AUGUSTA UNIVERSITY

MEDICAL COLLEGE OF GEORGIA

Office of Student and Multicultural Affairs – GB 3300

Medical Scholars Program - Augusta

Handbook

November 2017 – November 2018

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***Please note that changes/updates in the Medical Scholars Program may occur. The official version of Handbook is on the web http://www.augusta.edu/mcg/students/research.php -**

I. INTRODUCTION TO MEDICAL SCHOLARS PROGRAM

Scientific discovery is the essence of progress in health-related science and the hope in medicine for uncovering the unknown to identify treatments and cures to human disease. The Medical Scholars Program at the Medical College of Georgia offers the opportunity for all medical students in good academic standing to become engaged in a scholarly project, whether basic biomedical, clinical, or translational research, educational research, analysis of existing heath care data, or medical humanities, in close mentorship with faculty who are nationally and internationally distinguished scientists, clinicians, and academic scholars. The goals of the program are to:

- expand scholarly experiences as a means to provide an understanding of how medical knowledge is scientifically and ethically derived;
- provide an understanding of how to frame a relevant hypothesis, how to construct a testable research design, and how to evaluate critically scientific and medical data using quantitative and qualitative methods;
- provide opportunities to think creatively about solutions - to see obstacles as invitations to problem solve, typically within the context of colleagues of distinct expertise;
- provide opportunities to communicate knowledge, old and new, to colleagues through participation at local, regional, and national scientific meetings;
- provide interactive workshops to expose medical students to multiple facets encompassed within the biomedical research continuum – bench to bedside to communities and populations, and back;
- expand scholarly experiences as a means to foster an increase in the number of medical students pursuing clinical and/or translational research as a component in their clinical careers.

Program Overview

Most students choose to engage a research project during the summer (9 - 10 weeks) following completion of their first-year of medical school.

An array of research opportunities is available at the Medical College of Georgia, including:

- basic biomedical research,
- patient-oriented clinical and/or translational research,
- medical education research,
- bioinformatics and biostatistics,
- community and population healthcare services: policy development and/or analysis,
- medical humanities – ethics, history, philosophy, and literature.

The first step in the process is identification of an area of research that is of interest to you and of a faculty mentor who is working in your area of interest. If you have identified a general field of interest, but need some guidance to generate or focus possible research projects or identify appropriate mentors, please make use of the following:

- thematic areas of interest for all Biomedical and Clinical Departments and Institutes at MCG are listed in the ***Biomedical & Clinical Department Research Programs Database*** – *located on your M1 D2L site. Analogous data are also listed on-line for every clinical and basic science department/program at Medical College of Georgia at Augusta University. http://www.augusta.edu/about/directory.php.*
- ***an introduction to faculty research interest meeting for all M1 students*** is scheduled for **Monday 6 November 2017 – 4:30 to 6:30 PM, in the first year lecture hall, GB1210**: Institute, Program, and Department chairs, both basic science and clinical, will present short overviews of ongoing research directions and opportunities with the goal to provide a menu of research possibilities and enough information for you to begin to identify possible areas of interest and to have available follow up contact information.
- If your prospective mentor has had a student before, he/she will be listed along with student and research project title in the ***Medical Scholars Database: 2008-2017*** - also *located on M1 D2L site*.
- advice about mentor choice is given in a later section – *SELECTING A MENTOR.*

You should identify your research question and have finalized your choice of faculty mentor prior to the end of your first semester.

You will use the months of November 2017 - *January 2018* to craft a formal research proposal - which presents your research question/hypothesis and significance, explains your experimental design, and tells how you will evaluate your results - in collaboration with your faculty mentor.

Your research proposal and program application will need to be submitted to the Medical Scholars Program by **Wednesday 31 January 2018.** Your application needs to be accompanied by a supporting application from your mentor with submission also by **Wednesday 31 January 2018.**

Application forms with online submission site is available through the Office of Student & Multicultural Affairs, Medical Scholars Program, Student & Sponsor Application Forms, December 2017 (http://www.augusta.edu/mcg/students/research.php).

- discussion about crafting your research proposal and the process of submission are given in a later section - *Application Process.*

A single committee composed of basic science and clinical faculty review all proposals submitted to the Medical Scholars Program. Competitive stipends are awarded for successful applicants - stipend support is allocated on the basis of project merit and mentor consideration.

- discussion about the proposal review process are given in a later section - *Proposal Evaluation and Selection.*

Medical Scholars Program co-directors Drs. Lynnette Bauza (LBAUZA@augusta.edu) and Richard Cameron (RCAMERON@augusta.edu) are available to assist at any stage of the research endeavor - the planning (discussion of research interests and identification of potential mentors), the implementation (development of a research proposal), and the completion (written summary and poster presentation) of an MSP project. ***We strongly advise you to start early and plan ahead.***

Program Requirements

- Students must have successfully completed all Phase I requirements and be in good academic standing.
- Students are obligated to a full-time 40h/week commitment. No activities that conflict with this effort are permitted without approval of the mentor and the Director of Medical Scholars Program (including sponsored medical mission works). Students may not have other daytime, paid employment.
- The research project must be based on a specific hypothesis that addresses an original question. Retrospective clinical chart reviews are permitted, but only if they are designed about a specific and testable hypothesis. Findings should be subjected to statistical analysis and the conclusions of the research should support or lead to the rejection of the original hypothesis. Literature-based reviews are *not* appropriate.
- The research mentor must be a full-time faculty member, clinical and/or basic science, at the Medical College of Georgia. Qualified clinicians and basic science investigators outside the Medical College of Georgia community may serve as research mentors, but must be sponsored by a full-time faculty member at the Medical College of Georgia whose expertise lies in the field of the research work being performed. The sponsor-arrangement requires approval by the Director, Medical Scholars Program.
- No more than *two* students can be associated with a single mentor.
- Multiple student participation on a single project (shared effort) is ***not*** permitted. The student is expected, with guidance from the mentor, to develop the hypothesis and specific aims of the project, as well as to participate in the experimental design of the study. Students are expected to assume responsibility for performing experiments and interpretation of data.
- In addition to the time spent engaged in research, students are expected to participate in weekly noontime sessions that take place each Wednesday throughout the summer. These sessions are intended as interactive workshops to discuss multiple facets encompassed within the biomedical research continuum – bench to bedside to communities and populations, and back again; as well as to provide an opportunity for students to present their research ideas and work-in-progress. Please see **Appendix H** for summer 2017 schedule as an example of Wednesday discussions.

- At the conclusion of the program, each student is required to submit a ***Scholarly Abstract*** of his or her findings. The Scholarly Abstract will be placed in the Program Guide to the Annual Medical Scholars Research Day and should be submitted to the Medical Scholars Program Richard Cameron (RCAMERON@augusta.edu) by **Friday 17 August 2018**.
- At the conclusion of the program, each student is required to present his or her research findings in poster format at the **Annual Medical Scholars Research Day, scheduled for Monday, 8 October 2018 (date subject to change), J. Harold Harrison, M.D. Education Commons**.

II. EXTERNAL SUMMER RESEARCH OPPORTUNITIES, EXTRAMURAL FUNDING SOURCES, YEAR-LONG INTERNSHIPS, AND THE MD/PhD PROGRAM AT THE MEDICAL COLLEGE OF GEORGIA

There are a considerable number of summer research opportunities for students who wish to pursue training in research outside the Medical College of Georgia, or who wish to obtain extramural funding/fellowship for an internal project: for a listing, *please see* ***Appendix C.***

- external summer research opportunities and gaining support for an internal project through extramural funding both require the submission of an application with required letters of support – most have submission deadlines of mid-January or mid-February. Please, plan accordingly and see Drs. Bauza or Cameron before pursuing these options.

Students who wish to pursue more rigorous training in research beyond a 10-week summer program are encouraged to consider:

- a comprehensive year-long research experience, typically carried out between the M2 and M3 years: *please see* ***Appendix D for a listing*** and see Drs. Bauza or Cameron before considering such a program; or
- matriculation into the ***MD/PhD Program at the Medical College of Georgia*** – **(http://www.augusta.edu/mcg/mdphd/)** following completion of either the M1, M2, or M3 years: please see co-directors Drs. Lawrence Layman, MD, or Richard Cameron, PhD (LALAYMAN@augusta.edu / RCAMERON@augusta.edu) for discussion.

