



# 2016 Department of Medicine Summer Program

## *How to Choose a Research Project*

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# Outline

- Describe ACGME research requirement
- Define research
- Examine reasons for doing research
- Discuss types of research projects
- Delineate key factors in choosing a project
- Consider common pitfalls and solutions
- UIC resources
- Q & A panel

# ACGME Common Program Requirements

## Internal Medicine

### IV.B. Residents' Scholarly Activities

IV.B.1. The curriculum must advance residents' knowledge of the basic principles of research, including how research is conducted, evaluated, explained to patients, and applied to patient care. <sup>(Core)</sup>

IV.B.2. Residents should participate in scholarly activity. <sup>(Core)</sup>

[As further specified by the Review Committee]

IV.B.3. The sponsoring institution and program should allocate adequate educational resources to facilitate resident involvement in scholarly activities. <sup>(Detail)</sup>

# What is scholarly activity?

- No uniform definition
- Proposed framework of 4 domains

Component of scholarship	Examples
<u>Discovery</u> = advancing knowledge	Abstract, published paper
<u>Integration</u> = synthesizing knowledge	Case studies, education reports
<u>Application</u> = applying existing knowledge	Participation in guideline panels, national professional society groups
<u>Teaching</u> = disseminating current medical knowledge	Delivering a lecture, curriculum development

# What is research?

- “the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions.”
- Includes the discovery and integration domains of scholarly activity
  - Abstract, published paper, case report, education report

# Why do research?

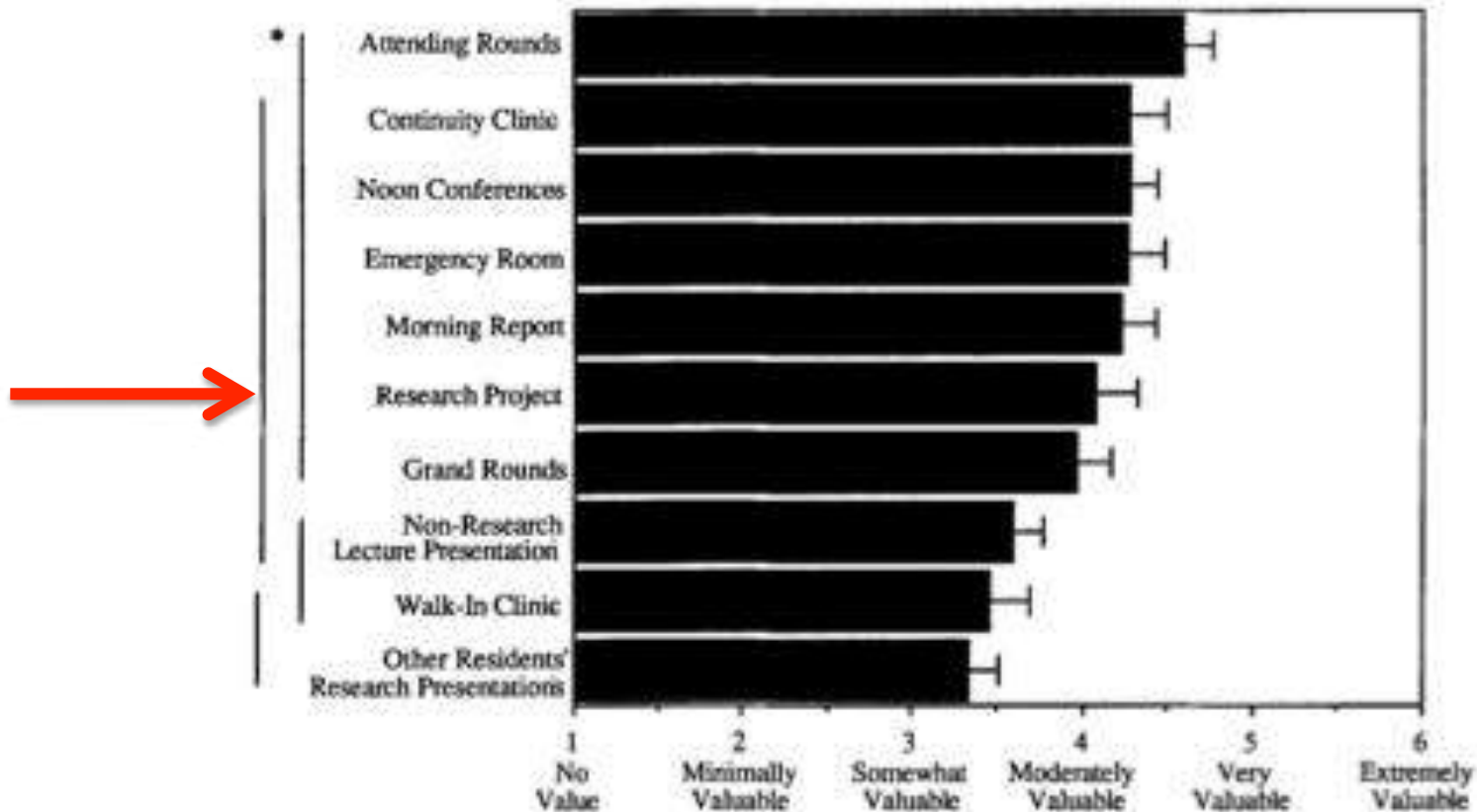
- **Improve your skills as a physician**
  - Conducting proper searches of scientific literature
  - Developing and answering clinical questions
  - Critical appraisal of scientific evidence
  - Application of contemporary knowledge to clinical practice
  - Critical thinking skills
- **Important for your career**
  - Inform your career choices
  - Research during training associated with scholarly work thereafter (e.g., career in academic medicine)
  - Desirable for fellowship opportunities
- **Practical**
  - It's a requirement!
- **Exploring something new....you just never know where it will lead ☺**

