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Baylor College of Medicine

Texas Children's Hospital

Developing Physician Scientists During Pediatric Residency

APPD Spring Meeting 2019

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Yale-New Haven Children's Hospital

Boston Children's Hospital

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National Physician-Scientist Collaborative Sub-workgroup

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Learning Objectives

- Describe the training needs of physician scientists
- Discuss elements of residency training for physician scientists with expert-facilitated small group discussions
- Describe residency program models that develop and prepare physician scientists for fellowship and junior faculty positions

Think-Pair-Share

- How do you define a physician scientist?
- What are a few successes your institution has had in supporting physician scientists-in-training?
- Where are the challenges?

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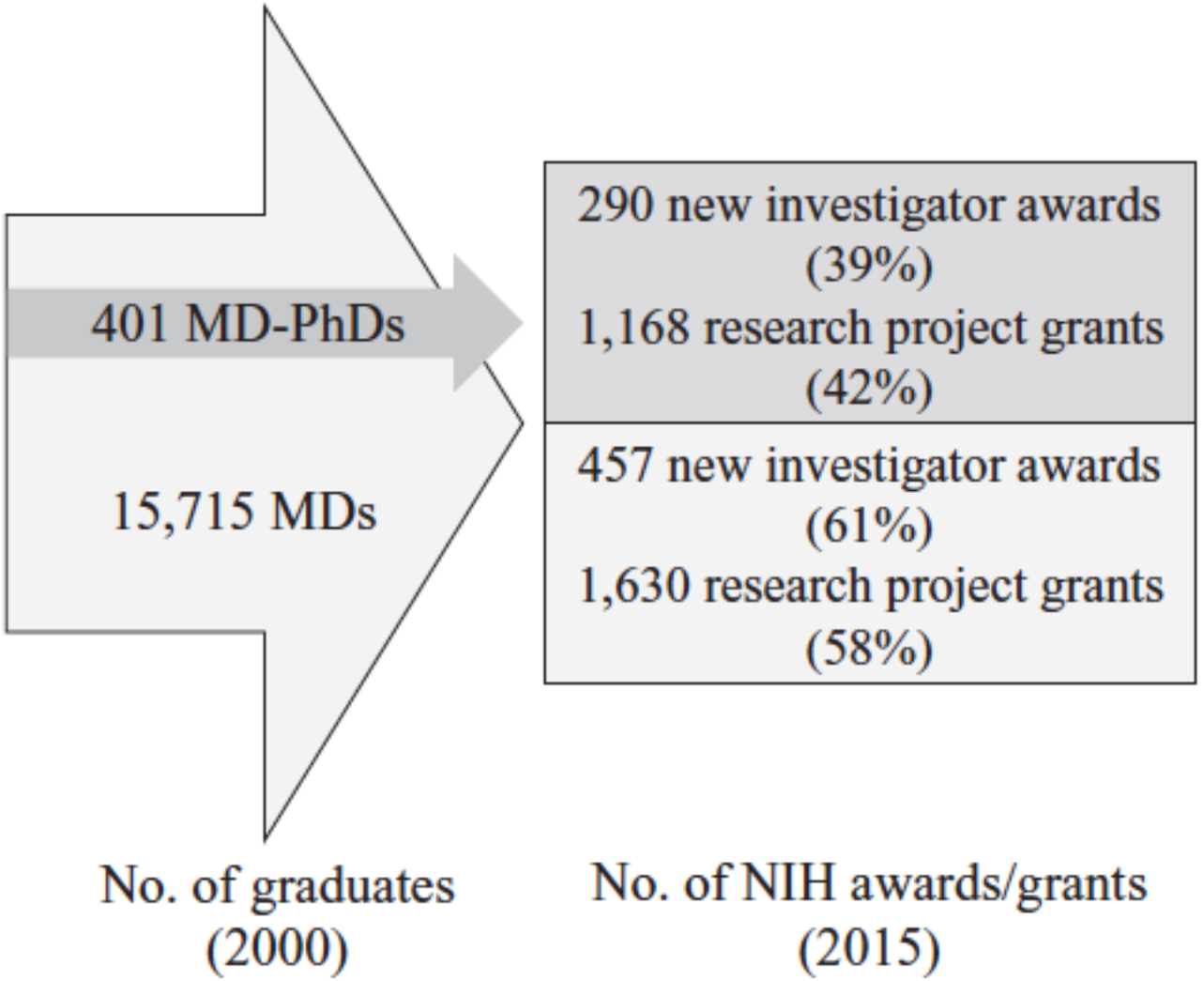
Who are physician scientists?