III. CONSIDERATIONS IN SELECTING A MENTOR

Selection of a faculty mentor is a key step to the success of your research project as well as to your overall enjoyment of the research experience. Your mentor will help you to identify a specific research question that makes a meaningful intellectual contribution and, additionally, will help you to craft a brief, but rigorous and well-defended, research proposal. The mentoring relationship is not only crucial to the success of your research experience, but also to the initial stages of your career.

- A good mentor has the time and interest to train ***you***. A good mentor is ***accessible*** and ***willing*** - willing to help you identify and discuss an appropriate research project - willing to help you craft an appropriate research plan - willing to help you problem-solve and trouble-shoot and to set and review project goals and expectations throughout your research time.
- You should discuss possible research projects with multiple prospective mentors who work in a field of interest to you and carefully choose an active, ongoing research setting where the necessary techniques and resources are already established.
- You should make every effort to meet with other members of the laboratory/environment under your consideration: technical staff, other medical students, graduate students, summer undergraduate students, post-doctoral fellows, research faculty, etc – a stimulating research environment is a real positive additional factor to consider in selecting a mentor.

There are several database resources to help you identify a research mentor:

- thematic areas of interest for all Biomedical Science and Clinical Departments and Institutes at MCG are listed in the ***Biomedical & Clinical Department Research Programs Database*** – *located on your M1 D2L site. Analogous data are also listed on-line for every clinical and basic science department/program at Medical College of Georgia at Augusta University.* (*http://www.augusta.edu/about/directory.php*)
- ***an introduction to faculty research interest meeting for all M1 students*** is scheduled for **Monday 6 November 2017 – 4:30 to 6:30 PM, in the first year lecture hall, GB1210**: Institute, Program, and Department chairs, both basic science and clinical, will present short overviews of ongoing research directions and opportunities with the goal to provide a menu of research possibilities and enough information for you to begin to identify possible areas of interest and to have available follow up contact information.
- If your prospective mentor has had a student before, he/she will be listed along with student and research project title in the ***Medical Scholars Database: 2008-2017*** - also *located on M1 D2L site*

You are strongly encouraged to discuss your mentor selection with other faculty at MCG, as well as Deans; Program, Institute and Department Chairs; Graduate and Clinical Program Directors; etc before committing to choice of mentor:

- this is particularly important if you have selected a mentor who has not had a student previously, or is at the beginning stages of defining their research program.
- new investigators may indeed make for a great mentor (often the best), but confirm first that he or she has significant time for you and that the research environment is appropriate.

IV. THE APPLICATION PROCESS

Once you have chosen a mentor, you should identify, with extensive discussion between you and your mentor, a research goal that can be addressed during the program's ten week time period.

- It is critical that you undertake a research problem that enables you to develop a sense of "personnel ownership and commitment" and that allows you to make a meaningful intellectual contribution.
- It is not necessary that the research problem or idea originate with you; the best projects for students are those that fit into the mentor's ongoing funded research efforts.
- ***RESEARCH QUESTIONS THAT USE HUMAN SUBJECTS, OR HUMAN DERIVED MATERIALS, INCLUDING CHARTS AND HUMAN SPECIMENS MUST BE PART OF AN ACTIVE PROGRAM ALREADY APPROVED BY IRB — THE IN-USE IRB PROTOCOL NUMBER NEEDS TO BE INDICATED WITH RESEARCH PROPOSAL SUBMISSION - NO EXCEPTIONS.***

After identifying a specific problem and feasible course of study, you with the help of your mentor will need to craft and submit a brief research proposal describing your research plan.

MSP Student and Mentor Application Forms

Forms are common to all applicants and are available online at Office of Student & Multicultural Affairs, **(http://www.augusta.edu/mcg/students/research.php)** - forms are available starting *Friday 15 December 2017*.

Please prepare information for application and submit through the MSP website. The application form contains essay questions and needs to be filled out at one sitting.

We suggest you complete essay texts in Word format first and then copy and paste them into the on-line form. Submission of form is final. For questions/concerns, please contact Drs. Lynnette Bauza (LBAUZA@augusta.edu) or Richard Cameron (RCAMERON@augusta.edu) The following provides a preview of the student as well as the mentor application:

Preview of the Student Application Form

STUDENT INFORMATION

- Name
- Birth Date
- Address
- Phone Number
- Cell Phone
- School Email
- Alternate Email

CITIZENSHIP

- If not a US Citizen, of what country are you a citizen?
- If you have a permanent resident alien "green card", please provide the number on the card

EDUCATIONAL BACKGROUND

Please list the colleges/universities you have attended, prior to entering the Medical College of Georgia.

- School Name
- Major
- Degree
- Graduation Date

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MENTOR INFORMATION

- Name (Title, First, Last, Suffix)
- Department
- Mentor Email
- Mentor Phone Number
- Location where work will be performed

RESEARCH PLAN NARRATIVE

- Project Title
- Project Aims (Maximum of 250 words)
- Project Background and Significance (Maximum of 500 words): summarize previous studies in the field and point out what additional studies, especially your proposed work, would add knowledge to the field.
- Research Methods and Design (Maximum of 500 words): outline what you propose to do during the summer - provide brief experimental details.
- Relevance of Research to Medicine (Maximum of 250 words)
- Please discuss what you hope to learn from participation in the Medical Scholars Program and how your participation will benefit you in meeting your future education and career goals (Maximum of 250 words).
- Selective References (enter up to 10 references): list journal articles that are referenced in the research proposal/application - i.e., the published work that supports the ideas/approach of proposed work.
- Indicate whether you have any previous research experience(s)? Yes or No

- *A later section of this Handbook provides advice that may be helpful to you in crafting your research narrative – **Appendix E**.*

SUGGESTED PRIMARY RESEARCH AREA FOR PROPOSAL REVIEW (please check)

- Children's health research
- Basic biomedical research
- Clinical and/or translational research
- Medical education research

Preview of the Mentor Application Form

MENTOR INFORMATION

- Name (Principal Investigator)
- Department
- Email
- Office Address
- Phone
- Lab Location (site of work performance)
- Lab Phone

STUDENT INFORMATION

- Name
- Student Email
- Project Title

MENTOR SUPPORT STATEMENT (mentor should provide):

- Description of ongoing research activities
- List of current research support pertinent to student's project
- Description of what the student is expected to accomplish and the mentor's role in the process
- Assurance that the student will have appropriate space to work, reasonable access to supplies, and access to the mentor's time
- Assurance that the mentor will help craft and review the Scholarly Abstract for the student's education portfolio as well as the poster for presentation at the Annual Medical Scholars Research Day – scheduled for **Monday, 8 October 2018** (date is subject to change), J. Harold Harrison, MD Education Commons.

INSTITUTIONAL COMPLIANCE INFORMATION

Where will the project be conducted?

- Medical Campus
- AU Medical Center
- Other

If the project involves human subjects, human blood or tissue, or human data, including review of charts:

- provide the existing IRB file #:
- provide the existing project title:
- provide the named PI of project:

If the project involves human subjects, human blood or tissue, or human data, including review of charts and is a new submission requiring a new IRB application, please check box:

- project requires a new IRB application

If the project involves animals:

- provide the existing IACUC file#:
- provide the existing project title:
- provide the named project PI:

If the project involves use of animals and requires a new IACUC application please check below box:

- project require a new IACUC application.

If project is performed in a laboratory:

- provide the PI's Institutional Chemical #:
- provide the address of the laboratory to be used:

If project requires use of radioisotopes:

- provide the PI's User Authorization #:

V. APPLICATION REVIEW: EVALUATION AND SELECTION FOR SUPPORT.

Proposals submitted to the Medical Scholars Program are reviewed by a committee composed of basic science and clinical faculty members with expertise among four general fields of study:

- Children's health research
- Basic biomedical research
- Clinical and/or translational research
- Medical education research

The Review Committee establishes a priority ranking for all research proposals under its review and makes recommendations for project stipend support to the Dean. The Dean's Office determines project area priorities as well as program funding line.

- Project stipend support is allocated on the basis of project merit and mentor consideration. Some criteria taken into consideration during a proposal review are indicated in ***Appendix F.***
- Note: be sure to indicate in your student application, a recommendation for the area of study that you and your mentor think best suited for evaluation of your research proposal.
- Notification of Proposal Approval and Stipend Support: **Monday 19 February 2018**.

