How to Prepare a Competitive Research Proposal

Ginny L. Bumgardner MD PhD FACS
Associate Dean for Research Education

October 12, 2015
Meiling 160

The Ohio State University
Wexner Medical Center
Session Objectives

✓ Learn about the COM Research Scholarship Application
  ✦ Sections
  ✦ Content for each Section
  ✦ Deadlines
  ✦ Review Process

★ Bonus:
  ▪ Similar process applies to many other research sponsor applications
  ▪ Improve your scientific writing skills
  ▪ Some information in this presentation will also be available in the articulate module scheduled for late November.

✓ Learn about new OSU Medical Student Research Program Team Science Pilot Project
Includes the Roessler, Bennett, Barnes and Watts Research Scholarships

- These awards are available to medical students for medical research performed under the guidance of OSU faculty.
- The goal is to engage medical students in biomedical discovery and scholarly inquiry and to encourage students to consider a future academic career in biomedical research.
- Mentors must be full time faculty members at OSU.
- Each mentor can support only 2 medical students who apply to the COM MDSR Scholarship.

http://medicine.osu.edu/go/mdsr
MDSR Website – Resources for Medical Students; Scholarship Opportunities

http://medicine.osu.edu/go/mdsr
Phase I documents due **DECEMBER 14th, 2015**

Phase I documents include:

- ✔ Phase I Cover Page
- ✔ Student’s NIH Biosketch
- ✔ Mentor/Mentee Commitment: Signed student & mentor compacts
- ✔ Research Compliance: IRB/ILACUC Protocols
- ✔ Categorization of Research Project

*All necessary documents available on the MDSR website*
Phased Application Submission - Continued

- Phase II documents due **JANUARY 8th, 2016**
- Documents include:
  - ✔ Phase II Cover Page
  - ✔ Mentor Letter
  - ✔ Abstract
  - ✔ Personal Statement
  - ✔ Training Plan
  - ✔ Research Plan
  - ✔ Environment and Resources
  - ✔ Experimental Duties
  - ✔ Timeline
  - ✔ References
  - ✔ Mentor’s NIH Biosketch

*All necessary documents available on the MDSR website*
Research Trainees

SCHOOL OF HEALTH AND REHABILITATION SCIENCES

Resources for Medical Students > Scholarship Opportunities > MDSR Research Scholarship

College of Medicine MDSR Scholarship

College of Medicine Medical Student Research Scholarship

(Including the Roessler, Bennett, and Barnes Research Scholarships)

These awards are available to medical students for medical research performed under the guidance of the faculty of the College of Medicine. The goal is to engage medical students in biomedical discovery and scholarly inquiry and to encourage students to consider a future academic career in biomedical research. Please note each faculty member may only mentor two medical students through the MDSR program during each given funding period.

Phase I documents are due by 5pm, Monday, December 14, 2015. Phase II documents are due by 5pm, Friday, January 8, 2016.

Phase 1 documents include:

* Download and save all documents prior to making edits, no handwritten items will be accepted.
* **Phase 1 Cover Page**: Phase 1 Cover Page.pdf
* 1 Page Student Biosketch: Applicant Biographical Sketch.docx
* **MENTOR/MENTEE COMPACTS**: Each must be signed by both student and mentor the scanned and uploaded with the application.
  * Medical Student Commitment and Compact.pdf
  * Commitment of Research Mentor.pdf

**IRB and ILACUC Protocol Approval**: If your research involves human subjects or patient data, you will need to provide the Institutional Review Board (IRB) protocol approval/exemption number and provide the amendment documentation that you have been added as key personal. For research involving animals, you will need to provide the Institutional Lab Animal Care and Use Committee (ILACUC) approval/exemption number. Approval by the appropriate regulatory body for these issues is the responsibility of the student's mentor. Additional information is available through the Office of Environmental Health and Safety at [http://ehs.osu.edu](http://ehs.osu.edu) and The Office of Responsible Research Practices [http://orrp.osu.edu/irb/](http://orrp.osu.edu/irb/)

* Phase 1 Instructions.pdf
* Checklist for Medical Student Research IRB or ILACUC approval.pdf
COM Research Scholarship Phase I

- **Cover Page:**
  - Student Information
  - Title of the Proposed Research
  - Faculty Mentor Information
  - Phase I Checklist
  - Approval for 1 year Leave of Absence (LOA) *If applicable*

- **Downloadable & Fully Editable PDF**
  - (Must be legible for reviewers, no handwritten documents)
PHASE I NECESSARY DOCUMENTS CHECKLIST