- Dedicate their careers to advancing our understanding of diseases and developing new therapies and measures to improve health
- Areas of research may include basic/translational research, clinical research, or other areas
- Often, funded investigators
- Also known as: physician-investigators, clinician scientists, clinician-investigators, and clinician researchers

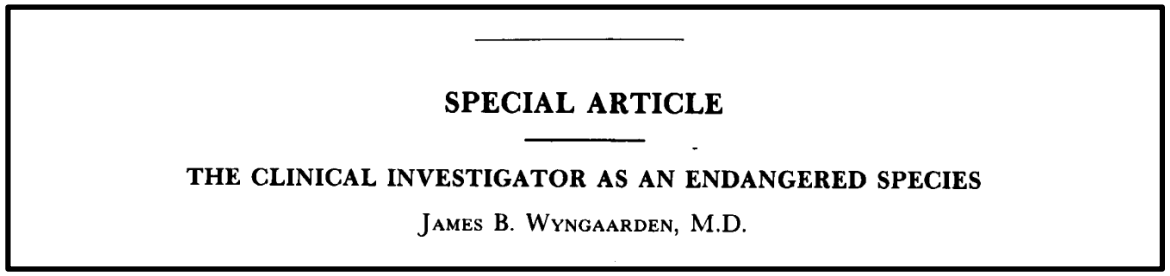
Grant funding for MDs vs. MD/PhDs



Hall et al, Academic Medicine, 2017

Leaky Pipeline for Physician-Scientists

Initial Report:



SPECIAL ARTICLE

THE CLINICAL INVESTIGATOR AS AN ENDANGERED SPECIES

JAMES B. WYNGAARDEN, M.D.

NEJM, 1979

Two decades later:

The physician-scientist:
An essential — and fragile — link
in the medical research chain

Leon E. Rosenberg

JCI, 1999

"In the absence of physician-scientists, the bridge between bench to bedside will weaken-perhaps even collapse"

NOTES FROM THE ASSOCIATION OF
MEDICAL SCHOOL PEDIATRIC DEPARTMENT CHAIRS, INC.

Patching the Pipeline: Creation and Retention of the Next Generation of Physician–Scientists for Child Health Research

David N. Cornfield, MD[1], Robert Lane, MD[2], Norman D. Rosenblum, MD[3], Margaret Hostetter, MD[4], Alan Jobe, MD, PhD[4], Kurt Albertine, PhD[5], Judy Aschner, MD[6], and Steven H. Abman, MD[7]

- **Addressing demographic changes-** 73% women, 2009—gender pay differences, childcare, family-friendly career paths, faculty mentorship
- **Structure Conflicts of Interest** – institutional constrained funding results in increasing clinical responsibilities competing with research time
- **Regulatory Fatigue in Training & Oversight-** increased clinical documentation over time, individualized clinical and AGME requirements increase research time/engagement during residency & fellowship
- **Generational Issues-** lack of transparency in tenure and promotion
- **Financial debt of trainees-** increased debt burden of graduates

J. of Peds, 2014

The Importance of Physician-Scientists

FASEB
Federation of American Societies for Experimental Biology


Physician Scientists

Assessing the Workforce

Howard H. Garrison, PhD and Anne M. Deschamps, PhD

Workforce Report, 2013

"Physician-scientists make a unique contribution to biomedical research and the level of their participation is of high interest to educators, research institutions, and policymakers…"