VI. POST-AWARD REQUIREMENTS – INSTITUTIONAL COMPLIANCE COMPONENTS

Students chosen for a 2018 Medical Scholars Program award will be notified of Institutional Compliance concerns, but it is the *responsibility of the student and his/her mentor* to ensure approval of all Medical College of Georgia compliance requirements. Projects will become ineligible for funding and study unless all compliance documentation is provided by the program's starting date. Approval of compliance components takes considerable time, so submit your required elements promptly upon request. Mary Anne Park *(MPARK@augusta.edu)* and staff are available to assist you with compliance issues.

(a) *For All Medical Scholars*

- Complete a Temporary Employment Application: you can access by visiting Division of Human Resources, Talent Acquisition and Management Resources subsection: (http://www.augusta.edu/hr/talent-acquistion-management/tam-resources.php).
- Complete a Criminal History/Background Investigation Form: you can access by visiting Division of Human Resources, Talent Acquisition and Management Resources subsection: (http://www.augusta.edu/hr/talent-acquistion-management/tam-resources.php).
- Complete the Basic Awareness Training RTK with Global Harmonized System: you can access this course by visiting: (http://www.usg.edu/facilities/rtk-ghs).
- Bring (or email) completed forms for all to Mary Anne Park *(MPARK@augusta.edu* or CJ 1117).

NOTE:

- Everyone must present their **ORIGINAL** Social Security Card on the day they are hired. NO COPIES will be accepted.

- Naturalized US citizens are required to bring their **ORIGINAL** Naturalization paperwork along with their original Social Security Card.
- If you have a Green Card, the **ORIGINAL** of your Green Card is also required on hiring day.

Human Resources will make no exception. Students without appropriate identification are not allowed to work or continue in the program.

(b) ***For Medical Scholars with a project that uses Human Subjects, Human Blood or Tissues, or Human Subject Data (including review of charts)***

- Have a curriculum vita that contains a hand written signature and current date on page 1.
- Complete CITI Training, Group 1 FDA Regulated Research (if you have not already done so). You can access by viewing www.citiprogram.org. Go to: Create an account – Register. Enter Augusta University as the organization name. Follow provided instructions thereafter. Complete only CITI Learner Group One FDA Regulated Research, regardless of the type of research you will be doing. **Do not complete any other Learner Group.**

  Please note that Mary Anne Park will need a copy of your CITI completion report.
- Go to www.IRBNet.Org
- Create a new user account
- Go to your IRBNet "USER PROFILE" page. Look at the top right of your "My Projects" page.
- Click on "Add an External Account" and LINK your CITI training account, and click on send me an email.
- Your CITI ID Number is on your CITI certificate or you can locate in within the CITI Training System.
- CITI will send you verification email; go to your email and click on the link it contains to complete the process of verification. You're done with CITI.

► NOTE: CITI accounts must be linked in "External Accounts". Do not upload your CITI printout in the "Training & Credentials" section.

- Next, click on "Add a New Training & Credentials Record", scroll to the bottom of the "Document Type" drop-down menu and select *CV/Resume* or *Other*. Then locate and attach/upload your dated CV.

- When you are returned to your user profile page after attaching a document, scroll down, find your newly attached document and click on the word "Submit" at the far right. If you don't see "Pending Review" in the status column for your document, you have not submitted it.

- Check the status of all documents you have attached and confirm that they are "Pending Review" or "Accepted". If they have been rejected, call Casey Glover at the IRB Office (1-9630). Also call her if you fail in your attempt to link your CITI account.

- For questions/assistance see Mary Anne Park *(MPARK@augusta.edu* or CJ 1117).

(c) ***For Medical Scholars who have a project that uses Animals or who will access a lab or facility where Animals are housed or used***

Most of the clearance process is handled electronically. You must monitor and respond to your email promptly to avoid delays in gaining clearance. Forms should be saved, filled, and resubmitted without printing whenever possible. Please make use of the following steps:

- Principal Investigator: complete an Access Request for the Scholar,
  Step 1: (http://www.augusta.edu/research/iacuc/access.php).

- Medical Scholar: complete the Occupational Health and Safety Questionnaire,
  Step 2: (http://www.augusta.edu/research/iacuc/access.php).

- Medical Scholar: complete the LATA Training Modules – including species specific module for animal species that you will be working with,
  Step 3: (http://www.augusta.edu/research/iacuc/access.php).

- Principal Investigator: add the Scholar to your protocol in eSirius,
  Step 4: (http://www.augusta.edu/research/iacuc/access.php).

- Principal Investigator and Medical Scholar: complete the online LAS Vivarium Practices and Policies Training,
  Step 5 on Access Page: (http://www.augusta.edu/research/iacuc/access.php).

Once all other steps are complete, the DLAS Training Coordinator will contact the Medical Scholar via email to schedule in-person Laboratory Animal Training. This must be completed before you are allowed to enter a MCG lab or animal facility where animals are housed or used.

If you receive some clarification request from Tim Wilson, please return contact immediately.

(d) ***For Medical Scholars with a project that uses Human Subjects, Human Specimens, Animals or Animal Specimens, or that will be conducted in a Laboratory***

- You must attend a mandatory Chemical Safety Training class. You can register through Mary Anne Park at *(MPARK@augusta.edu)* or 1-0193.

- You must complete the Initial Biosafety and Bloodborne Pathogen Training Module. You will be assigned this course by the Biosafety Office based on the list of names provided by Mary Anne Park. Once assigned you can access this course through workforce learn online at: (http://www.augusta.edu/services/ehs/biosafe/biotraining.php).

- If you have any questions or concerns, please contact Biosafety Office: (http://www.augusta.edu/services/ehs/biosafe/).

- Bring (email) confirmation of completion forms for all to Mary Anne Park *(MPARK@augusta.edu)* or CJ 1117) - also provide a copy to your PI for the lab's records.

YOU WILL ALSO NEED TO COMPLETE THE FOLLOWING UNIVERSITY SYSTEMS TRAINING MODULES:

- Basic Awareness Training RTK with Global Harmonized System (you can access this course by visiting, http://www.usg.edu/facilities/rtk-ghs)

- Hazardous Waste Module (you can access this course by visiting, http://www.usg.edu/facilities/training/hazwaste/)

Should you have any questions about any of these requirements, do not hesitate to contact Mary Anne Park at 1-0193 or *(MPARK@augusta.edu)* or Richard Cameron at 1-8740 or RCAMERON@augusta.edu**. Additional information for institutional compliance: Appendix G.**

VII. SCHOLARLY ABSTRACT

At the conclusion of the program, each student is required to submit a ***Scholarly Abstract*** of his or her findings. The Scholarly Abstract will be placed in the Program Guide to the Annual Medical Scholars Research Day and should be submitted to the Medical Scholars Program (RCAMERON@augusta.edu) by **Friday, 17 August 2018**.

- The abstract, which needs to be approved by the research mentor, should include: the question that the research sought to answer, the approach/experiments used to test the hypothesis, the results obtained, the interpretations drawn, and the significance of the findings to medicine.

- Instructions on how to prepare a Scholarly Abstract will be presented by Dr. Richard Cameron, (RCAMERON@augusta.edu) in a summer session noontime conference.

VIII. ANNUAL MEDICAL SCHOLARS RESEARCH DAY

At the conclusion of the program, each student is required to present his or her research findings in poster format at the **Annual Medical Scholars Research Day, which is scheduled for**

Monday, 8 October 2018, (date is subject to change) J. Harold Harrison, M.D. Education Commons.

- This forum provides an important arena for you to present your work to a cross-departmental and cross-school audience of students and faculty. Many of you will use this platform as a stepping-stone to future presentations at regional, national and/or international scientific meetings.

- Your poster need not present a completed project. Ten weeks is a short period of time and it is unlikely that all will proceed as you planned at the outset, so your findings may best be discussed as "work in progress" – this is quite acceptable.

- Instructions on how to prepare and present a Research Poster will be presented by Dr. Patricia L. Cameron, Vice Dean, College of Graduate Studies (PCAMERON@augusta.edu), in a summer session noontime conference.