<table>
<thead>
<tr>
<th></th>
<th>1. MEDICAL STUDENT RESEARCH APPLICATION COVER PAGE</th>
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<tr>
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<td>2. NIH BIOSKETCH OF STUDENT</td>
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<td>6. CATEGORIZATION OF RESEARCH PROPOSAL</td>
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Application Sections
*Biosketch*

Biosketch Sections

- **Educational Training**
  - Institutions, include undergraduate degree and anticipated degrees

- **Positions and Honors**
  - Work experience, research experience, unpaid research internships

- **Academic and Professional Honors and Awards**
  - Honor societies, academic awards, scholarships

- **Publications**
  - Articles, reviews, poster presentations, oral presentations

- **Research Related Coursework and Activities**
  - Undergraduate, medical school etc courses if applicable to project
Application Sections
*Biosketch*

Purpose:

✓ How prepared is the trainee to conduct the proposed research project?

✓ How could the proposed research contribute to the candidate’s career development?

✓ If the trainee has had no research experience, what other experiences could help him/her to conduct this research project?
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IRB AND ILACUC PROTOCOL APPROVAL

- If your research involves human subjects or patient data, you will need to provide:
  - Institutional Review Board (IRB) protocol approval/exemption number
  - The IRB amendment document adding you as key personnel on project

- For research involving animals, you will need to provide:
  - The Institutional Lab Animal Care and Use Committee (ILACUC) approval/exemption number.
  - Approval by the appropriate regulatory body for these issues is the responsibility of the student’s mentor.

All medical students require approval to use IHIS for Clinical Research

- Access to patient data through IHIS, the Integrated Health Information System, requires appropriate clearance to access IHIS for research purposes.

- This process is initiated through the E-service request system and by providing the necessary documentation to the College of Medicine Research Compliance office.

- http://medicine.osu.edu/research/clinical_research/research%20and%20hipaa/pages/obtain-access-for-research.aspx

★ IHIS use is audited

*Resources available on the MDSR website
The Office of Responsible Research Practices (ORRP) provides administrative support to the university research community and the review boards responsible for research oversight. The ORRP staff helps OSU faculty, staff, and student researchers navigate regulations governing research in a way that fosters ethical conduct, ensures compliance, and minimizes administrative burden.

- The Institutional Animal Care and Use Committee (IACUC) oversees the responsible use of animals in university research and instructional activities.
- The Institutional Biosafety Committee (IBC) reviews projects involving recombinant DNA and biohazards.
- The Institutional Review Board (IRB) reviews human subjects research proposals to ensure adequate protections are in place before humans participate in research.
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What is the Medical Student Mentor/Mentee Compact?

I acknowledge that I have the primary responsibility for the successful completion of my research project. While engaged in research I will maintain a high level of professionalism, self-motivation, engagement, scientific curiosity, and ethical standards. **Professionalism**

- I will meet regularly with my research advisor and provide him/her with updates on the progress and results of my activities and experiments. I will strive to meet established deadlines. I will be responsive to advice and constructive criticism. **Communication**

- I will attend and actively participate as a team member in laboratory meetings, seminars and journal clubs while a member of the research laboratory. **Expectations**

- I will comply with all institutional policies. **Professionalism**

- I will be a good lab citizen. I will agree to take part in shared laboratory responsibilities and will use laboratory resources carefully and frugally. I will maintain a safe and clean laboratory space. I will be respectful of, tolerant of, and work collegially with all laboratory personnel. **Professionalism & Safety**

- I will maintain a detailed, organized, and accurate laboratory notebook. **Professionalism & Expectations**

- I will discuss policies on work hours, sick leave and vacation with my research advisor. I will consult with my advisor and notify fellow lab members in advance of any planned absences. **Expectations & Communication**

- I will discuss policies on authorship and attendance at professional meetings with my research mentor. I will work with my mentor to submit all relevant research results that are ready for publication in a timely manner. I will prepare an abstract and poster of my research for the College of Medicine MDSR Research Symposium. **Professionalism & Science Communication**
What is the Medical Student Mentor/Mentee Compact?

