Introductions

- Ginny L. Bumgardner, MD, PhD
  - Associate Dean of Research Education
  - Medical Student Research
  - Residents & Fellows Research
    - Masters of Science in Medical Science Program
  - Clinical and Translational Research Training for Graduate Students
    - Co-Director, OSU HHMI Med-into-Grad Scholars Program
  - COM Trainee Research Day

- Bianca McArrell
  - Program Manager, Medical Student Research
Biomedical Research and Medicine
What is Research Education?

Research Education is training that incorporates activities involved in the process of

- Discovery through Critical Thinking, Innovation & Experimentation
- Communication of New Knowledge
- Application of New Knowledge to enhance Patient Care
- Evaluation of Outcomes in Humans
Medical Student Research Program (MDSR)

- Goal: The Office of Research Education's Medical Student Research Program aims to promote awareness of research opportunities and facilitate research success for OSU medical students.

- MDSR Program of Activities
  - Evidence Based Inquiry & Research (EBIR) in LSI
  - COM Medical Student Research Scholarships
  - Landacre Honor Society
Medical Student Research Program (MDSR)

MDSR Annual Program of Activities:

- Serves as a resource for information
- Provides tips on how to find a faculty research advisor and current research opportunities.
- Facilitates application to internal and extramural funding opportunities for eligible Medical Student Research projects.
- Publicizes news, research accomplishments, presentations, and publications by OSU medical students in the MDSR Newsletter.
Evidence Based Inquiry & Research in LSI (EBIR): Problem Solving

Health-----Disease-----Intervention-----Outcome & Assessment

In the new LSI......

• **Inquiry:** Ask Important Health Related Questions
• **Research Design:** Develop an Action Plan to Answer the Question
• **Research:** Action
• **Analyze:** Evaluate the Results of the Action Plan (Critical Thinking)
• **Communicate:** the Conclusions
What Kinds of People Do Research?
Medical Student Research Experience

Value

- First Hand Experience in Biomedical Discovery
- Depth of Knowledge in a Particular Field
- Develop Research Skills
- Influence on Your Career Opportunities
- Advance the Future of Medicine
- Influence Institutional Reputation
A Major Discovery
A Major Discovery—Insulin

- **1869**: Paul Langerhans, medical student in Germany studying the histology of the pancreas, noted 2 types of cells (acinar and islet cells)

- **1889**: Josef von Mering, a researcher focusing on GI tract approached a colleague with training in surgery, Oskar Minkowski---pancreatectomy created disorder similar to human diabetes

- **1890-1920s**: Many near discoveries...

- **1921**: Toronto-trained surgeon Frederick Banting MB came up with an idea after reading an article about how to optimize isolation of islets the purported source of “internal secretion” (hormone). He approached JJR MacLeod PhD, Chair of Dept Physiology at the University of Toronto and expert in carbohydrate metabolism. MacLeod was skeptical due to Banting’s lack of research experience and failures by many others but he was convinced enough to rework his ideas and experiments. He also introduced Banting to James Collip PhD (a physiologist/biochemist, full professor from Univ of Alberta doing a sabbatical with Dr. MacLeod) and medical student Charles Best (Univ of Toronto, Maine). Together this quartet discovered the hormone insulin in pancreatic extract of dogs. They injected the hormone into a diabetic dog and found that blood glucose was normalized. Published in The next year they purified insulin successfully treated a boy with diabetes

- **1923**: Banting & Macleod shared the 1923 Nobel Prize for Physiology & Medicine

^
A Major Discovery - The Team

The Journal of Laboratory and Clinical Medicine
Vol. VII St. Louis, February, 1922 No. 3

ORIGINAL ARTICLES
THE INTERNAL SECRETION OF THE PANCREAS

By F. G. Banting, M.B., and C. H. Best, B.A.