IX. INFORMATION FOR MENTORS OF MEDICAL SCHOLARS PROGRAM STUDENTS

The Medical Scholars Program at the Medical College of Georgia offers the opportunity for all medical students in good academic standing to engage in research activities, and considers research experiences as a valuable component of medical student education, regardless of student's ultimate career choice – academic medicine, private practice medicine, or biomedical research scientist.

The Program is offered as a six credit elective – *MEDI5088* – for completion in the fall semester. Faculty effort in the training of MSP students is reported in the Curriculum Inventory Report and may be used to demonstrate participation in the teaching mission of the Medical College of Georgia.

The following suggestions are offered to ensure a better understanding of the expectations of the research mentor's role:

- The research project must be based on a specific hypothesis that addresses an original question. Clinical chart reviews are permitted, but only if they are designed about a specific and testable hypothesis. Findings should be subjected to statistical analysis (if appropriate) and the conclusions of the research should support or lead to the rejection of the original hypothesis. Literature reviews are *not* permitted.

- For projects that lend themselves to statistical analysis, assistance will be provided through the Department of Population Health Sciences, Division of Biostatistics and Data Science (Patricia Hall, MS, pathall@augusta.edu, with financial support from the Medical Scholars Program.

- The student's project should be of a scope to ensure the likelihood that the student will

be able to obtain results that confirm or negate his/her hypothesis within the Program's timeframe – 9 to 10 weeks.

- It is not necessary that the research problem or idea originates with the student, but it is critical that the student undertakes a research problem that he/she can develop a sense of "personnel ownership and commitment" and make a meaningful intellectual contribution. The student should be expected to contribute significantly to the crafting of the research proposal under your guidance, and should not be viewed as only "a pair of hands" or "help" for another's research efforts.

- During the research period, the student and the mentor should meet at least weekly to problem-solve and trouble-shoot student efforts, and to set and review project goals and expectations.

- The mentor should facilitate the student's participation in regular laboratory meetings, journal clubs or other research activities that enhance the student's scientific and communication awareness.

- The mentor should discuss with the student how the projects goals and accomplishments should be organized and presented in the Scholarly Abstract as well as in the research poster presented at the Annual Medical Scholars Research Day.

- The mentor should be available to attend their student's presentation at the Medical Scholars Research Day to provide any necessary feedback to others in attendance.

- The mentor is responsible for all research direction and efforts as well as experimental results.

APPENDIX A

MEDICAL SCHOLARS PROGRAM COMMITTEE 2017 – 2018

David Hess, MD: Dean, Medical College of Georgia at Augusta University; Executive Vice President of Medical Affairs & Integration; Presidential Distinguished Chair; Professor, Department of Neurology, Medical College of Georgia at Augusta University, Augusta, Georgia

Paul M. Wallach, MD: Vice Dean for Academic Affairs; Professor of Medicine, Division of Internal Medicine, Medical College of Georgia at Augusta University, Augusta, Georgia

Michael P. Diamond, MD: Senior Vice President for Research, Augusta University; Associate Dean for Research, Professor and William H. Brooks, M.D. Distinguished Chair of Obstetrics and Gynecology, Medical College of Georgia at Augusta University, Augusta, Georgia

Shelley Nuss, MD: Campus Dean, AU-UGA Medical Partnership, Athens, Georgia; Professor of Medicine and Psychiatry and Health Behavior, Medical College of Georgia at Augusta University, Augusta, Georgia

Lynette Bauza, MD: Associate Dean for Students, Office of Student & Multicultural Affairs; Co-Director Medical Scholars Program; Associate Professor of Pediatrics, Medical College of Georgia at Augusta University, Augusta, Georgia

Richard S. Cameron, PhD: Co-director University System of Georgia MD/PhD Program; Co-Director Medical Scholars Program; Professor of Neuroscience and Regenerative Medicine, Medical College of Georgia at Augusta University, Augusta, Georgia

John S. Francis, MD, PhD: Campus Associate Dean for Student /Multicultural Affairs, AU-UGA Medical Partnership, Athens, Georgia

Leslie Petch Lee, PhD: Associate Dean for Campus Integration and Academic Enhancement, AU-UGA Medical Partnership, Athens, Georgia

Charles W. Linder, MD: Pediatrician-in-Chief, Children's Hospital of Georgia; Chair and Professor of Pediatrics, Medical College of Georgia at Augusta University, Augusta, Georgia

Kimberly Vess Loomer, EDD: Associate Dean for Student and Multicultural Affairs; Associate Professor of Psychiatry and Health Behavior, Medical College of Georgia at Augusta University, Augusta, Georgia

Michael P. Madaio, MD: Virgil P. Sydenstricker, MD Endowed Chair and Charbonnier Professor, Department of Medicine, Medical College of Georgia at Augusta University, Augusta, Georgia

Renuka Mehta, MBBS: President MCG Faculty Senate, Associate Professor of Pediatrics, Medical College of Georgia at Augusta University, Augusta, Georgia

APPENDIX B

MEDICAL SCHOLARS PROGRAM - IMPORTANT DATES

ACADEMIC YEAR 2017 – 2018

- Faculty research interest presentations for Basic Biomedical Science and Clinical Departments, Centers and Institutes - Monday 6 November 2017.
- Proposal Application Submission Deadline: Wednesday 31 January 2018.
- Notification of Proposal Approval: Monday 19 February 2018.
- M1 School Year Ends: Friday 11 May 2018.
- Medical Scholars Program Begins: Monday 14 May 2018.
- Medical Scholars Program Ends: Friday 27 July 2018.
- M2 School Year Begins: Monday 6 August 2018.
- Program Abstract Submission Deadline: Friday 17 August 2018.
- Program Poster Print Submission Deadline: Wednesday 12 September 2018.
- Annual Medical Scholars Day: Monday 8 October 2018 (subject to change).

APPENDIX C

EXTERNAL RESEARCH OPPORTUNITIES & EXTRAMURAL FUNDING SOURCES (some examples)

AAMC Clinical and Research Opportunities: Summer Programs // & Year-round Programs
https://www.aamc.org/cim/specialty/skillsandexperiences/clinicalandresearchopportunities/
Note: you must sign in through an AAMA Account with password protection

Alex's Lemonade Stand Foundation – Pediatric Oncology Student Training (POST) Program
http://www.alexslemona de.org/grants/post

Alpha Omega Alpha – Carolyn L. Kuckein Student Research Fellowships
www.alphaomegaalpha.org/student_research.html

American Academy of Allergy, Asthma & Immunology
www.alexslemona de.org/grants/post

American Academy of Child & Adolescent Psychiatry – Summer Medical Student Fellowships
www.aacap.org/aacap/Awards/Medical_Students_Awards/Summer_Medical_Student_Fellowships.aspx

American Academy of Dermatology – Diversity Mentorship Program
www.aad.org/members/residents-fellows-resource-center/make-a-difference/diversity-mentorship-program

American Academy of Neurology – Medical Student Summer Research Scholarship
tools.aan.com/science/awards/?fuseaction=home.info&id=58

American Association of Neurological Surgeons (AANS) – Medical Student Summer Research Fellowship
www.aans.org/Grants%20and%20Fellowships.aspx

American Association for Thoracic Surgery – Summer Intern Scholarships in Cardiothoracic Surgery
aats.org/research/grants.cgi

American Brain Tumor Association – Medical Student Summer Fellowship Program
www.abta.org/advancing -research/research- grants/

American College of Neuropsychopharmacology – Minority Summer Fellow Program
www.acnp.org/

American Federation for Aging Research Medical Student Training in Aging Research
www.afar.org/

American Gastroenterological Association Student Research Fellowship
www.gastro.org/aga-foundation/grants/aga-investing-in-the-future-iitf-student-research-fellowship

American Heart Association - the award may be completed at any accredited institution in California, Nevada, Utah, Alaska, Arizona, Hawaii, Idaho, Montana, Oregon, or Washington.
my.americanheart.org/professional/Research/FundingOpportunities/ForScientists/Winter-2015----Western-States-Affiliate-Medical-Student-Research-Program_UCM_431626_Article.jsp

American Heart Association – Student Scholarships in Cardiovascular Disease and Stroke
my.americanheart.org/professional/Councils/AwardsandLectures/Scholarship/Student-Scholarships-in-Cardiovascular-Disease-and-Stroke_UCM_322561_Article.jsp