I will be committed to the research project of the medical student. I will help to plan and direct the student’s project, set reasonable and attainable goals, and establish a timeline for completion of the project. Research mentorship

I will be committed to meeting one-on-one with the student on a regular basis. I will provide for every student under my supervision an environment that is intellectually stimulating, emotionally supportive, safe, and free of harassment. Research mentorship

I will be committed to providing laboratory resources for the student as appropriate or according to my institution’s guidelines, in order for him/her to conduct research. Research mentorship

I will expect the student to share common laboratory responsibilities, utilize resources carefully, frugally. Expectations

I will not require the student to perform tasks that are unrelated to his/her training program and professional development. Expectations

I expect the medical student research trainee to exhibit professional behavior and conduct research in keeping with the principles and guidelines of professionalism as described in the OSU College of Medicine's Policy on Professional Behavior. Professionalism

Throughout the student’s time in my laboratory, I will be supportive, equitable, accessible, encouraging, and respectful. I will foster the student’s professional confidence and encourage critical thinking, and creativity. Research mentorship
Origins of the OSU COM Medical Student Research Mentor/Mentee Compact

- AAMC Compact Between Postdoctoral Appointees and Their Mentors
  - https://www.aamc.org/initiatives/postdoccompact

- AAMC Compact Between Biomedical Graduate Students and Their Research Advisors
  - https://www.aamc.org/initiatives/gradcompact
## PHASE I NECESSARY DOCUMENTS CHECKLIST

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2. NIH BIOSKETCH OF STUDENT
3. IRB/ILACUC PROTOCOL APPROVALS
4. SIGNED STUDENT COMPACT
5. SIGNED MENTOR COMPACT
6. CATEGORIZATION OF RESEARCH PROPOSAL
IRB/ILACUC Checklist & Categorization of Research

Medical Student Research Scholarship Application
Checklist Guideline for IRB/ILACUC approval

If your research involves human subjects or patient data, you will need to provide the Institutional Review Board (IRB) protocol approval/exemption number. For research involving animals, you will need to provide the Institutional Lab Animal Care and Use Committee (ILACUC) approval/exemption number. Approval by the appropriate regulatory body for these issues is the responsibility of the student’s mentor. Additional information is available through the Office of Environmental Health and Safety at [http://ehs.osu.edu/](http://ehs.osu.edu/) and The Office of Responsible Research Practices [http://orrp.osu.edu/](http://orrp.osu.edu/).

Exempt Info: [http://orrp.osu.edu/irb/exempt/index.cfm](http://orrp.osu.edu/irb/exempt/index.cfm)
IRB Info: [http://orrp.osu.edu/irb/forms/](http://orrp.osu.edu/irb/forms/)

Project IRB or ILACUC requirements, this question is required for your application.
Check all that apply
- IRB Approved (my project already has IRB approval)
- ILACUC Approved (my project already has ILACUC approval)
- My project is IRB exempt (my project already has IRB exemption)
- My project is ILACUC exempt (my project already has ILACUC exemption)
- Applied/Applying for IRB or ILACUC approval/exemption
- Other
Please explain if other

*If your project does not have IRB/ILACUC approval or exemption, you will need to any relevant compliance, bio-safety requirements, or other training you will have to obtain to work in your mentor’s lab. Please be sure your mentor also includes these details in the mentor’s letter you submit with Phase 2.

IRB/ILACUC approval or exemption number

Lastly you will need to provide the IRB/ILACUC document, if your mentor has IRB/ILACUC approval or exemption.