# Why do research?

- “In the scientifically guided delivery of health care, physicians make observations, test hypotheses, and experiment with different treatments. In this new millennium, the missions of internal medicine....will be carried out by both physicians and researchers whose effectiveness will be determined by shared educational experiences.”

# Why do research?

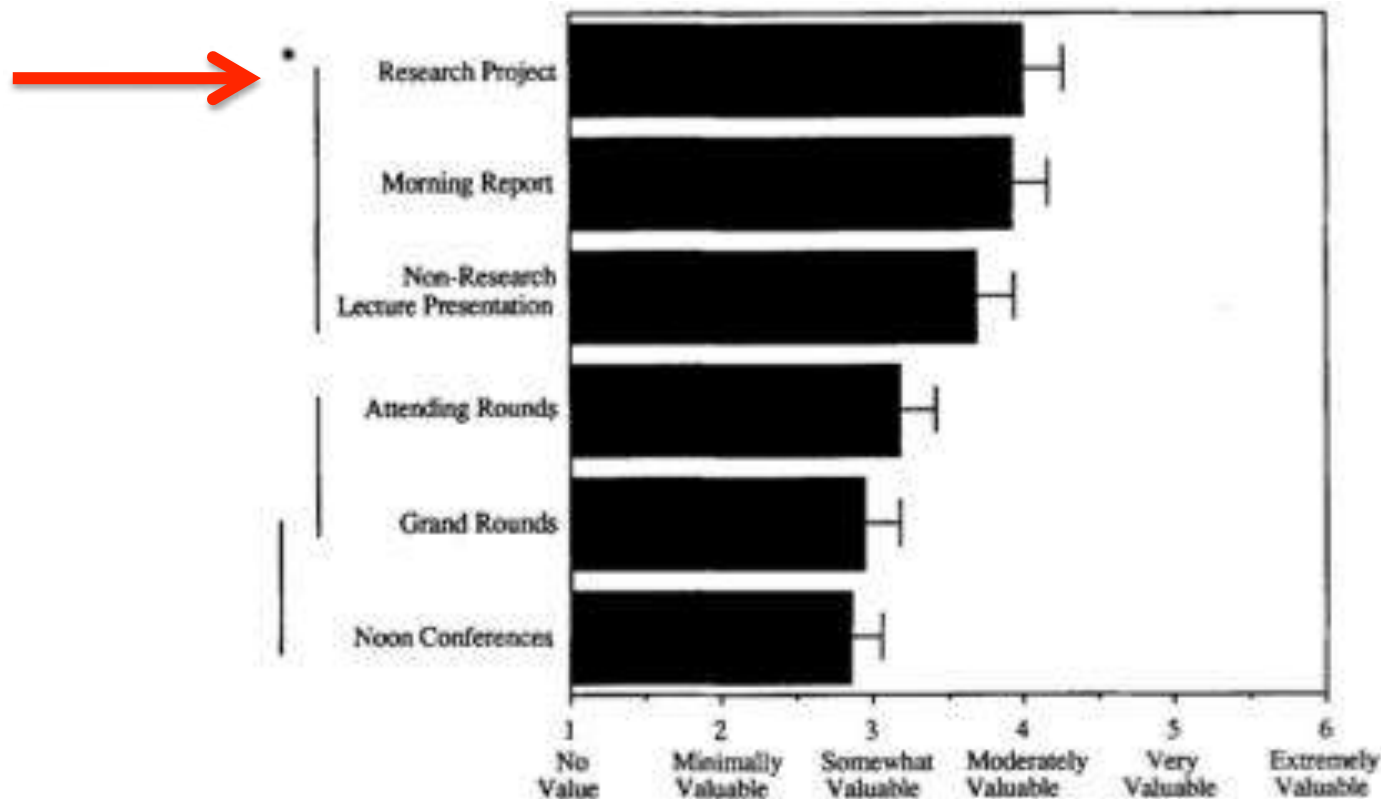
- Learning values of various educational activities according to former IM residents