American Parkinson Disease Association – Medical Student Summer Fellowship
www.apdaparkinson.org/research/medical-students-summer-fellowships/

American Pediatric Society & Society for Pediatric Research – Student Research Program
www.aps-spr.org/get-involved/student-research/

American Psychiatric Association – APA Minority Student Summer Externship in Addiction Psychiatry // Summer Mentoring Program
www.psychiatry.org/medical-students/electives-awards

American Skin Association – Medical Student Grants (targeting melanoma and skin cancer)
www.americanskin.org/research/seekers.php

American Society of Hematology – Minority Medical Student Award Program // and Hematology Opportunities for the Next Generation of Research Scientists Award Program
www.hematology.org/Trainees/Choose-Hematology/

American Society of Nephrology – Medical Student Research Grant
www.asn-online.org/grants/

American Society of Transplant Surgeons – ASTS Presidential Student Mentor Grant
asts.org/grants-and-research/grants/grants-and-eligibility/asts-presidential-student-mentor-grant

The Arnold P. Gold Foundation Student Summer Research Fellowship
humanism-in-medicine.org/programs/student-opportunities/student-summer-fellowships/

American Urological Foundation – Herbert Brendler, MD, Summer Medical Student Fellowship Program
www.auanet.org/research/summer-medical-student-fellowships.cfm

Betty Ford Institute – Summer Institute for Medical Students (SIMS)
www.bettyfordcenter.org/index.php

Boston Children's Hospital, Division of Newborn Medicine Summer Student Research program
www.childrenshospital.org/centers-and-services/division-of-newborn-medicine/summer-student-research-program

Child Neurology Foundation – Swaiman Medical Scholarships
www.childneurologyfoundation.org/swaiman-scholarships/

Children's Hospital Colorado – Child Health Research Internships
www.childrenscolorado.org/research/training-opportunities

Children's Hospital Los Angeles Summer Oncology Fellowship
www.chla.org/site/c.ipINKTOAJsG/b.4434829/k.8F5A/Summer_Oncology_Fellowship.htm

Cincinnati Children's Summer Medical Student Respiratory Research Fellowship
www.cincinnatichildrens.org/education/research/respiratory-research-fellowship/default/

Cleveland Clinic Center for Reproductive Medicine Summer Mentorship Program
www.clevelandclinic.org/reproductiveresearchcenter/info/traininfo_int6.html
Congress of Neurological Surgeons – Medical Student Summer Fellowship in Socioeconomic Research
www.cns.org/grants-awards/cns-foundation-fellowship-awards

Crohns and Colitis Foundation
www.ccfa.org/science-and-professionals/research/grants-fellowships/student-research-awards.html

David E. Rogers Fellowship Program – Health Care, Anesthesia/Surgical
www.nyam.org/grants/rogers.html

Emergency Medicine Foundation – Medical Student Research Grant
www.saem.org/saem-foundation/grants/what-we-fund/medical-student-research-grant

Endocrine Society – Summer Research Fellowships
www.endocrine.org/awards/research-fellowship-awards/summer-research-fellowships

Epilepsy Foundation
www.epilepsyfoundation .org/research/grant-and- fellowship- opportunities.cfm

Fellowships at Auschwitz for the Study of Professional Ethics
www.mjhnyc.org/faspe/apply.html

Fight For Sight – Summer Student Fellowship
www.fightforsight.org/Grants/Research-Award-Types/

Foundation for Anesthesia Education & Research (FAER)
faer.org/programs/ medical-student- anesthesia-research- fellowship/

Foundation for Digestive Health and Nutrition – Student Research Fellowship Awards
www.myast.org/research-funding/foundation-digestive-health-and-nutrition

Harvard University
catalyst.harvard.edu/programs/diversity/

Howard Hughes Medical Institute
www.hhmi.org/programs/medical-research-fellows-program/summer-program

Infectious Disease Society of America (IDSA) Medical Scholars Program
www.idsociety.org/Medical_Scholars_Program/

Johns Hopkins C.U.P.I.D. Summer Fellowship – Summer Translational Oncology Program
cupid.onc.jhmi.edu/

Lupus Foundation of America – Gina M Finzi Memorial Student Summer Fellowship
www.lupus.org/research/gina-m.-finzi-memorial-student-summer-fellowship-program

MD Anderson Cancer Center
www.mdanderson.org/education-and-research/education-and-training/schools-and-programs/summer-science-programs/medical-students-summer-research-program.html

Medical Student Training in Aging Research (MSTAR) Program
www.afar.org/research/funding/mstar

Medical Students' Sustained Training and Research Experience in Aging and Mental Health (M-STREAM) Program for Summer Research
mstream.ucsd.edu/programoverview.php

Melanoma Research Foundation – Medical Student Awards
www.melanoma.org/research-center/research-grants/the-grant-process

Memorial Sloan-Kettering Cancer Center
www.mskcc.org/education/students/summer-fellowship

National Institutes of Health, Medical Scholars Program
www.training.nih.gov/programs/sip

National Institutes of Health NIDDK Medical Student Research Program in Diabetes
medicalstudentdiabetesresearch.org

National Institutes of Health – National Eye Institute Summer Intern Program
www.nei.nih.gov/training/summer_intern.asp

National Institutes of Health – National Institute on Aging
www.nia.nih.gov/summer-institute-aging- research-application

National Institutes of Health, National Institute for Deafness & Other Communication Disorders
www.nidcd.nih.gov/rese arch/

National Multiple Sclerosis Society Medical Student Fellowship
www.gatewaymssociety.org

New York Academy of Medicine – Awards Fellowships and Grants
www.nyam.org/grants/

Parkinson's Disease Foundation
www.pdf.org/en/fellowship_grants

Rheumatology Research Foundation – Medical Student Research Preceptorship
www.rheumatology.org/Foundation/Awards/Medical_Student_Research_Preceptorship/

Roswell Park Cancer Institute Summer Oncology Research Programs
www.roswellpark.edu/education/summer-programs/medical/dental/pa-students

Simon Kramer Society Externship in Radiation Oncology
www.jefferson.edu/university/jmc/departments/radiation_oncology/education/Simon_Kramer_Externship.html

St. Jude Pediatric Oncology Education Program
www.stjude.org/poe

Sjorgen's Syndrome Foundation Inc
www.sjogrens.org/ home/research- programs/student- fellowships

Vanderbilt Medical Student Summer Research Training Program
www.vanderbiltsrtp.org

Wake Forest School of Medicine Institute for Regenerative Medicine, Summer Scholars Program
www.wakehealth.edu/Research/WFIRM/Summer-Scholars/Summer-Scholars-Program.htm

APPENDIX D

YEAR LONG RESEARCH INTERNSHIPS (some examples)

American Diabetes Association
Clinical Scholars Award

American Heart Association
Founders Affiliate Medical Student Research program

American Society of Nephrology
Student Scholars Grant

CDC Foundation
CDC Experience – Applies Epidemiology Fellowship (2015 uncertain)

Doris Duke Charitable Foundation
International Clinical Research Fellowship

Fogarty International Center
Fogarty Global health program for Fellows and Scholars

Fogarty International Center
Fulbright – Fogarty Fellows and Scholars in Public Health

Foundation for Anesthesia Education and Research
Medical Student Year long Fellowships

Howard Hughes Medical Institute Medical Research Fellowship Program
Medical Research Fellowship Program

Howard Hughes Medical Institute Medical Research Fellowship Program
Medical Research Year-long Program at Janelia Farms

National Institutes of Health/Fogarty Clinical Research Training Program
Overseas Fellowships in Global Health and Clinical Research

National Institutes of Health/National Institute of Diabetes & Digestive & Kidney Disease (NIDDK)
Medical Student Research Training Program

National Institutes of Health/National Institute of environmental health Sciences
Fellowships in Environmental Medicine for Medical Students

National Institutes of Health
Clinical Research Training Program

National Institutes of Health

Medical Research Scholars Program
Pharmaceutical Research & Manufacture's of America (PhRMA) Foundation
Paul Calabresi Medical Student Research Fellowship

Research To Prevent Blindness
Medical Student Fellowships

Sarnoff (Stanley J) Endowment for Cardiovascular Science
Research Training for Medical Students

APPENDIX E

SOME CRITERIA TO CONSIDER WHEN CRAFTING YOUR RESEARCH NARRATIVE

Specific Aims

- describe the research problem or question that you intend to answer.
- describe the approach that you will use to test your hypothesis.