<table>
<thead>
<tr>
<th>Category of Proposed Research</th>
<th>Basic</th>
<th>Clinical</th>
<th>Translational</th>
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<tbody>
<tr>
<td>Cancer Biology &amp; Clinical Cancer Research</td>
<td>Basic and Applied Research in Inflammation, Infectious &amp; Immunology</td>
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<td>Cancer Biology</td>
<td>Microbial Pathogenesis</td>
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<td>Cancer Genetics</td>
<td>Immunology</td>
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<td>Cancer Therapy</td>
<td>Critical Care</td>
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<td>Other</td>
<td>Autoimmunity</td>
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<tr>
<td>Molecular Biology, Genetics, &amp; Therapeutics</td>
<td>Transplantation</td>
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<td>Molecular Pharmacology, Pharmacogenomics and Pharmacotherapeutics</td>
<td>Infectious Disease</td>
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<td>Molecular Genetics</td>
<td>Wound Healing</td>
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<td>Molecular Virology and Gene Therapy</td>
<td>Tissue Repair and Regeneration</td>
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<td>RNA biology</td>
<td>Other</td>
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<td>Other</td>
<td>Neuroscience, Psychological, &amp; Musculoskeletal</td>
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<td>Biomedical Informatics/Health Care Ed., Delivery, Organization/Research Ethics</td>
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<td>Biomedical Informatics</td>
<td>Neurology</td>
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<td>Radiology and Imaging Research</td>
<td>Neurologic Disorders</td>
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<td>Applied Medical Informatics</td>
<td>Musculoskeletal Disorders</td>
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<td>Patient Research Ethics</td>
<td>Psychological Disorders</td>
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<td>Health System Administration/Management</td>
<td>Other</td>
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<td>Cell Biology and Organ Specific Disorders</td>
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<td>Medical Education</td>
<td>Cell, Organ Systems &amp; Integrative Biology</td>
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<td>Public Health Research</td>
<td>Heart Disease</td>
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<td>Other</td>
<td>Eye Disease</td>
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<td>Research in Special Populations</td>
<td>Endocrine Disorders</td>
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<td>Aging</td>
<td>Kidney Disease</td>
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<td>Anesthesia/Surgery</td>
<td>Liver Disease</td>
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<td>Pediatrics/Adolescence</td>
<td>Lung Disease</td>
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<td>Research to improve Women’s Health</td>
<td>Pancreatic Disorders</td>
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<td>Nutrition/Obesity</td>
<td>Vascular Disease</td>
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<td>Other</td>
<td>Skin Disease</td>
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<tr>
<td>Community Research</td>
<td>Other Organ Specific Disorders</td>
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<td>Emergency Medicine</td>
<td>If your research does not fit exactly into any of these categories, please choose the category it matches most closely.</td>
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<td>Recovery &amp; Rehabilitation</td>
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<td>Trauma</td>
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<td>Other</td>
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COM Research Scholarship Phase II

- Phase II documents due **JANUARY 8th, 2016**
- Documents include:
  - Phase II Cover Page
  - Mentor Letter
  - Abstract
  - Personal Statement
  - Training Plan
  - Research Plan
  - Environment and Resources
  - Experimental Duties
  - Timeline
  - References
  - Mentor’s NIH Biosketch
### Phase II Cover Page

#### PHASE II CHECKLIST

1. COVER PAGE (include Student, mentor name)
2. MENTOR LETTER
3. ABSTRACT (150 words)
4. TRAINEE PERSONAL STATEMENT (150 words)
5. Training Plan (200 words)
6. RESEARCH PLAN (3 pages)
   a. SPECIFIC AIMS
   b. BACKGROUND INFORMATION
   c. PRELIMINARY STUDIES
   d. EXPERIMENTAL DESIGN & METHODS
7. ENVIRONMENT & RESOURCES (150 words)
8. EXPERIMENTAL DUTIES ON PROJECT (150 words)
9. TIMETABLE (specific dates, weeks of duties)
10. REFERENCES (1 page)
11. NIH BIOSKETCH OF MENTOR

*Downloadable & Fully Editable PDF*
Application Sections

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Mentor Letter & Abstract

- **Mentor Letter** = A *letter of recommendation* in which the mentor assesses your qualities, characteristics, and capabilities and recommends that you have the ability or capacity, time and environment to learn how to perform the particular tasks or functions associated with your research project.
  - Mentor letters can be submitted by mentor directly to research.education@osumc.edu
  - Or student may submit during Phase II submission

- **Abstract** = a brief summary of your research hypothesis/purpose, significance and plan
  - 150 Words
**Application Sections**

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Application Sections
*The Personal Statement*

- A unique and personal introduction of yourself to the application reviewer.
  - Past Research Experience & Outcomes
  - Interest in Specific Medical Problems/Issues
  - Research Training Needs/Interests
  - Career Goals

- Questions to ask yourself when writing your personal statement.
  - What is distinctive about me?
  - What events, people or family history have shaped my interest in medical research and/or medical problems/issues?
  - When did I first become interested in the field of research?
  - What do I hope to gain from this research training experience?
Presently, standard operative procedures lack the technological capabilities to ensure that a target cancer has been excised in its entirety. Advancements are needed in the field of \textit{xxx} to enhance diagnostic technologies. I believe that working in Dr. “X” group will give me a unique opportunity to interact in a research environment with both clinicians and graduate researchers. Additionally, it will give me the opportunity to further learn research presentation skills that I began to develop during my previous research experience. Finally, I believe this project could evolve into a long-term and highly productive endeavor which will allow me to follow this project into the future.
Application Sections
*The Personal Statement*

Examples:

This is a subject that I am exceptionally passionate about due to my personal experiences. Trace amounts of cancer sometimes remain in the patient following resection, undetectable by current techniques, and may lead to future relapse. My “family member” had undergone a xxxx surgical procedure following the diagnosis of xxxx. Despite following standard care, involving frequent scans and biopsies, he/she experienced full relapse which had developed into Stage IV Cancer by the time it was detected. He/She passed away .... I believe that if detection techniques were better, as proposed by the goal of this research project, the cancer that remained following xxxx may have been found an removed, ....
Training Plan

- How will you prepare for your role on the project?
  - What type of training will be provided
  - How will this build on knowledge you already have
  - Who will provide the training and when

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<tr>
<td>11. NIH BIOSKETCH OF MENTOR</td>
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## Application Sections

<table>
<thead>
<tr>
<th>Phase II Checklist</th>
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<tbody>
<tr>
<td>1. COVER PAGE (include Student, mentor name)</td>
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<tr>
<td>2. MENTOR LETTER</td>
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<tr>
<td>3. ABSTRACT (150 words)</td>
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<tr>
<td>4. TRAINEE PERSONAL STATEMENT (150 words)</td>
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<tr>
<td>5. Training Plan (200 words)</td>
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<tr>
<td>6. RESEARCH PLAN (3 pages)</td>
</tr>
<tr>
<td>a. SPECIFIC AIMS</td>
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<tr>
<td>b. BACKGROUND INFORMATION</td>
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<tr>
<td>c. PRELIMINARY STUDIES</td>
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<tr>
<td>d. EXPERIMENTAL DESIGN &amp; METHODS</td>
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<tr>
<td>7. ENVIRONMENT &amp; RESOURCES (150 words)</td>
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<td>8. EXPERIMENTAL DUTIES ON PROJECT (150 words)</td>
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<tr>
<td>9. TIMETABLE (specific dates, weeks of duties)</td>
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Application Sections

*The Research Plan*

a. Specific Aims
b. Background & Significance
c. Preliminary Studies
d. Experimental Design & Methods
e. References
✓ What are the **main goals** of your project?
  • Test the comparative efficacy of a new assay or method for .....enhancement of diagnosis, prognosis
  • Study a specific biochemical pathway important in pathophysiology of a disease process .....such as acute pancreatitis
  • To assess the comparative efficacy of a drug to treat hypertension...
  • To determine the efficacy of a new technology for diagnosis of myocardial ischemia...
  • To design and compare 2 educational strategies to improve patient compliance with medications

✓ What **specific question(s)** will be answered?
✓ How will your project **approach** the problem?
✓ **State your hypothesis**
Research Plan
Background & Significance

✓ What is the main problem that this project will address?
✓ What work has been done by others in the field?
✓ What gaps are there in solving this problem?
✓ What more needs to be known about the problem?
✓ What is the significance of the problem that you propose to study to human health?
Research Plan
Preliminary Studies

- Describe any previous work in your mentor’s laboratory or from the published literature that supports the rationale for this project

- Use Figures, diagrams, photos, histology etc as needed
Use of Figures, Diagrams, Tables, Photos
don’t forget the figure legends

- Preliminary Data
  
  ![Graph showing data](image1)

- Histology

- Equipment

- Paradigm/Mechanism

- Clinical Protocol

- Western Blot
  
  ![Western Blot Image](image2)
Use of Figures, Diagrams, Photos

- Preliminary Data
- Histology
- Equipment
- Clinical Protocol

- Paradigm
- Mechanism

Figure 1 – Estimated timeline of testing procedure including expected time of each stage [21].
Experimental Design & Methods:
- Describe the plan of experiments and controls
- Number of subjects or animals
- Describe the methods to be used
- Discuss what data/results will be collected
- Discuss how the data will be analyzed
- Discuss the plan for statistical analysis of results
- Address feasibility of what you propose to do
- Identify any novel approaches or methods you will use

A. REFERENCES: Key publications substantiating the significance of the problem, rationale for the project, approach, feasibility,…
Application Sections

*Environment/Resources and Experimental Duties*

- Environment and Resources
  - Lab Space
  - Access to database
  - Equipment
  - Experts in the field
  - Statistical Analysis
  - Personnel in the lab

- Experimental Duties
  - What will you personally do?
  - Who else, if anyone, will assist you and what role?
Application Sections

*Timeline*

**Timeline**

- How much time will you devote to the project?
- When do you anticipate completing each milestone, goal or aim?
- Week 1… Week 2… Week 3…, etc
- Table of expected accomplishments
- **Be specific**
- Include time for analysis and reporting
Scientific Writing

Should be easy to read, understand, and should present your ideas in an exciting, yet specific manner.