Patching the Pipeline: Success Outcomes from the NIH Physician-Scientist Fellowship Program

- Pediatric Scientist Development Program (PDSP)
- Career Development Program During Fellowship
- Protected Research Time in Fellowship
- Joint Partnership: Association of Medical School Pediatric Department Chairs, NICHD, March of Dimes, American Academy of Pediatrics, American Pediatric Society, Pediatric hairs of Canada, SickKids Foundation

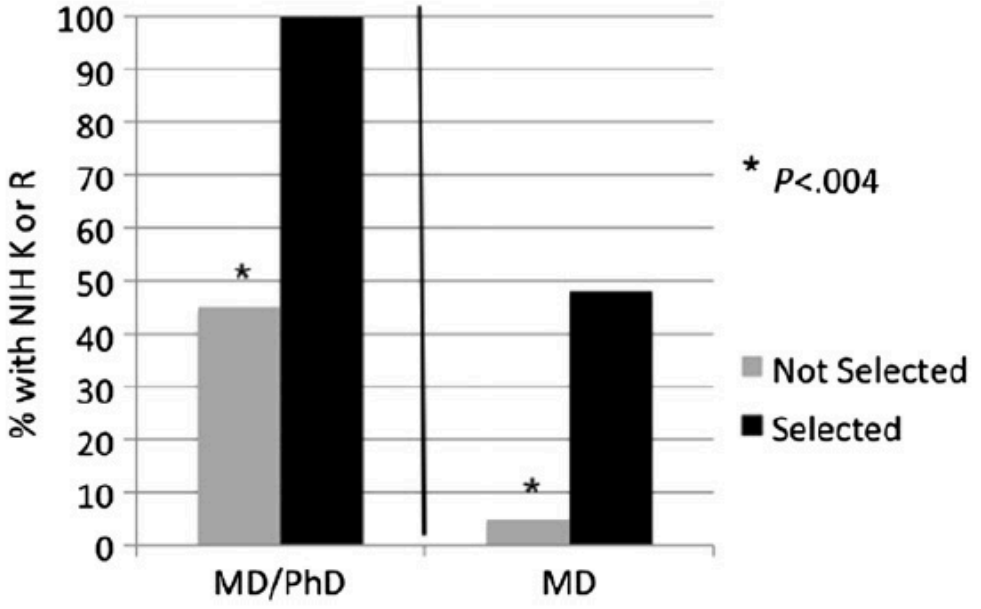


Figure. NIH funding comparison of MD/PhDs and MDs selected for the PSDP with candidates who applied but were not selected. *K*, K award; *R*, R award.

Hostetter, Margaret. J. Peds., 2012

The role of residency programs

- Important mission to train physician scientists
- Significant opportunities and challenges throughout physician scientists' training and careers
- Possible pathways: American Board of Pediatrics' Integrated Research Pathway (IRP) and Accelerated Research Pathway (ARP)
- Competing needs: clinical training, research training, work-life integration and wellness
- Communication between residency & fellowship programs

Metrics for developing physician scientists

Characteristics and Metrics of Success for Three Priorities for Future Pilot Programs to Recruit, Retain, and Sustain the Clinician–Investigator Workforce

Research in residency	Research on-ramps for health professionals	Faculty networks
• Research and clinical activities leading to research and clinical competence and board eligibility • Medical board approval for research in residency models in different specialties • Postgraduate year salary support • Accommodations for a range of prior research experience • Mentor development • Continued research support during fellowship	• Research opportunities at multiple career stages • Maximized support for candidates from underrepresented groups • Research doctorate following health professional training • Research skills taught in master's programs • Coordination of opportunities across institutions	• National links between clinician–investigators from underrepresented groups who are few in number at any individual institution • Connections by specialty, gender, or underrepresented group • Nominations by institutions • National networking and career sponsorship • Enhanced research efforts • Leadership needs addressed
Broad metrics of success[a]		
Short- and intermediate-term: Research publications and presentations; proportion of effort in research; participation by diverse groups Long-term: Research grants (National Institutes of Health or other); jobs that involve research; patents, clinical trials, investigational new drugs, contracts; impact on scientific discovery and health		