Background and Significance

- discuss the state of knowledge in your field of investigation.
- identify existing gaps in the knowledge of your field of study.
- discuss how your investigations will fill the existing gaps and further advance the field of study.

Research Methods and Design

- discuss in sufficient detail how you will accomplish each Specific Aim.
- identify appropriate methodology, but do not let the specifics of the methodology become the focus of your proposal.
- discuss the strengths and weaknesses of your approach.
- discuss how you will analyze your data as it relates to your hypothesis.

Anticipated Results

- discuss anticipated outcomes and potential difficulties that you might encounter in your study and how you will overcome those difficulties.
- discuss how you will interpret the outcome of your study as it relates to your hypothesis.

Relevance of Research to Medicine

- discuss how your research lends itself to progress in the field of medicine: e.g., elucidation of a basic mechanism of disease; health care practice or policy; community health care or policy; world health care or policy; etc.

Selective References

- selected references should convey the context and validity of your research question and experimental design – it is not intended to be a literature review.

Personal Statement

- discuss what you hope to learn from participation in the program and how your participation will benefit you in meeting your future educational and career goals.

** Review carefully your proposal application to ensure that it contains all requested elements prior to submitting it as a single document. Applications with missing components will not be reviewed.

APPENDIX F

SOME CRITERIA UNDERLYING RESEARCH PROPOSAL EVALUATION

Faculty mentor consideration:

- Is the research setting appropriate:
  - are necessary instrumentations available on-site or within MCG Core Facilities?
  - are the experimental techniques/approaches established?
  - are the reagents on-hand or readily available?
  - are the appropriate numbers of clinical subjects available?
  - are Institutional Compliance issues addressed?
- Is the faculty oversight and interaction time with the student sufficient?
- Is the faculty mentor's experience/background appropriate for the project?

Student consideration:

- Has the student demonstrated scholarship and promise for achievement in medicine?
- Are the intellectual and/or personal motivations for wanting to participate in the program thoughtful and meaningful to scholarship in medicine?
- Will participation in the program provide a meaningful educational value to the student?
- Does the project have the potential for the student to make a meaningful intellectual contribution to the field of study?

Specific Aims and Hypothesis:

- Is the hypothesis appropriately framed?
- Are Specific Aims appropriate to the investigation of given hypothesis?

Background:

- Is the research question discussed in context to the existing status of the field?
- Does the study address an important problem?
- Do research findings have the potential to advance the field of study?
- Is the literature sited relevant to problem of study and representative to the field of study?

Research Methods and Design:

- Are the methods of analysis appropriate to the experimental objectives of proposed study?
- Is sufficient detail provided to indicate an understanding of the advantages and disadvantages of experimental approach?
- Are anticipated and alternative possible outcomes indicated and discussed with respect to the hypothesis?

Overall Approach:

- Is the proposed project feasible?
- Is the ten-week timeline appropriate to accomplish research objectives?

APPENDIX G

ADDITIONAL INFORMATION FOR INSTITUTIONAL COMPLIANCE

Please review thoroughly with your mentor all compliance information by clicking on the following web sites. Mary Anne Park, MSN, Clinical Associate Professor, Department of Surgery, Division of Clinical and Translational Science, CJ 1117, 706-721-0193, MPARK@augusta.edu is available to assist all students and mentors with compliance issues.

Research Development Services (RDS)

RDS provides services and resources to conduct clinical research at the Augusta University. The RDS office provides a review and analysis of all studies that utilize AU Health, Inc. resources. The goal of the review is to ensure efficient study start-up and allocation of resources. The Clinical Trials Office (OTS) offers clinical research services that include study personnel, nurse clinicians, and the financial management of study accounts.

Environmental Health & Safety

The mission of the Augusta University Environmental Health and Safety Division (EH&S) is to provide environmental safety services to staff, patients, students and visitors. The six sections of EH&S -- Administration, Biological Safety, Chemical Safety, Environmental Health & Occupational Safety, Fire Safety, and Radiation Safety -- ensure full compliance with all local, state and federal laws. We strive to continually improve the level and quality of services provided through creativity, teamwork and innovation.

Institutional Review Board (IRB)

The Institutional Review Board (IRB) is charged with reviewing all research studies involving human subjects. This includes, but is not limited to Humans, Records, Surveys, Tissues or other human derived materials. This applies to all research conducted at MCG, AU Health Inc, and Charlie Norwood VA Medical Center or by faculty, staff or students of those institutions. The IRB also reviews off-campus research conducted by faculty, staff or students of those entities and non-AU researchers using AU facilities.

Human Research Protection

The IRB Office provides an internal monitoring function and educational forum for the Medical College of Georgia to assure that all clinical studies utilizing human subjects and/or human derived materials comply with federal, state and institutional regulations and policies to protect research subjects, the university and the research team.

Institutional Animal Care and Use Committee

To comply with federal laws governing the humane care and treatment of laboratory animals, the Augusta University requires that all uses of invertebrate and vertebrate animals for research, education, or for any other purpose be approved by the Institutional Animal Care and Use Committee (IACUC). The IACUC consists of members of the faculty, administration, and community. Any use of animals at GRU without IACUC approval is a violation of AU policy and

federal law.

Institutional Biosafety Committee

The purpose of the Augusta University Institutional Biosafety Committee (IBC) is to ensure institutional compliance with laws and regulations governing research with biohazardous materials to include pathogenic microorganisms, infectious materials, recombinant DNA, and select agents; to establish policies, procedures, and practices to ensure that research at AU does not present unacceptable risks to the health or safety of faculty, staff, students, visitors, or the general public; and finally, to assist researchers in safely conducting research with biohazardous materials.

Institutional Chemical Committee

In an effort to meet the challenges, the Institutional Chemical Safety Committee works with the Chemical Safety Office to provide a forum for the exchange of ideas in development of safe work practices in laboratories and fostering cooperative efforts between laboratory workers and support services. Their objective is to ensure safety of all employees, students, and visitors at the Augusta University and to achieve full regulatory compliance campus wide.

***** Please note that your proposal must have documentation of approval (protocol number) for all required institutional compliances – research involving human subjects / research involving animal subjects / research involving recombinant DNA and biohazards / research involving use of radioisotopes / research involving use of high hazard chemicals - BEFORE any project can begin and BEFORE any stipend funds will be released.***

APPENDIX H

MEDICAL SCHOLARS PROGRAM SUMMER SESSIONS 2017

Session I: Participating in Research as a Medical Student - WHY?

Wednesday - 17 May 2017
12:00 to 1:00 PM
BI 4081, Surgical Amphitheater, 4th floor of hospital

- Case Study: given data: patient symptomology, electrocardiogram, chest films (frontal & lateral), and TEM-nasal biopsy.

- Discussion: disease as disturbance at the cellular level.

Background Readings

- Afzelius BA. 1976. A human syndrome caused by immotile cilia. Science, 193:317-319.

- Ciancio N, de Santi MM, Campisi R, Amato L, Di Martino G, Di Maria G. 2015. Kartagener's syndrome: review of a case series. Multidisciplinary Respir Med 10:18.

- Corradini S, Salzburg PMU, Lieberman G. Kartagener's Syndrome. Harvard Medical School, http://eradiology.bidmc.harvard.edu/LearningLab/central/Corradini.pdf.

- Fliegauf M, Benzing T, Omran H. 2007. When cilia go bad: cilia defects and ciliopathies. Nat Rev Mol Cell Biol., 8:880-893.

- Horani A, Ferkol TW, Dutcher SK, Brody SL. 2016. Genetics and biology of primary ciliary dyskinesia. Ped Respir Rev, 18: 18-24.

- Hosie P, Fitzgerald DA, Jaffe A, Birman CS, Morgan L. 2014. Primary cilia dyskinesia: overlooked and undertreated in children. J Ped and Child Health 50:952-958.

- Leigh MW, Pittman JE, Carson JL Ferkol TW, Dell SD, Davis SD, Knowles MR, Zariwala MA. 2009. Clinical and genetic aspects of primary cliiary dyskinesia/Kartagener syndrome. Genetics Med., 11:473-487.