# Why do research?

- Learning values of various activities in improving their ability to critically read the medical literature according to former IM residents



# Categories of Medical Research

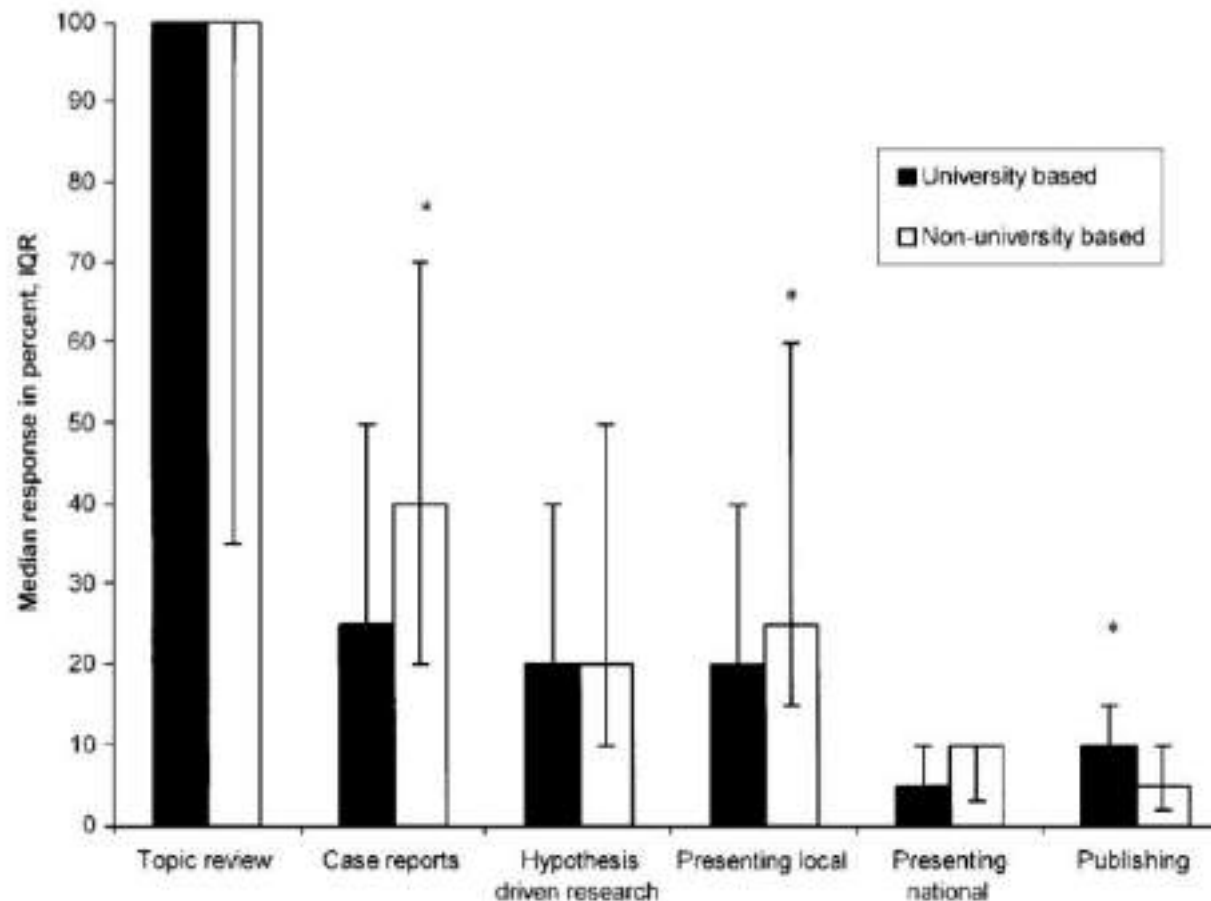
- **Basic**
  - focuses on cellular, molecular and physiological mechanisms underpinning human disease
- **Clinical**
  - Involves patients and focuses on screening, diagnosis, prevention, treatment, and broad epidemiology of disease
- **Translational**
  - iterative feedback loop between basic and clinical research to accelerate knowledge translation from the bedside to the bench, and then back again