The abstract of your proposal is the single most important paragraph of your proposal. If the grant reviewer has a good idea of the direction of your proposal from reading the abstract, it creates an important first impression that you do indeed know what you want to accomplish, with whom, and with what specific approaches.

In reading an exciting, well-written proposal, one idea follows naturally to the next.
Common Reviewer Criticisms
and where the applicant could have included this information…

- “there is mention of 2 interventions but the nature of this intervention is not provided…”
  
  *Aim, Research Plan,*

- It is unclear how the data will be analyzed
  
  *Research Plan, Methods*

- No indication of the number of subjects to be recruited
  
  *Research Plan, Methods*

- Interesting idea but difficult to appreciate a hypothesis or details of the applicant’s plan
  
  *Hypothesis*
Reviewer Comments Continued
and where the applicant included this info…

- This proposal is very clear and well written. **Clarity**

- The student is already engaged in the project and participating in lab meetings. **Candidate**

- The project has very clear goals that can be achieved in the time frame specified. **Aims**

- It capitalizes on the strengths of the student in IT yet allows him to apply his knowledge to a novel problem of medical relevance and learn new skills in the process. **Training Plan**

- The student is an excellent candidate who brings tremendous skills to this project. **Candidate**
Reviewer Comments Continued
and where the applicant could have included this info…

- The proposal is poorly written, repeated in some parts and suffers from lack of continuity (font, font size, grammatical errors throughout, lack of attention to details for presentation, lack of clarity) Clarity

- Does not identify the model in sufficient detail Methods

- It is not clear what is being compared Research Plan

- Where are the controls for the experiment? Methods

- …it is a bit unclear how Aim 1 will advance knowledge of the field (impact) Significance
Reviewer Comments Continued

- Academic record was not provided. *Biosketch*

- Previous research experience is a strength. *Biosketch*

- It would have been helpful if the candidate has described past research experience in a little more detail. *Biosketch*
Reviewer Comments Continued
and where the applicant included/could have included this info…

- Training value of proposed experience is outstanding as a) concept is new, b) will compare other methods, c) uses novel methodologies… Training Plan

- Good project and simple goals Aims

- The student proposes to perform a literature survey and write a review paper regarding……He proposes specific questions to address which are really the key issues surrounding treatment of this condition. There is no specific hypothesis to be tested or need for research materials. Not hypothesis based research

- From this project, the student hopes to gain experience in reading and analyzing the literature on a specific topic. Although this is an important skill that all physicians should seek to develop, it would not seem to fall under the rubric of a “research skill Not hypothesis based research
Reviewer Comments

- While the project is interesting some of the goals are over ambitious for a student to complete over the limited time period **Feasibility**

- This is too much to handle in 10 weeks for the applicant. Too many variables and too many cell systems to handle…**Feasibility**

- The proposal is diffuse and needs focus. **Focus**

- Xxxx has the academic qualifications (her biosketch details her very strong academic record) and prior research experience (she was a research assistant in a nerve regeneration study and already is first author or co-author on 3 peer-reviewed publications with a fourth in review) to prepare her for the present research project. **Candidate**
Reviewer Comments Continued

and where this information could have been included…

- No case report form is provided, so I am left with an unclear picture as to the actual structure of the survey. Survey research can be highly biased by the structure of the instrument itself so including the survey tool would have been quite helpful. *Methods or Appendix*

- To say that “a series of questions” will be asked of study participants is very vague. It would be helpful to have a copy of the questionnaire. *Research Plan*

- How are you planning to validate your survey instrument to make sure it is giving you reproducible results? *Statistical Methods, References*

- What are family- and patient-specific variables that may influence the answers they are giving you? *Background & Significance, Research Design, Methods…*

- How do you plan to control for or analyze these variables? *Methods*

- What kind of sample size will you need to successfully carry out your study? How did you arrive at that number? *Methods*
COM Scholarship Requirements
(failure to meet requirements risks forfeiture of the scholarship funds)

✓ All Research Regulatory Compliance Documentation submitted prior to disbursement of scholarship funds—this is for your protection!