The hypothesis underlying this series of experiments was first formulated by one of us in November, 1920, while reading an article dealing with the relation of the isles of Langerhans to diabetes. From the passage in this article, which gives a résumé of degenerative changes in the acini of the pancreas following ligation of the ducts, the idea presented itself that since the acinous, but not the islet tissue, degenerates after this operation, advantage might be taken of this fact to prepare an active extract of islet tissue. The subsidiary hypothesis was that trypsinogen or its derivatives was antagonistic to the internal secretion of the gland. The failures of other investigators in this much-worked field were thus accounted for.

The feasibility of the hypothesis having been recognized by Professor J. J. R. Macleod, work was begun, under his direction, in May, 1921, in the Physiological Laboratory of the University of Toronto.

Frederick Grant Banting (1891-1941)
John James Rickard Macleod (1876-1935)
Charles Herbert Best (1899-1978)
James Bertram Collip (1892-1965)
A Major Discovery-Insulin and Beyond

- **1923**: Banting & Macleod receive the 1923 Nobel Prize for Physiology & Medicine
- **1966**: First Pancreas Transplant, Richard Lillehei MD, University Of Minnesota (3 years after the first kidney transplant)

... 

**This Story began with Inquiry:** What causes diabetes?
MDSR COM Scholarship Applications & Awards

![Bar chart showing applications and awards from 2004 to 2013.](chart.png)
Medical Student Research Program

- Research Opportunities
- Scholarship Opportunities
- Research Projects/Mentors
- Events
- Resources

http://medicine.osu.edu/go/mdsr
Potential Timing of Research Experiences

- **Med VI**  - Advanced Competencies in Research
  - Leave of Absence for year long research experience (LOA)

- **Med III**  - Current N = 2
  - Leave of Absence for year long research experience or Year Long part time research project (LOA)

- **Med II**  - Current N = 3
  - Summer Research Project 10 weeks

- **Med I**  - Current N = 79
Annual OSUWMC Trainee Research Day
April 2013* – Med = 34%

- Graduate Students: 139
- MD/PhD Students: 84
- Medical Students: 37
- Postdoctoral Researcher/Fellows: 58
- Residents/Clinical Postdoctoral Fellows: 133
- Undergraduate: 14
- Postbaccalaureate Scholar: 16
<table>
<thead>
<tr>
<th>Trainee Name</th>
<th>Project Title</th>
<th>Mentor Name</th>
<th>Research Category</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audrey Lloyd</td>
<td>Identification of the Region of Pneumococcal Protein BgaA that Mediates Adherence to Human Epithelial Cells</td>
<td>Samantha King</td>
<td>Basic</td>
<td>Pediatrics</td>
</tr>
<tr>
<td>Andrew Stiff</td>
<td>miRNA in Serum and Bone Marrow Plasma Cells From Multiple Myeloma Patients</td>
<td>Flavia Pichiorri</td>
<td>Basic/Translational</td>
<td>Internal Medicine</td>
</tr>
<tr>
<td>Amy Somerset</td>
<td>The Impact of Pre-Diabetes on Glycemic Control and Clinical Outcomes Post-Burn Injury</td>
<td>Larry Jones</td>
<td>Clinical</td>
<td>Critical Care Trauma and Burn</td>
</tr>
<tr>
<td>Sarada Eleswarpu</td>
<td>Assessment of Pediatric Resident Handover Skills</td>
<td>Rajesh Donthi</td>
<td>Education</td>
<td>Hospital Pediatrics</td>
</tr>
<tr>
<td>Yao-Wen Cheng</td>
<td>Injuries associated with baby gates and barriers among children 6 years treated in US emergency departments; 1990-2010</td>
<td>Lara McKenzie</td>
<td>Clinical</td>
<td>Pediatrics</td>
</tr>
<tr>
<td>James Vargo</td>
<td>Intra-operative Biliary Mapping During Laparoscopic Cholecystectomy Using Indocyanine Green and Near Infrared Fluorescence Cholangiography</td>
<td>Scott Melvin</td>
<td>Clinical</td>
<td>Surgery</td>
</tr>
<tr>
<td>Ana De Roo</td>
<td>Television-Related Injuries to Children in the United States; 1990-2011</td>
<td>Gary Smith</td>
<td>Clinical</td>
<td>Nationwide Children's Hospital</td>
</tr>
<tr>
<td>Tim Richmond</td>
<td>Recombinant anti-nucleolin antibodies as a novel approach for cancer early-diagnosis and therapy</td>
<td>Carlo Croce</td>
<td>Basic</td>
<td>MVIMG</td>
</tr>
<tr>
<td>Nicholas Polley</td>
<td>A Quality Initiative to Optimize Blood Glucose Control to Reduce Risk of Peripheral Vascular Bypass Graft Surgical Site Infections</td>
<td>Julie Mangino</td>
<td>Clinical</td>
<td>Infectious Diseases</td>
</tr>
<tr>
<td>Kavya Manu</td>
<td>DC3: Diabetes Control; Compliance; and Continuity Hospital Discharge Program</td>
<td>Kathleen Dungan</td>
<td>Clinical</td>
<td>Diabetes Research Center</td>
</tr>
<tr>
<td>Loic Tchokouani</td>
<td>Retrospective Review of Predisposing Factors for Intraoperative Pressure Ulcer Development</td>
<td>Joshua Lumbley</td>
<td>Clinical</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td>Prashanth Swamy</td>
<td>Novel mechanisms of enhanced alloantibody production require type I NKT cells</td>
<td>Ginny Bumgardner</td>
<td>Basic/Translational</td>
<td>Surgery</td>
</tr>
</tbody>
</table>
How to Find Research Opportunities & Funding?
Information and Help Sessions