# Types of Research Projects

Type	Advantages	Disadvantages
Literature Review	minimal IRB	high level of skill required to write one, some topics endless to review
Case Report/Series	1 <sup>st</sup> author, easy to draft, no/minimal IRB	hard to publish, less scholastically robust
Original Research	academic prestige	Most complex, most IRB
<i>Observational</i>	may use existing data	Weaker evidence
<i>Experimental</i>	strongest evidence	Complex, substantial time required

Each individual must weigh the advantages and disadvantages!

# What seems to be popular?



**FIGURE 1.** Median response and interquartile range, percent of internal medicine residents involved in various scholarly activities during the years 1998 through 2001. \* $P < .05$ , Wilcoxon ranksum test for comparison of university versus nonuniversity programs.

# Considerations in choosing a research project

- Recognize the steps, elements, and timeline required to complete a project

**Table 1** The Three Phases of Resident Research

Time Line		
–12 months	1-2 month(s) (The research elective)	+12 months
<b>Preparatory phase</b> Selecting a topic and formulating a question Finding a mentor Utilizing existing institutional resources Study design and statistical consultation Institutional review board submission	<b>Investigatory Phase</b> Creating a database Data collection Storage and management of data	<b>Synthesis phase</b> Statistical analysis Presentation and publication Reflection on research interest



# Preparatory phase – choosing the project

## Choose a topic

- Draw from your own questions encountered during patient care.
- Discuss your ideas with as many people as possible.

## Formulate a specific question

- Define the population, intervention, and outcome.

## Find a mentor (or two)

- Discuss research, personal, and professional interests with your mentor(s).
- If you don't "click" with someone, look for another mentor.

## Identify existing institutional resources

- Consult with experts in your area of interest.
- Look for existing databases to help answer the question.

## Detail the study design

- Think through each and every step of data collection.
- Anticipate what problems may arise.
- Create a database.

## Complete the institutional review board (IRB) paperwork

- Call the IRB directly for questions related to category of review.
- Make sure your study is HIPAA compliant.
- Determine whether informed consent is necessary (ask the IRB).

## Consult with a statistician

- Clarify what a clinically significant finding would be.
- Perform a power calculation.
- Determine the statistical tools you will need after data collection.

# Preparatory phase – formulating the question

## **Table 3** Elements of an Appropriate Clinical Research Question

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Relevant to clinical practice.

Focused.

Utilizes available institutional resources.

Involves a well defined study population.

Includes a well defined outcome.

Takes career strategy and interests into account.