✓ Attend the 2016 Kickoff event prior to the summer research (May/June 2016)

✓ Electronic survey at 2-3 weeks to check in with Mentor & Mentee

✓ Final Mentor and Mentee evaluation

✓ Must present poster at annual Medical Student Research Symposium in October 2016

✓ Final Report due approximately ten (10) business days after the last day of the project

*MDSR does not fund travel to conferences or poster printing*
How do I submit my application…

1. MDSR Website
2. Resources for Medical Students
3. MDSR Research Scholarship
4. Download all necessary application components
5. Submit Phase I by December 14th, 2015
Submission Process - MDSR website

Save and Continue will work as long as you return to the survey on the same Internet browser and computer you started the survey on. *By default, respondents have **one week** to return to the survey and finish their response. After a week, your response will be recorded as-is.
External Funding Sources
Summer
2015 Carolyn L. Kuckein
AOA Medical Student Research Fellowship

• Research support for a continual period of a minimum of 8-10 weeks, 30 hrs/week, or an average of 4 hrs/wk for 12 months over 1-2 years.

• Supports clinical investigation, basic laboratory research, epidemiology, social science/health services research, leadership or professionalism.

• Students DO NOT have to be AOA members in order to apply. All 1st, 2nd, and 3rd year medical students are eligible to apply. (PhD or MD/PhD candidates are NOT eligible)

• Award is $5000, one half paid on announcement of award, one half on approval of final report. Up to an additional $1000 reimbursed for travel to present on research at a national meeting.
2015 Carolyn L. Kuckein Student Research Fellowship

• OSU students submit their application to the OSU chapter of AOA, and then the committee selects ONE application to send to the national office for consideration. 50 Fellowships are granted nationwide.

• Applications are due to OSU chapter by December 31, 2015 and must include a 3 page summary of the proposed research project, the applicants CV, a letter of support from the faculty supervisor, the mentor's biographical sketch, and the completed application form with checklists.

Date of award announcement: on or about April 15, 2016
More information, contact aoa@osumc.edu, all application information may be found at www.alphaomegaaa.org/student_research.html
2015 HHMI Summer Medical Fellows Program Overview

The HHMI Summer Medical Fellows Program provides an 8–10 week research experience for medical, dental, and veterinary students in the laboratories of HHMI investigators, early career scientists, HHMI professors or Janelia researchers. This fellowship program is primarily aimed at those students who wish to use the summer research experience to explore continuing research through a year-long research training program. Subsequent applications to the year-long Medical Research Fellows Program are not limited to the laboratory in which the summer experience was obtained. Students from all medical, dental and veterinary schools in the U.S. are encouraged to apply for this beneficial educational opportunity. Up to 20 fellowships will be awarded in 2015.
APPLY ONLINE
www.hhmi.org/medfellowships

✧ HHMI Investigators listed on website
✧ $5,000 (10 weeks)
✧ $1,000 (for relocation)
OSU Medical Students Experiences

- **HHMI Summer Medical Fellows Program**
  - Russell Bonneville, M3
  - Mentor: Richard P. Lifton, MD, PhD
  - Institution: Yale University
  - Current Research: *Identifying Common Disease Pathways via Human Genetics*
  - Dr. Lifton uses genetic approaches to identify the genes and pathways that contribute to common human diseases, including cardiovascular, renal, and bone disease.
Richard P. Lifton MD

(one of 6 awardees for the 2014 Breakthrough Prize in Life Sciences for his discovery of genes and biochemical mechanisms that cause hypertension)

Acceptance Remarks: We do biomedical science driven by curiosity, the thrill of discovering fundamental mechanisms about how life works, and the confidence that detailed understanding of normal and disease biology provides a key to improve human health. I’m honored and exhilarated to receive this prize, in particular to be selected by such a remarkable group of scientists. Hypertension (high blood pressure) affects one billion people, and is a principal risk factor for cardiovascular disease, the leading cause of death worldwide. To discover the fundamental mechanisms that govern blood pressure, we identified patients around the world with exceptionally high or low blood pressure due to single gene mutations, and identified the mutated genes. Remarkably, these genes all encode mediators and regulators of salt reabsorption by the kidney. Mutations that increase or decrease salt reabsorption drive blood pressure to its highest or lowest levels, respectively. These findings establish the fundamental role of salt balance in blood pressure homeostasis, and provide the scientific foundations for public health efforts to limit dietary salt intake, for rational combinations of antihypertensive medications, and for development of new therapies….
2015 HHMI Summer Medical Fellows

Deadlines

Program Dates
Online application opens - August 24, 2015

Application Deadline - **January 11, 2016, 2 p.m. ET**

Award Notification - March 18, 2016

Acceptance Deadline - March 25, 2016

Fellowship begins between May 1 and September 1

Summer Program Information

Summer Program Highlights

Summer Program Mentors
NIH Summer Internships Overview

The NIH Clinical Center (CC) Summer Internship Program offers summer internships to students who are U.S. citizens or permanent residents and are currently enrolled in high school, college, graduate programs, and health professional schools including nursing and medicine.