Hall et al, Academic Medicine, 2017

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Facilitated small groups

- 2 rotations, 15 minutes each
- Group 1: Mentorship, peer mentorship and personal support
- Group 2: Clinical training and the ARP and IRP pathways
- Group 3: Goals and objectives for research training in residency
- Group 4: Funding and infrastructure

Large Group report-out

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Models of Physician Scientist Residency Programs

Alternate paths for physician-scientists

1. Majority of physician-scientist trainees opt for categorical or ABP-approved pathways (ARP/IRP)
2. “Significant” prior research experience
3. Combined programs (Peds-Neuro, Peds-Genetics, etc.)
4. Non-traditional subspecialty paths

Lessons learned

1. Early identification of subsequent training goals
   - Pediatric subspecialty vs other
   - What paths exist in your program?
2. Consideration of future clinical training
   - Will further training involve clinical time?
3. Clear expectations for research mentors and teams of mentors
   - Look across your institution, but match them with people who know your training program

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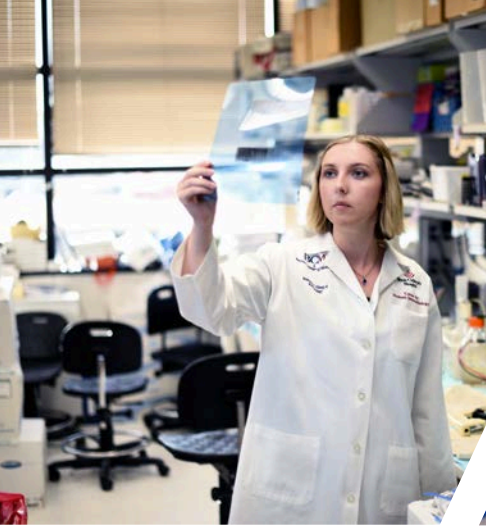
Lessons learned

4. Build a community of scientists
   - What other programs can you partner with?
5. Consider the continuum of training
   - Post-residency experiences (post-doc, MSF)
6. Plan how to support them if they take an alternate route
   - Continuing mentorship after residency




Pediatrician-Scientist Training & Development Program

<u>Goal:</u> deconvolute the pathway to becoming and independent and successful Pediatrician-Scientist