Invokes curiosity in others.

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# Preparatory phase – parts of the proposal

**Table 5** Elements of a Research Proposal

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Background (1-2 paragraphs)

Hypothesis (1 sentence)

Specific aim (1-3 sentences)

Methods (2-4 paragraphs)

Anticipated results (1 paragraph)

Timeline (1-2 sentences)

Mentor signature of approval

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# Preparatory phase – what’s needed?

- **Skills that you will need.....**

**Table 1. Frequency with Which Residents Rated the Following Skills as Important or Very Important for Completion of Their Research Project and How Well They Believe These Skills Are Taught at Their Residency Programs\***

	Importance, <sup>†</sup> %	Thoroughly Taught, <sup>‡</sup> %
Literature searching	96	38
Abstract preparation	93	13
Critical appraisal	80	35
Medical writing	79	3
Data analysis	73	13
Research design	69	19

*\*There were no statistically significant differences in responses between residents who presented research abstracts and those who presented clinical vignettes.*

*†Five-point Likert scale: 1 = very important, 2 = important, 3 = neutral, 4 = not important, 5 = not very important.*

*‡Three-point Likert scale: 1 = not taught, 2 = taught somewhat, 3 = thoroughly taught.*

# Preparatory phase – what's needed?

## Resources that you will need....and why

- Protected time
- Available faculty mentors
- Adjunctive personnel  
(e.g., statistician/methodologist,  
research assistants)
- Institutional resources
- *No time, no way*
- *Refining ideas, translation of idea  
into actionable format, writing  
proposal*
- *IRB, study design, data collection,  
data analysis*
- *Available patient population, lab  
space*

# Challenges from the perspective of program directors

**Table 1.** Barriers to Resident Research According to Program Directors of 271 Internal Medicine Training Programs, in Decreasing Order of Citation:<sup>\*</sup>

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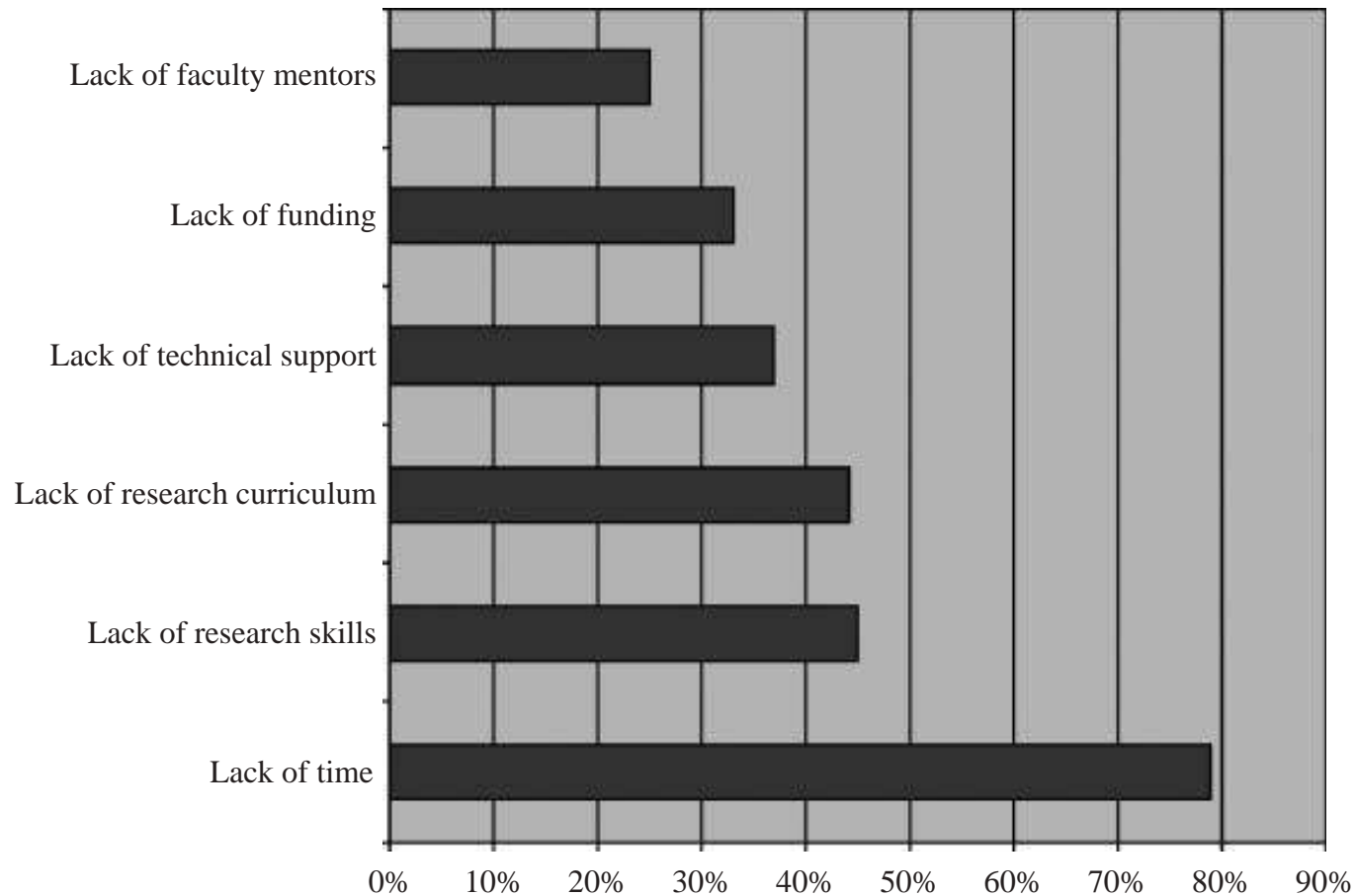
- Lack of resident time
  - Lack of resident interest
  - Lack of money
  - Lack of teaching program or materials
  - Lack of faculty time<sup>†</sup>
  - Lack of computers or software
  - Lack of faculty role models and mentors<sup>†</sup>
  - Lack of faculty interest<sup>†</sup>
  - Lack of a research director
  - Lack of research consultants
-