Each year, more than 7,000 students apply to the National Institutes of Health Summer Internship Program. From this pool, approximately 50 students are selected to participate in the Clinical Center's internship experience. At the Clinical Center—the nation's largest hospital devoted entirely to clinical research—students work with mentors who are researchers and health professionals; participate in the NIH Research Poster Day with results generated by their work in this summer program; and attend weekly lectures presented by NIH investigators.
NIH Summer Internships Purpose

- The NIH Clinical Center Summer Internship Program (SIP) is designed to provide currently-enrolled students an opportunity to spend a summer working side-by-side with some of the most talented researchers, administrative staff, and health professionals in an environment devoted exclusively to clinical research.
OSU Medical Student Experiences

- NIH MRSP (Medical Research Scholars Program) for 2015-2016
- Janini Singaravelu, M3
- Ophthalmology research at the National Eye Institute

The National Institutes of Health (NIH) Medical Research Scholars Program (MRSP) is a comprehensive, year-long research enrichment program designed to attract the most creative, research-oriented medical, dental, and veterinary students to the intramural campus of the NIH in Bethesda, MD.
Research Training  Research training will take place at the NIH. Residents can work either within the Surgical Neurology Branch, or can call upon the significant resources of the NIH intramural research program, to identify a research project. Specific emphasis will be placed on preclinical research as well as the design of a prospective clinical research protocol, to be completed during the training period. The curriculum is designed for trainees to become future clinician-scientists and leaders in this dynamic field.

OSU Faculty Resource:  Russell Lonser MD, Chair of Neurosurgery

OSU Medical Student Resource:  Christopher Hong
NIH Summer Internships Deadlines

- **2016 Summer Internship Experience**  
The start date for the 2016 program is June 13, 2016. The summer internship is 40 hours a week for 8 weeks. Selected students must participate in the program for eight, uninterrupted weeks, leaving no earlier than August 5, 2016.

- **Apply to the NIH Summer Internship Program: November-March 1**  
Applications are accepted from late-November through March 1 each year. Apply on-line using the NIH-wide application and specify your interest in the 'Clinical Center.' Students will receive notice of application acceptance by early April.

- For more information, please email the CC Summer Internship Program staff.

http://www.cc.nih.gov/training/students/summer_internships.html
**Purpose:** The (MDSRP) is launching a PILOT program which will enhance medical students’ research exposure, competency, and career opportunities.

**Program Objectives:**

- Enhance medical student awareness of and participation in medical research spanning basic/translational, clinical and population health through team science
- Facilitate medical student engagement in research utilizing genomics, informatics and EMR
- Promote medical student participation in longitudinal research (summer full time, part-time M2, research year leave of absence and/or AC in Research in M4) and enhance medical student publication productivity
- Enhance competitiveness of OSU medical students for HHMI and other extramural year long research fellowships
OSU Medical Student Research Program
Team Science Pilot Project

- **Description:**
  - a team of three students with a team of three PIs over the summer on a thematically related area of research.
  - Each student will have a separate project which may be laboratory-based (translational), clinical research, community-based population health or hypothesis-generating research.
  - Students will work with their individual mentors but also will interact with all of the team members during the summer to learn about the purpose, approaches and progress on all 3 projects.
OSU Medical Student Research Program
Team Science Pilot Project

- **Eligibility:** This opportunity is for first year medical students, interested in performing research full-time during the summer and considering longitudinal research experiences....
  - such as continuation of research on a part-time basis during the second year of medical school
  - pursuing a year-long research leave of absence between Med 2 and Med 3 or between Med 3 and Med 4 years
  - and/or pursuing an LSI Advanced Competency in Research.
Benefits:

- Exposure to multiple thematically related research projects and team science
- Faculty mentorship and networking
- Foundation for a 4th year Advanced Competency in Research
- Potential clinical experiences which highlight translational research applications
- Potential co-authorship on research publications
- Engagement in interprofessional collaborations
- Introduction to physician-scientist career opportunities
- Summer stipend ($3,000), research expenses ($1,000) and approved travel ($1,000)

For more info, contact research.education@osumc.edu
Questions ????

MDSR Program Office Contact Information:
Research.Education@osumc.edu
1190A Graves Hall
333 W 10th Ave
Columbus, OH 43210
http://medicine.osu.edu/go/mdsr