<u>Curriculum:</u> Integrated Research Pathway

<u>Mentorship & Support:</u> Residency and Fellowship

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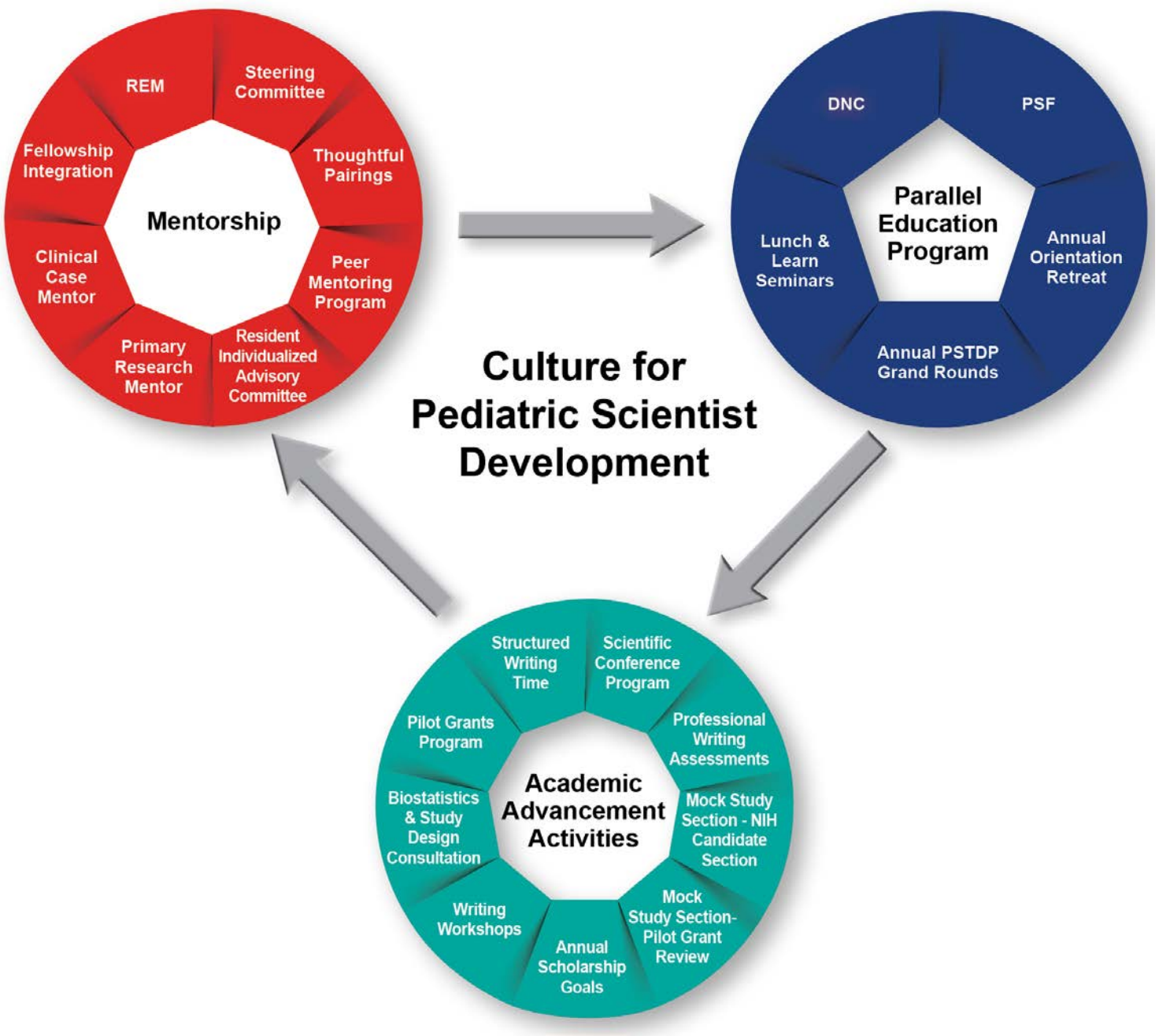

Mentorship

- All residents paired with three mentors

Culture Building Events

- Physician-Scientist Career Development noon conference
- Evening physician-scientist networking seminar
- Annual Retreat