# Challenges from the perspective of residents

- 123 IM residents surveyed in 1998
  - 28% published
    - Level of residency and prior research experience were important predictors of success
  - 57% of projects remained incomplete or were abandoned
  - Why?
    - lack of time (68%)
    - lack of interest (31%)
    - faculty's lack of interest (20%)

# Challenges from the perspectives of residents

- 138 IM residents surveyed in 2002



# Pitfalls and Ways to deal with them

## Pitfall

- I'm overwhelmed and don't know where to start
- I have no clue about study designs

## Solution

Think of questions based on your clinical experience and review of specific topics

Speak to colleagues (other residents) about what worked for them

No worries...there are folks to help you with design. Focus on formulating a good question....this will inform the study design

Make use of things learned in journal club!

# Pitfalls and Ways to deal with them

## Pitfall

- Too many interruptions by other duties
- Project too complicated
- Project requires too many resources
- Too many investigators
- IRB delays

## Solution

- Request uninterrupted research block
- Target something challenging but not beyond your ability
- Choose projects that do not need new funding
- Keep the investigators few and roles clear
- Try to use a project already approved or one that can be exempt or expedited

# Advice from other residents

- When residents were asked to give advice to interns about selecting and completing a scholarly project during residency, the following themes emerged:
  - 1) start early
  - 2) set aside adequate time
  - 3) adhere to a timeline
  - 4) work with a strong mentor
  - 5) choose a research topic that genuinely interests you
  - 6) keep the project simple yet innovative



# Closing points

- Establish clear goals and expectations for yourself
- Determine what interests **YOU**
- Establish a doable project and also one that is worth doing
- Carefully choose a mentor
- Balance your ideas and your independence with those of others
- Recognize that it really does take a village
- Be open to learning, correction, and even failures

# Potential Ways to Think of Research During your Training

- R1 year: Begin gathering ideas for research project and methodology; consider potential mentors; consider scheduling research rotation during the R2 year or early R3 year.
- R2 year: Narrow down the idea list; contact potential faculty mentor to discuss project and arrange supervision; develop the proposal with mentor and submit to the Research Committee; compile data.
- R3 year: Complete data gathering and analysis; write up findings in consultation with mentor; submit research abstract to scientific meeting; submit report to Research Committee which reviews the report and notifies resident of successful satisfaction of research requirement; submit full manuscript for peer-journal review.

