Training in Academic Medicine: The American Perspective

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Educational Goals

- We will address and discuss three questions
  - What types of research are needed in Medicine?
  - Which type of preparation is needed for each research approach?
  - How can this be done in the USA?
How is research classified?

- Basic Research/Basic Science
- Clinical Research
- Translational Research
Basic Research/Basic Science

• Laboratory science that provides groundwork for clinical care
• In 1945 NSF defined basic research as:
  • “…performed without thoughts of practical ends. It results in general knowledge and an understanding of nature and its laws” Bush, V. Office of Scientific Development and Research Report to the President 1945
  • While not set in stone this is a definition that still stands
Basic Research/Basic Science

• Taught rigorously in Medical Schools and Graduate Schools throughout the world
• May involve
  • Neurosciences
  • Biomedical Sciences
  • Computational Biology
• Well defined training parameters
• 60% of NIH support goes to basic research, most moneys got to PhD trained scientists
Clinical Research

In 1997 NIH defined Clinical research as:

- Patient oriented research
  - Mechanisms of human disease
  - Therapeutic interventions
  - Clinical trials
  - Development of new technologies
  - *Excludes in vitro* studies that use unlinked human tissue
- Epidemiologic and behavioral research
- Outcomes research and health services research
Clinical Research

- As much as 30% of NIH funding in US goes to Clinical Research as narrowly defined.
- The institutional awards (CRCA), K30’s were launched to help train clinical investigators
- More than 50 training programs have been funded via this mechanism.
- This definition has helped to develop core competencies and metrics to study training programs
Translational Research

• Accepted definition less clear and much newer

• NIH defines as research in two areas:
  • The process of taking discoveries from the laboratory and pre-clinical arena to clinical trials in humans
  • Research aimed at enhancing the adoption of best practices in the community
    • Cost effectiveness of prevention and treatment strategies can also be considered translational research
Translational Research
The American model of Medical Training

- Post secondary school ends at yr 12
- College undergraduate 4-5 yr
- Medical School (traditional) 4 yr
- Post graduate medical education (Int Medicine/GI/Hepatology) 6-7 yr
- MPH may take 2-3 yr
Putting it all together

• Best position is clearly defined early

• Basic science requires PhD tract, combined MD/PhD or a dedicated post graduate fellowship that provides MD with tools to be competitive

• Outcomes research/epidemiology requires dedicated training
My path: Bachelor of Science in Physiology
My path: Master of Science in Physiology
At this point:

• Look for mentorship

• My first mentor did not work in my area:
  • I did tumor immunology with Drs Howard Hubbell and David Gillespie

• Learn and publish
My path: Doctor of Medicine
My path: Internal Medicine
Become a STRONG clinician

• Residency is so broad, time limited

• If possible, publish cases, series, look for doable projects

• Time to define the area which interests you, but don’t be rigid!
  • I fell in love with Hepatology after I went into GI
My path: Gastroenterology and Hepatology
Look for mentors early then mentor

• Lucky to have worked closely with Dr Jorge Rakela
• Began to pursue with his guidance my own agenda
• Began Mentorship of my own fellows
  • Kapil Chopra
  • Jawad Ahmad
Elements that are requisite

• May be defined at different time points
  • Study design
  • Data collection
  • Statistics
  • Research ethics and integrity
  • Protection of human and animal subjects
  • IRB protocol experience
  • Intellectual property protection
  • Grant writing
  • Regulatory affairs
My path:
Pointers and Issues for the future

• Mentorship in Research is **invaluable**
• Your curriculum needs to be personalized
• Focus needs to be very clear, but flexibility may help
• Seek varied experiences and excellence
• Medical degree is valuable tool
Hurdles

• Funding, funding, funding.

• May need to go to where the experts live

• Initially, academic work does not get done at work.
  • Recognize that there will be long hours and weekends when you will work
  • Thus pacing is also very key