Academic Advancement Activities

- Case Report Writing Workshop
- Pilot Grants Program

Burns *et al* 2016, 2019, Journal of Pediatrics

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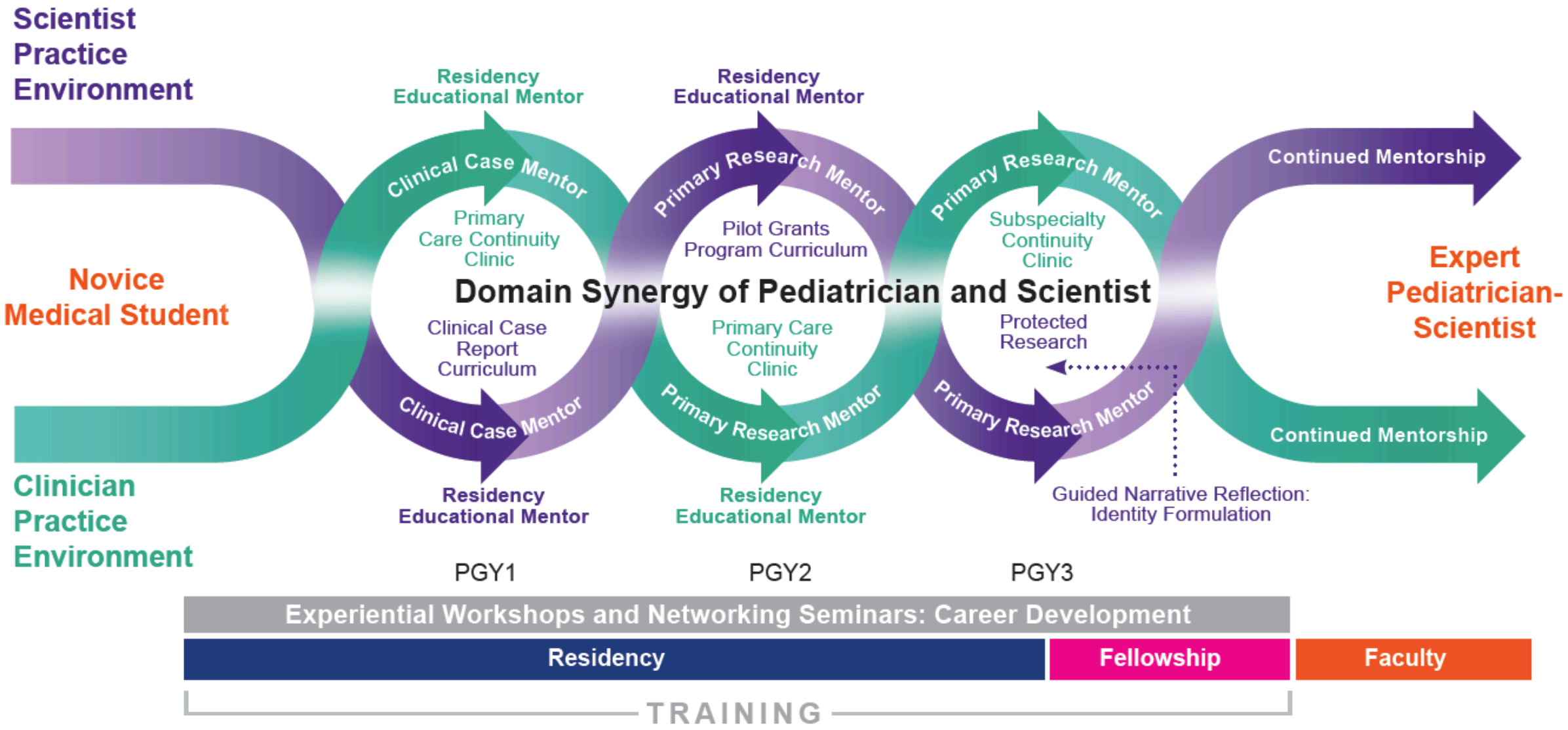

Burns *et al* 2016, 2019, Journal of Pediatrics

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Physician Scientist training across the spectrum

- Bringing together physician scientist faculty, fellows and residents
- Mentoring
- Career development
- Community-building
- Curriculum Development
  - Scholarly Concentration Tracks (with Block Rotations) to support residents and fellows
  - Scholarship Oversight Committees
  - Research Boot Camp for residents and fellows
  - Grant-Writing Series (Internal Grants, K Grants, R Grants)

Physician Scientist training across the spectrum

- Research Resources
  - Clinical Librarian
  - Statistical Support
  - Grant-writing
- Funding
  - Dedicated $10,000 Grant for MD/PhD Residents
  - Internal Grant Funding for Fellows
  - Bridge Funding for Instructors (3 years as people apply for a Career Development Award)

Optimizing research on the categorical pathway

- Up to 10 months of research during categorical training while fulfilling all ACGME requirements
- Allows trainees to take the ABP board exam in October after graduating residency
- With IRP pathway, residents have to complete a full year of clinical fellowship before taking the pediatric boards
- Balance in service and education for the resident and the program

Summary

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Thank You!