# Institutional Resources to Help Get Started

- Department of Medicine Drupal “Craig’s List” Tool
- UICollaboratory
- CCTS Consults
- College of Medicine Scholarly Activity Incentive

# DOM Scholarly Activity Drupal “Craig’s List” Tool

The screenshot shows the homepage of the Department of Medicine Scholarly Activities website. The header is blue with the department logo and name. Below the header are navigation tabs for Listings, Mentoring, and FAQ. A search bar is located on the left side. The main content area is titled "Scholarly Activities and Opportunities" and contains a table with the following data:

Minimum Training	Type	Title	Division	Site	Stipend	Post date	End date
Student	Research - Clinical	<a href="#">NICU Project Studying Patient/Provider Communication</a>	Academic Internal Medicine & Geriatrics	UI Health	No	07.13.2016	07.23.2017
Student	Research - Clinical	<a href="#">Point of Care Ultrasound</a>	Academic Internal Medicine & Geriatrics	UI Health	No	07.08.2016	07.18.2017
Student	Research - Clinical	<a href="#">Clinical Research in Endocrinology</a>	Endocrinology, Diabetes & Metabolism	UIC	No	06.13.2016	06.30.2017
Student	Research - Basic Science	<a href="#">Racial Disparities Research in Colorectal Cancer</a>	Gastroenterology and Hepatology	UIC	No	06.14.2016	06.30.2017
Student	Research - Clinical	<a href="#">An educational intervention to improve patients communication with their physicians.</a>	Academic Internal Medicine & Geriatrics	Jesse Brown VA	Yes	06.03.2016	06.30.2017
Student	Research - Translational	<a href="#">Host-microbiome interactions with immune-mediated diseases</a>	Pulmonary, Critical Care, Sleep & Allergy	CDM, UIC	No	06.03.2016	06.30.2017

<http://dom-drupal.med.uic.edu/drupal>



# Cardiac Imaging and Heart Failure

Description: Database analysis, Cardiac Imaging and Heart Failure

Note: medical students, residents and fellows are welcome to inquire about the position posting.

**Minimum training:** Student  
**Type of Activity:** Research - Clinical  
**Posting start date:** 2016-06-03  
**Posting expiration date:** Fri, 06/30/2017 - 07:00  
**Site:** UIC and Jesse Brown VA  
**Stipend:** No  
**Contact name:** Mayank M Kansal  
**Contact email:** [mmkansal@uic.edu](mailto:mmkansal@uic.edu)  
**Contact phone number:** [312-996-1913](tel:312-996-1913)  
**Medicine Division:** Cardiology

# Host-microbiome interactions with immune-mediated diseases

Description: Host-microbiome interactions with immune-mediated diseases

**Minimum training:** Student  
**Type of Activity:** Research - Translational  
**Posting start date:** 2016-06-03  
**Posting expiration date:** Fri, 06/30/2017 - 07:00  
**Site:** COM, UIC  
**Stipend:** No  
**Contact name:** Patricia W Finn  
**Contact email:** [pwfinn@uic.edu](mailto:pwfinn@uic.edu)  
**Contact phone number:** [312-996-7700](tel:312-996-7700)  
**Medicine Division:** Pulmonary, Critical Care, Sleep & Allergy



- Online research information management tool managed by CCTS and Elsevier
- Faculty profile built from:
  - Basic demographic information collected from university HR resource database
    - College/department affiliations
    - Scopus publications and NIH funded grant information

<https://uic.pure.elsevier.com/>

# How can UICollaboratory Help?

- Consolidate research information on one platform
- Identify collaborators for funding opportunities and research projects
- Find a potential mentor and supervisors
- Study faculty/researcher's expertise
- Track list of publications, grants and other researchers' scholarly work and "mentions"