Become an active participant in your own future!

✓ 2013-2014 Medical Student Research Program Calendar of Events
✓ Landacre Meetings and Events
✓ **Know your deadlines, plan in advance**
  ▪ One-on-one assistance with prestigious national fellowship applications
    ▪ (e.g., HHMI, Sarnoff, Doris Duke, AOA)
Resources Available

- Medical Student Research Program Office
  - Reach us by email: research.education@osumc.edu
  - Phone: 292-2683
  - In person: 1068 Graves Hall

- Medical Student Research Program Website
  - http://medicine.osu.edu/go/mdsr
  - MDSR Newsletter

- Landacre Research Honor Society Executive Board
  - Maarten Galantowicz, President
  - Brad Schnedl, Vice President

- Landacre Interest Group
  - Juan Santiago-Torres, Interest Group President
Landacre Honor Society
Why Research?
In Medical Students’ Own Words

“I believe that involvement in scientific research during medical school equips me with both the intense skeptical inquiry of a research scientist and the clinical experience necessary to focus my research efforts toward enhancing patient care.”

“With the time that I devote to the research lab, I imagine that my time is devoted to a thousand unnamed patients. These are patients that I will never know and who will never know me, but their foothold rests in my efforts to take on an unanswered question, or a treatment that hasn’t been tried.”
2013-2014 Landacre Honor Society

- Maarten Galantowicz, President
  Maarten.Galantowicz@osumc.edu
- Lauren Sall, Immediate Past President
  lauren.sall@osumc.edu
- Brad Schnedl, Vice President
  bradley.schnedl@osumc.edu
- Kathleen Matic, Secretary
  kathleen.kassouf@osumc.edu
- Samer Salamekh, Treasurer
  samer.salamekh@osumc.edu
- Eric Fichtenbaum, Officer
  eric.fichtenbaum@osumc.edu
- John Vaughn, Officer
  john.vaughn@osumc.edu
- Sankalp Malhotra, MD PhD Officer
  Sankalp.Malhotra@osumc.edu
- Zachary Hing, MD PhD Officer
  Zachary.hing@osumc.edu
Questions