- Li Y, Klena NT, Gabriel GC, Liu X, Kim AJ, Lemke K, Chen Y, Chatterjee B, Devine W, Dameria RR, et al. 2015. Global genetic analysis in mice unveils central role for cilia in congenital heart disease. Nature 521: 520-524.

- Theegarten D, Ebsen M. 2011. Ultrastructural pathology of primary ciliary dyskinesia: report about 125 cases in Germany. Diag Pathol, 6:115

- Zhou F, Roy S. 2015. SnapShot: Motile cilia. Cell 162.

Session II: Human Subject Research Ethics – An Overview of Doctrines and Documents

Wednesday – 24 May 2017
12:00 to 1:00 PM
BI 4081, Surgical Amphitheater, 4th floor of hospital

Readings for Discussion (see attached PDF files)

- Brandt AM. 1978. Racism and Research: The Case of the Tuskegee Syphilis Study. The Hasting Center Report 8, 21-29.

- The Nuremberg Code

- Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects, v 2013.

- The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research. 1979. The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. 1979. Washington, DC, Department of Health, Education, and Welfare. Please see Common Rule (Federal Policy for the Protection of Human Subjects) 45 CFR 46 as update to Belmont Report.

- Beecher HK. 1966. Ethics and Clinical Research. N Engl J Med 274:1354-1360.

Optional Readings

- Guideline for Good Clinical Practice, E6(R1). U.S. Department of Health and Human Services Food and Drug Administration. Center for Drug Evaluation and Research (CDER). Center for Biologics Evaluation and Research (CBER) April 1996 ICH.

- Handbook for Good Clinical Research Practice (GCP) – Guidance for Implementation.

Session II: Scientific and Medical Challenges to Addressing Emerging Disease States – Revisiting the Zika Virus

Wednesday – 31 May 2017

12:00 to 1:00 PM
BI 4081, Surgical Amphitheater, 4th floor of hospital

Readings for Discussion [see attached PDF files]

- Uraki R, Hwang J, Jurado KA, Householder S, Yockey LJ, Hastings AK, Homer RJ, Iwasaki A, Fikrig E. 2017. Zika virus causes testicular atrophy. Sci Adv 3:e1602899.

- Govero J, Esakky P, Scheaffer SM, Fernandez E, Drury A, Platt DJ, Gorman MJ, Richner JM, Caine EA, Salazar V, Moley KH, Diamond MS. 2016. Zika virus infection damages the testes in mice. Nature 540:438-443.

- Ma W, Li S, Ma S, Jia L, Zhang F, Zhang Y, Zhang J, Wong G, Zhang S, Lu X, Liu M, Yan J, Li W, Qin C, Han D, Qin C, Wang N, Li X, Gao GF. 2016. Zika virus cause testes damage and leads to male infertility in mice. Cell 167: 1511-1524.

Background Readings – Basic Science of Mouse Model

- Lazear HM, Govero J, Smith AM, Platt DJ, Fernandez E, Miner J, Diamond MS. 2016. A mouse model of Zika virus pathogenesis. Cell Host & Microbe 19:720-730.

- Previous MSP session readings, 1 June 2016: Zika virus epidemiology, Zika virus basic biology, Zika virus associated birth defects and evidence for causality, Zika virus experimental models of pathogenesis, and Zika virus and microcephaly - disruption of cortical neural progenitor cell development.

    - Cugola FR, Fernandez IR, Russo FB, Freitas B, Dias JLM, et al. 2016. The Brazilian Zika virus strain causes birth defects in experimental models. Nature, 534:267-271.

    - Li C, Xu D, Ye Q, Hong S, Jiang Y, Liu X, Zhang N, Shi N, Qin C-F, Xu Z. 2016. Zika virus disrupts neural progenitor development and leads to microcephaly in mice. Cell Stem Cell 19:1-7.

    - Tang H, Hammack C, Ogden SC, Wen Z, Qiann X, et al. 2016. Zika virus infects human cortical neural progenitors and attenuates their growth. Cell Stem Cell 18:587-590.

Session IV: Human Subject Research Ethics – Case Studies

Wednesday – 7 June 2017
12:00 to 1:00 PM
BI 4081, Surgical Amphitheater, 4th floor of hospital

Readings for Discussion - Case Study I [see attached PDF files (RSC)]

- Leroy V, Karon, JM, Alioum A, Ekpini ER, van de Perre P et al., 2003. Postnatal transmission of HIV-1 after a maternal short course zidovudine peripartum regimen in West Africa. AIDS 2003, 17:1493-1501.

- Mofenson LM, Lambert JS, Stieham ER, Bethel J, Meyer WA, 1999. Risk factors for perinatal transmission of human immunodeficiency virus type 1 in women treated with zidovudine. N Engl J Med, 341: 385-393.

Background Readings

- Connor EM, Sperling RS, Gelber R, Kiselev P, Scott G, O'Sullivan MJ, et al. 1994. Reduction of maternal-infant transmission of human immunodeficiency virus type 1 with zidovudine treatment. N Engl J Med, 331:1173 – 1180.

- Shaffer N, Chuachoowong R, Mock PA, Bhadrakom C, Siriwasin W, et al., 1999. Sort course zidovudine for perinatal HIV-1 transmission in Bangok, Thailand: a randomized control trial. The Lancet, 53:773-780.

- Sperling RS, Shapiro DE, Coombs RW, Todd JA, Herman SA, et al., Maternal viral load, zidovudine treatment, and the risk of transmission of human immunodeficiency virus type 1 from mother to infant. N Engl J Med, 335: 1621- 1629. (– a detailed follow up to Connor et al.)

Reading for Discussion - Case Study II [see attached PDF files (Lauren East)]

- Discussion Reading: Quinn TC, Wawer MJ, Sewankambo N, Serwadda D, Li C, et al. 2000. Viral load and heterosexual transmission of human immunodeficiency virus type 1. N Engl J Med, 921-929.

Session V: Responsible Conduct of Research

Wednesday - 14 June 2017
12:00 to 1:00 PM
BI 4081, Surgical Amphitheater, 4th floor of hospital

Readings for Discussion [see attached PDF files]

- On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition, 2009. Committee on Science, Engineering, and Public Policy, National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. The National Academies Press. 82 pages.

- ORI Introduction to the Responsible Conduct of Research. Revised Edition 2007. Department of Health and Human Services, Washington, DC 20402-0001.

- Collins FS, Tabak LA. 2014. NIH plans to enhance reproducibility. Nature, 505:612-613.

- Begley CG, Ioannidis JPA. 2015. Reproducibility in science: improving the standard for basic and preclinical research. Circulation Res, 116:116-126.

- Macrina FL. 2011. Teaching authorship and publication practices in the biomedical and life sciences. Science and Engineering Ethics, 17:341-354.

- Fanelli D. 2009. How many scientists fabricate and falsify research? A systematic review and meta-analysis of survey data. PLoS One, 5: e5738.

- Papadakis MA, Teherani A, Banach MA, Knettler TR, Rattner SL, Stern DT, Vel JJ, Hodgson CS. 2005. Disciplinary action by medical boards and prior behavior in medical school. N Engl J Med, 353:2673-2682.

Session VI: How to Write a Research Abstract

Wednesday - 21 June 2017
12:00 to 1:00 PM
BI 4081, Surgical Amphitheater, 4th floor of hospital

Readings for Discussion [see attached PDF files]

- Wood GJ, Morrison RS. 2011. Writing abstracts and developing posters for national meetings. J. Palliative Medicine, 14:353-359.

- Graf J. 2008. Handbook of biomedical research writing: the journal article abstract. Hanyang University, Center for Teaching and Learning English Writing Lab.

- See attached PDF of ppt presentation

Please review included previous MSP student abstracts as well as included published abstract texts: abstract text breakdown into five sections as follows:

ABSTRACT (a summary of entire manuscript in 200 words)
- concise background statement - defines the topic under study
- purpose or rational of study – indicates the why for the study
- methodology – indicates the how study was carried out

- results – indicates what was found
- conclusion – interprets the meaning of the findings

MSP Session VII – Constructing and Presenting a Research Poster

Wednesday - 5 July 2017
12:00 to 1:00 PM
BI 4081, Surgical Amphitheater, 4th floor of hospital

Presentation: Patricia L Cameron, PhD, Vice Dean, College of Graduate Studies, Assistant Professor, Department of Medicine.

