The Pediatric Scientist Development Program

PSDP: Building the next generation of pediatrician scientists

Frontiers in Science Symposium

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The Importance of Developing Pediatrician-Scientists

- Children are “therapeutic orphans” in the translational pipeline
- Physician-Scientists play a critical role in connecting discovery research with clinical observations and patient impact.

2019 Nobel Prize in Physiology or Medicine: Pediatrician-scientist: Gregg Semenza, MD, PhD

Discovered how the body’s cells sense and react to low oxygen levels

- Targets for treatments for cancer, diabetes and heart disease
What is the outlook for Pediatrician-Scientists?

- Declining number of trained pediatricians who go on to become independent scientists
- NIH independent investigator awards (R01s) in pediatric hospitals have declined >30% during the past 10 years
- 63% of all pediatric R01 grants are granted to just 15 institutions
- 58% of NIH funded investigators are full professors
  - 24% hold Chief, Chair, or Dean positions
- NICHD research training and career development grants (K08, K23, T32, F32) declining
NIH K08s awarded each year

63% Decline in MDs
The Pediatric Scientist Development Program
Building the next generation of pediatrician scientists

▸ **PSDP Mission**: To develop the next generation of diverse pediatrician-scientist leaders through exceptional research training and a robust, multilevel mentorship environment

▸ **Goals**
  ▶ Research training for subspecialty pediatricians
  ▶ Address problems central to child health
  ▶ Combat the declining number of trained pediatric physicians who go on to become independent scientists
  ▶ 2-3 years of mentored research training with >90% protected research time
The Pediatric Scientist Development Program (PSDP) is a physician-scientist training opportunity supported by the American Medical School Pediatric Department Chairs and allied funding agencies including:

- National Institute of Child Health and Human Development (NICHD) K12
- American Academy of Pediatrics (AAP)
- American Pediatric Society (APS)
- March of Dimes (MOD)
PSDP: >30 yr NIH funding track record

PSDP Alumni through 2019
n=211

NIH-funded PIs 52%

- K-to-R (Total) Conversion (52%)
- K-to-R01 Conversion (39%)

*based on number of completed K awards
PSDP Return on Investment
FY 1987—2018

NIH Program Funding (total costs)  $41,504,765
Total PSDP Alumni NIH Awards  $586,366,046

ROI  >14
Recent PSDP alumni achievements

PSDP Recent Awards

- UC Presidents Award, 2020
- Harold Amos Medical Faculty Development Program Career Development Award (Robert Wood Johnson Foundation), 2020

Erlinda ‘Chulie’ Ulloa, MD, MSc
(3rd year PSDP fellow)

- SPR Fellows Clinical Research Award, 2019
- American Academy of Pediatrics Emerging Leader in Adolescent Health Award, 2019

Jason Nagata, MD
(2019 PSDP alumni, Assistant Professor, UCSF)
PSDP graduates are academic leaders in pediatrics

PSDP Graduate High-Profile Leadership Positions (as of 2018)

- US Government (5)
- Deans & Associate Deans (4)
- HHMI Investigators (2)
- Institute of CTSA Directors (4)
- Hospital Leadership (4)
- Pediatric Department Chairs (4)
- Division Directors (20)
- Program Directors (16)
- Training Directors (8)
- Private Foundations (1)
- Institutional Research Directors (3)
- Industry (8)
PSDP alumni serve academic missions throughout the US and Canada

Where are they now?
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Where are they now?

Anca Pasca, MD (2018)
Assistant Professor of Pediatrics
Stanford

Research: Understanding molecular mechanisms underlying neurodevelopmental disorders associated with premature birth
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Where are they now?

Laurie Steiner, MD (2010)
Associate Professor of Pediatrics
University of Rochester

Research: Utilizing genomics techniques to study erythroid maturation with an emphasis on studying how specific DNA sequences, DNA binding proteins, and chromatin structure interact during erythropoiesis
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Where are they now?

Deepak Srivastava, MD (1995)
President, Gladstone Institutes

Research: Focusing on the gene networks that guide the development of the heart, seeking to understand how aberrations in these pathways can cause congenital heart disease
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Where are they now?

Sing Sing Way, PhD, MD (2005)
HHMI Faculty Scholar
Cincinnati Children’s Hospital Medical Center
Pauline and Lawson Reed Chair, Division of Infectious Diseases
UC Department of Pediatrics

Research: Investigate the immune basis responsible for enhanced susceptibility to infection during pregnancy, the immune pathogenesis of pregnancy complications
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Where are they now?

Mustafa Khokha, MD (2002)
Associate Professor of Pediatrics
(Critical Care) and of Genetics
Yale School of Medicine

Research: We hope to discover the genes that lead to birth defects with the hope of improving our understanding of how human development (embryology) occurs.
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Where are they now?

Elena Hsieh, MD (2015)
Assistant Professor of Pediatrics
UC Denver

**Research:** Address mechanistic and translational questions in human immunology using high-dimensional single-cell mass cytometry and ex-vivo cellular manipulation to gain a deeper understanding of normal immune function, and dysregulated immune processes in immunodeficiency, autoimmunity
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Where are they now?

Ophir Klein, MD, PhD (2007)
Professor, Orofacial Sciences
UCSF

Research: Focus on understanding how organs form in developing embryos and how their regeneration normally occur in the hope of one day treating diseases that result from abnormalities in these processes.
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Where are they now?

Sharon Nachman, MD (1989)
Chief of Division of Pediatric Infectious Diseases
NIH IMPAACT Network Director
Renaissance School of Medicine
Stony Brook University

Research: Leader in the area of pediatric infectious disease and the treatment of children with AIDS, flu, and measles. She has conducted international trials in the areas of new vaccines, Lyme disease, and AIDS
Setting the bar high! The first PSDP scholars shown here in 1987
Let's keep the PSDP family growing!