# UICollaboratory: Search




The screenshot shows the top section of the UICollaboratory website. At the top right, there is a link for "Help and FAQ". Below this is a banner image of a campus walkway with trees in autumn foliage. On the left side of the banner, there is vertical text: "CENTER FOR CLINICAL AND TRANSLATIONAL SCIENCE" and "UIC" logos. Below the banner, the text "Welcome to UICollaboratory Research Profiles" is centered. A search bar is located below the welcome text, with a dropdown menu currently set to "Everything". The search bar contains the text "Explore profiles, expertise and research at UICollaboratory Rese:" followed by a search icon. Below the search bar, there are six navigation icons with corresponding counts: Profiles (3083), Colleges and Programs (97), Grants (1029), Research Output (8705), Activities (80), and Clippings (1). A red circle highlights the "Everything" dropdown menu in the search bar.

<https://uic.pure.elsevier.com/>






# UICollaboratory: Search



Home **Profiles** Colleges and Programs Grants Research Output Activities Clippings




**James P. Lash**  
Medicine

E-mail  
[jlash@uic.edu](mailto:jlash@uic.edu)

[View Output Profile](#)

**4487**  
Citations

**28**  
h Index



[Overview](#) [Fingerprint](#) [Network](#) [Grants \(0\)](#) [Research Output \(102\)](#) [Similar Profiles \(90\)](#)

# UIC Center for Clinical and Translational Science (CCTS) Service Cores

<b>Service Cores</b>
Letters of Support
Biomedical Informatics
Biostatistics
Clinical Research
Community Engagement
Dissemination & Implementation
Drug Discovery - UICentre
Recruitment & Retention
Regulatory Support
Research Navigation
Research Ethics

## CCTS RESEARCH SERVICE CORES

The CCTS strives to accelerate the translation of scientific discoveries into innovative diagnostics and therapies, disease prevention and improved health care delivery. To accomplish this, the CCTS offers expanded services and resources for investigators at all stages of the translational spectrum, including infrastructure support, funding, and a curriculum for clinical-translational research training.



### How to Request a CCTS Service

The CCTS uses an online system to manage all requests for research assistance. This system ensures that the investigator's request is processed promptly and efficiently and allows for ongoing management of their research projects. The request system also allows

investigators to manage their projects and request new services through an account that is accessible via the web anytime, anywhere.

To request a CCTS service, investigators must:

1. Register as a new user by completing the researcher profile. Please note that a UIC or JBVA email address is required.
2. Under the Service Request Homepage, create a new project by entering your study's details and

# UIC Center for Clinical and Translational Science (CCTS) Service Cores

The screenshot displays the website for the UIC Center for Clinical and Translational Science. The header includes the center's name and navigation links for About, Services, Resources, Career Development, and News. A search bar is located in the top right. On the left, a vertical menu lists various service cores, with 'Biostatistics' highlighted in a dark green box. The main content area is titled 'THE DESIGN & ANALYSIS CORE' and contains the following text:

**THE DESIGN & ANALYSIS CORE**

The CCTS's Design and Analysis Core provides consultative services to clinical-translational investigators in the conceptualization, design, conduct, and analysis of their research studies.

 The Design and Analysis Core provides campus researchers with expanded access to faculty and service personnel with a range of expertise in design and analysis methods and tools. We support the professional development of analytics specialists across campus to increase the availability of quality design and analytic services and to engage quantitative faculty in developing new methodologies for clinical and translational research.

In addition to consultative services, the Design and Analysis Core also encourages the development of collaborative research arrangements between investigators and our team of biostatisticians. Through such collaborations, we hope to contribute substantially to translational research inquiries and the development of novel methodologies.

The Design and Analysis Core is operated in partnership with the University of Illinois Cancer Center.

Learn more about The Design & Analysis Core's featured resource REDCap

The UIC logo is visible in the bottom right corner of the page.

# College of Medicine Resident Scholarly Activity Incentive Program

- Incentive program for work published in peer-reviewed journals with impact factors during their residency training.
- Rewards determined by the Impact Factor of the journal and # of authors:
- Monetary Reward =  
 $(\text{Impact Factor} \times \$500) / \text{Number of Authors}$