Topic: The Art of Research Poster Design and Presentation.

- please find enclosed approved poster templates (5) in ppt format - each template is slightly different in style and in color.

- the AU-MCG logo is embedded in the ppt file and should not be altered - column number, box titles, box size, box color, etc are changeable as are font size and font style.

- poster dimensions: 36 inch up-down direction x 42-44 inch left-right direction – cannot print or mount oversized posters.

- complete the template form, save as a ppt, and submit your completed template as an email attachment to rcameron@augusta.edu.

    - MSP printing poster submission deadline: Friday 1 September 2017

    - Annual Medical Scholars Research Day: Monday 25 September 2017, 12:00-3:00 PM, Harrison Education Commons.

- See attached PDF of ppt presentation

MSP Session VIII: Challenging Perspective: Solving Old Problems through New Knowledge

Wednesday – 12 July 2017
12:00 to 1:00 PM
BI 4081, Surgical Amphitheater, 4th floor of hospital

Reading for Discussion [see attached PDF files]

- Dumont NA, Wang YX, von Maltzahn J., Pasut A, Bentzinger CF, Brun, CE, Rudnicki MA. 2015. Dystrophin expression in muscle stem cells regulates their polarity and asymmetric division. Nature Medicine, 21: 1455-1463.

Background Readings

- Sacco A, Mourkioti F, Tran R, Choi J, Llwellyn M, Kraft P, Shkreli M, Delp S, Pomerantz JH, Artandi SE, Blau HM. 2010. Short telomeres and stem cell exhaustion model Duchenne Muscular Dystrophy in mdx/mTR mice. Cell 143:1059-1071.

- Chang NC, Chevalier FP, Rudnicki MA. 2016. Satellite cells in muscular dystrophy – lost in polarity. Trends in Molecular Medicine, 22: 479 – 496.

Reviews for State of Field

- Mauro A. 1961. Satellite cell of skeletal muscle fibers. J Biophys Biochem Cytol., 9: 493-495.

- Almada AE, Wagers AJ. 2016. Molecular circuitry of stem cell fate in skeletal muscle regeneration, ageing and disease. Nature Rev Mol Cell Biol., 17:267279.

- Tierney MT, Sacco A. 2016. Satellite cell heterogeneity in skeletal muscle homostasis. Trends in Cell Biol., 26: 434-444.

Current status of gene editing in dystrophic muscle cells:

- Tabebordbar M, Zhu K, Cheng JKW, Chew WL, Widrick JJ, Yan WX, Maesner C, Wu EY, Xiao R, Ran FA, Cong L, Zhang F, Vandenberghe LH, Church GM, Wagers AJ. In vivo gene editing in dystrophic mouse muscle and muscle stem cells. Science, 351: 407-411.

- Nelson CE, Hakim CH, Oustterout DG, Thakore PI, Moreb EA, Rivera RMC, Madhavan S, Pan X, Ran AF, Yan WX, Asokan A, Zhang F, Duan D, Gersbach CA. 2016. In vivo gene editing inproves muscle function in a mouse model of Duchenne muscular dystrophy. Science, 351:403-407.

- Long C, Amoasii L, Mireault, McAnally JR, Li H, Sanchez-Ortiz E, Bhattacharyya S, Shelton JM, Bassel-Duby R, Olson EN. Postnatal genome editing partially restores dystrophin expression in a mouse model of muscular dystrophy. Science, 351:400-403.

- *UCSF Genomic Medicine Initiative – Genomic & Precision Medicine (Nussbaum R and McCarthy J) – for review of field and associated tools, please see recently

developed comprehensive online lecture series in genomic medicine aimed at health care providers (https://gmi.ucsf.edu/cme-outreach/#coursera)

Previous MSP Readings (2016): stem cell field as relates to regeneration of cardiac muscle

- *Aix E, Gutierres-Gutierrez O, Sanchez-Ferrer C, Aguado T, Flores I. 2016. Postnatal telomere dysfunction induces cardiomyocyte cell-cycle arrest through p21 activation. J Cell Biol., 213:571-583.
- Oh H, Ito H, Sano S. 2016. Challenges to success in heart failure: cardiac cell therapies in patients with heart diseases. J Cardiol., 68:361-367.
- Oh H. 2017. Cell therapy trials in congenital heart disease. Circ Res., 120: 1353-1366.
- Foglia MJ, Poss KD. 2016. Building and re-building the heart by cardiomyocyte proliferation. Development 143:729-740
- Schneider MD. 2016. Meeting Review. Heartbreak hotel: a convergence in cardiac regeneration. Development 143:1435-1441.
- Sahara M M, Santoro F, Chien KR. 2015. Programming and reprogramming a human heart cell. The EMBO J., 34:710-738.

MSP Session IX: Challenging Perspective: New Approaches Applied To Old Problems

Wednesday – 19 July 2017
12:00 to 1:00 PM
BI 4081, Surgical Amphitheater, 4th floor of hospital

Reading for Discussion [see attached PDF files]

- Ataga KI, Kutlar A, Kanter J, Liles D, Cancado R, Friedrisch J, Guthrie TH, Knight-Madden J, Alvarez OA, Gordeuk VR, Gualandro S, Colella MP, Smith WR, Rollins SA, Stocker JW, Rother RP. 2017. Crizanlizumab for the prevention of pain crises in sickle cell disease. N Engl J Med., 376: 429-439.

Background Readings

- Piel FB, Steinberg MH, Rees DC. 2017. Sickle cell disease. N Engl J Med., 376: 1562-1573.
- Ware RE, de Montalembert M, Tshilolo L, Abboud MR. Sickle cell disease. The Lancet, (online ahead of print – 31 January 2017).
- McEver RP. 2015. Selectins: initiators of leucocyte adhesion and signaling at the vascular wall. Cardiovascular Res., 107:331-339.

- Kutlar A, Embury SH. 2014. Cellular adhesion and the endothelium: P-selectin. Hematology/Oncology Clinics of North America, 28: 323-339.

- Hoban MD, Orkin SH, Bauer DE. 2016. Genetic treatment of a molecular disorder: gene therapy approaches to sickle cell disease. Blood, 127:839-848.

- Ribeil JA, Hacein-Bey-Abin S, Payen E, Magnani A, Semeraro M, Magrin E, Caccavelli L, Neven B, Bourget P, El Nemer W, Bartolucci P, Weber L, Puy, Meritet J-F, Grevent D, Beuzard Y, Chrétien S, Lefebvre T, Ross RW, Negre O, Veres G, Sandler L, Soni S, de Montalembert M, Blanche S, Leboulch P, Cavazzana M. 2017. Gene therapy in a patient with sickle cell disease. N Engl J Med., 376:848-855.

- Dever DP, Bak RO, Reinisch A, Camarena J, Washington G, Nicolas CE, Pavel-Dinu M, Saxena N, Wilkens AB, Mantri S, Uchida N, Hendel A, Narla A, Majeti R, Weinberg KI, Porteus MH. 2016. CRISP/Cas9 β-globin gene targeting in human haematopoietic stem cells. Nature, 539:384-389.

- *UCSF Genomic Medicine Initiative – Genomic & Precision Medicine (Nussbaum R and McCarthy J) – for review of field and associated tools, please see recently developed comprehensive online lecture series in genomic medicine aimed at health care providers (https://gmi.ucsf.edu/cme-outreach/#coursera)

Session IX: Challenges to Addressing New Arenas – The Genomic Era and Personalized Medicine

Wednesday – 26 July 2017
12:00 to 1:00 PM
BI 4081, Surgical Amphitheater, 4th floor of hospital

Reading for Discussion [see attached PDF files]

- Li J, Chen X, McClusky R, Ruiz-Sundstrom M, Itoh Y, Umar S, Arnold AP, Eghbali M. 2014. The number of X chromosomes influences protection from cardiac ischaemia/reperfusion injury in mice: one X is better than two. Cardiovascular Res., 102:375-384.

Background Readings

- *UCSF Genomic Medicine Initiative – Genomic & Precision Medicine (Nussbaum R and McCarthy J) – for review of field and associated tools, please see recently developed comprehensive online lecture series in genomic medicine aimed at health care providers (https://gmi.ucsf.edu/cme-outreach/#coursera)