Photo courtesy of Scott A. Rivkees, MD
FIS / PSDP Leadership Transitions in 2019

FIS
- Alan Schwartz, MD, PhD
- Wade Clapp, MD

PSDP
- Margaret Hostetter, MD
- Sallie Permar, MD, PhD
PSDP under new leadership: Areas of focus

- PSDP branding & communication
- Increase number and quality of applicants
- Maintain and expand PSDP support
96% of Respondents Are Concerned About the Decline in Pediatrician-Scientists

Addressing Gaps in Pediatric Scientist Development: The Department Chair View of Two AMSPDC-Sponsored Programs

Journal of Pediatrics
Barrett K, Clapp W, Permar S et al, 2020

(n = 66 responders)
Barriers to nomination to PSDP

- lack of research infrastructure
- lack of research mentors
- lack of funds to support PSDP year 3
- lack of division leadership interest
- limited feasibility clinically
- lack of program awareness
- lack of trainee interest
- "no clinical time" requirement
Networking with associated pediatric organizations for higher exposure

- AAP (e-newsletter, Twitter, Instagram, direct emails PDs, website link)
- APS (e-newsletter, Twitter)
- AMSPDC (e-newsletter, Twitter, website link)
- APPD (e-newsletter)
- SPR/PAS (e-newsletter, Twitter, standing research pathways programming)
- Thrasher

- Website: https://amspdc-psdp.org/
- Social media (Twitter): @PSDP_AMSPDC
- Build PSDP alumni network

New Logo:
Building the PSDP alumni network

- Annual Newsletter – established March 2019 with March 2020 coming out soon!
- FIS meeting to include PSDP graduate speakers
- PSDP Alumni mentorship program
  - Unique opportunity for both local and national mentoring
  - Vertical Mentorship

Diagram:
- PSDP Alumni (16)
- FIS residents (10)
- Potential applicants (5)
PSDP Clinical Requirements

Current Rule:

The PSDP stipulates that each fellow must dedicate 100% effort to research in the first two years of the program.

- If conducting a research project that would be enhanced through patient contact, you may request up to 10% clinical time.

PSDP fellows who receive a third year of funding may request up to 15% of their time for clinical work.

- Clinical time will now be tracked in progress reports.
Increasing number and quality of PSDP applicants: FIS Pipeline

**Goal**: Increase the number and diversity of pediatric residents pursuing fellowship & PSDP training

- **Interventions**
  - Provide FIS residents with PSDP alumni mentor
  - Direct emails to 2018-2019 FIS residents with PSDP application information
  - Presentation at Assoc of Pediatric Program Directors (APPD)
  - Target geographic locations where applicant pool is low
PSDP -> FIS Pipeline

FIS Residents, 2015—2019

- Applied for PSDP, n=12

FIS Residents Entering PSDP

- Class of 2017: 3
- Class of 2018: 2
- Class of 2019: 1
- Class of 2020: 2
- Class of 2021: 3
- Class of 2022*: Anticipated

*Anticipated
**Goal:** Increase the number and diversity of pediatric residents pursuing fellowship & PSDP training

- Increase the FIS resident attendee slots by 75-100% through increased funding (Wade Clapp)
- Chairs with URM candidate can nominate 2 residents to attend
- Diversify the speaker panel, expand the breadth of research topics presented
- Increase PSDP fellows/FIS resident interactions at meeting
Number of FIS Trainees (2016-2019): *Special call for URiM applicants resulted in an increase in diversity.*

- In 2018, we conducted a pilot experiment to focus on engaging underrepresented in Medicine (URiM) residents
  - Special call for URiM proved to be a major success with 65% of the FIS attendees were URiMs and 75% were females
Increasing applicant numbers

Average of 10 PSDP applicants/year over last 5 years

Average acceptance = 5.8 fellows/year

Goal: 20 apps/year within 3 years

Application deadline March 10th
How did you hear about the PSDP Program?

#1 – Alumni
#2 – Program Faculty
#3 – Chair
PSDP: Maintaining and growing our support

- PSDP currently has 5 2yr fellow slots funded by the NICHD K12
  - Represents a decrease of funded fellowship slots from 17 to 10,

- NIH funds can support only US citizens.
  - With non-NIH funds, we can support diverse non-citizen candidates
We need you to help advocate!

Pediatrician Accelerate Childhood Therapies (PACT act)

- An extension the 21st Century Cures Act (2016), which established the Next Generation Researchers Initiative
  - gaps in the pipeline posing threat to next generation of cures for children

- Cited cuts in the number of training slots in NIH-supported programs
  - 60% reduction in the Child Health Research Center program
  - 40% reduction in the Physician Scientist Development Program

- Need congressional leaders to sign on
PSDP: Maintaining and growing our support

- **AMSPDC support for annual meeting expenses**
  - Re-aligned budget

- **Letter writing campaign to pediatric research-oriented foundations (Oct-Nov 2019)**
  - 34 letters sent (25k, 50k, 100k, or 250k)

- **In discussions of support for 2021/2022 (pending board approval):**
  - Burroughs Wellcome Fund
  - Cystic Fibrosis Foundation

- **Other foundations with interest beyond 2021:**
  - Kids with Cancer Society
  - National CMV Foundation
Thank you to our

PSDP Steering Committee

Questions?

Sallie Permar, PSDP Director: 

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Michelle Cooley, PSDP Coordinator:

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AMSPDC and Chair support is critical to this program

Thank you!