physician-scientists from various specialties from direct interaction with these researchers

Grading:
Daily attendance will be taken. Points will be deducted from your participation grade for unexcused absences or arriving significantly late.

The grade scale is:
- 90-100% A
- 80-89% B
- 70-79% C
- 60-69% D
- 59% and below: F

Continuous assessment will be used to evaluate the different core competencies of the Internship. The Mentors will assess these components using specific scoring tools and score sheets on a continuous basis throughout the 5 weeks.

1. Participation/Theoretical Lectures:
Criteria to be evaluated include:
   1. Compulsory class attendance
   2. Participation
   3. Quiz Score

2. Scientific Writing - Three evaluation opportunities
Criteria to be evaluated include:
   1. Completion of 1st draft
   2. Plagiarism report
   3. Use of Figures, Tables, Diagrams
   4. Reference list and Endnote Library
   5. Innovative writing skills
   6. Quality of manuscript

3. Bench Research - Three evaluation opportunities
Criteria to be evaluated include:
   1. Training skills
   2. Project knowledge
   3. Teamwork
   4. Data Entry
   5. Interpretation of Data

4. Presentation Skills - Three evaluation opportunities
Criteria to be evaluated include:
   1. Delivery style
   2. Organization Clarity/Knowledge
   3. Slide quality
   4. Time management
Determination of the class participation/preparation grade will be based on the judgment of the effort the student puts into the course, and his/her growth in understanding (i.e. learning). Evaluation is based on attendance, preparation for class, participation in class, and the quality, creativity, consistency, and completeness of work. It is very unlikely that anyone who is chronically late (without a reasonable explanation), or has more than one unexcused absence, will receive an “A” grade. Attendance will be taken daily and points will be deducted for unexcused absences and late arrival. Documentation from a health care provider or The University Health Service, etc will be necessary to excuse absence.