The Pediatric Scientist Development Program

PSDP: Building the next generation of pediatrician scientists

Frontiers in Science Symposium

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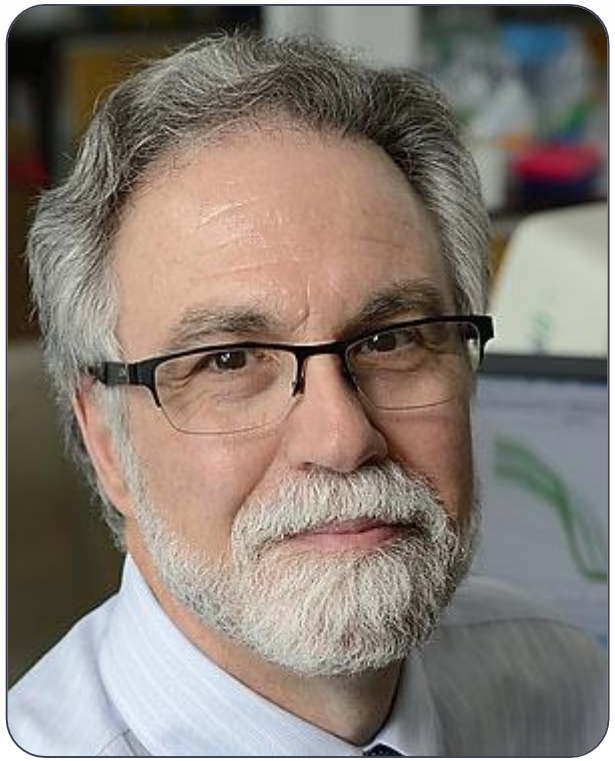
Sallie Permar, MD, PhD
Professor in Pediatrics, Immunology, and Molecular Genetics and Microbiology
Associate Dean, Office for Physician-Scientist Development
Program Director, PSDP

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.



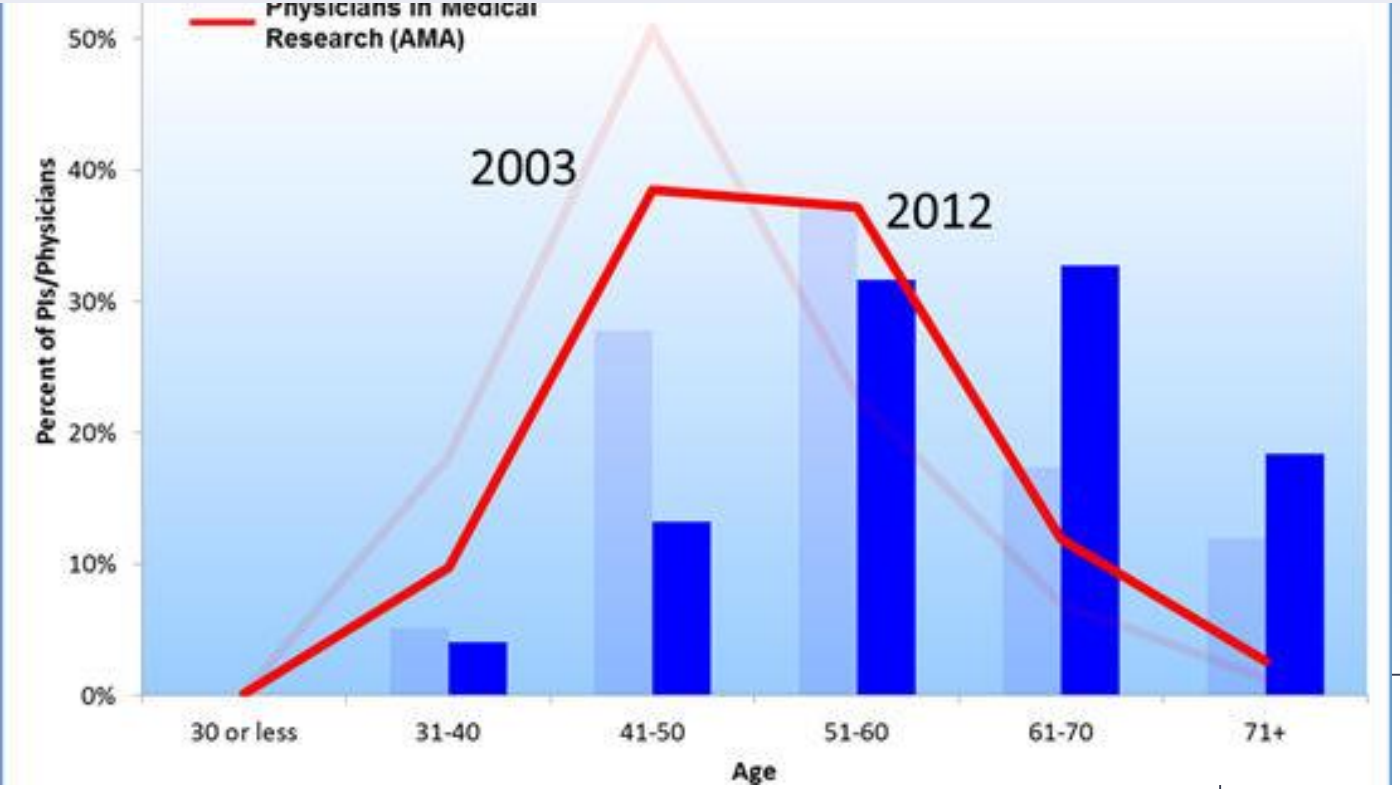
<u>2019 Nobel Prize in Physiology or Medicine</u>:
Pediatrician-scientist: Gregg Semenza, MD, PhD

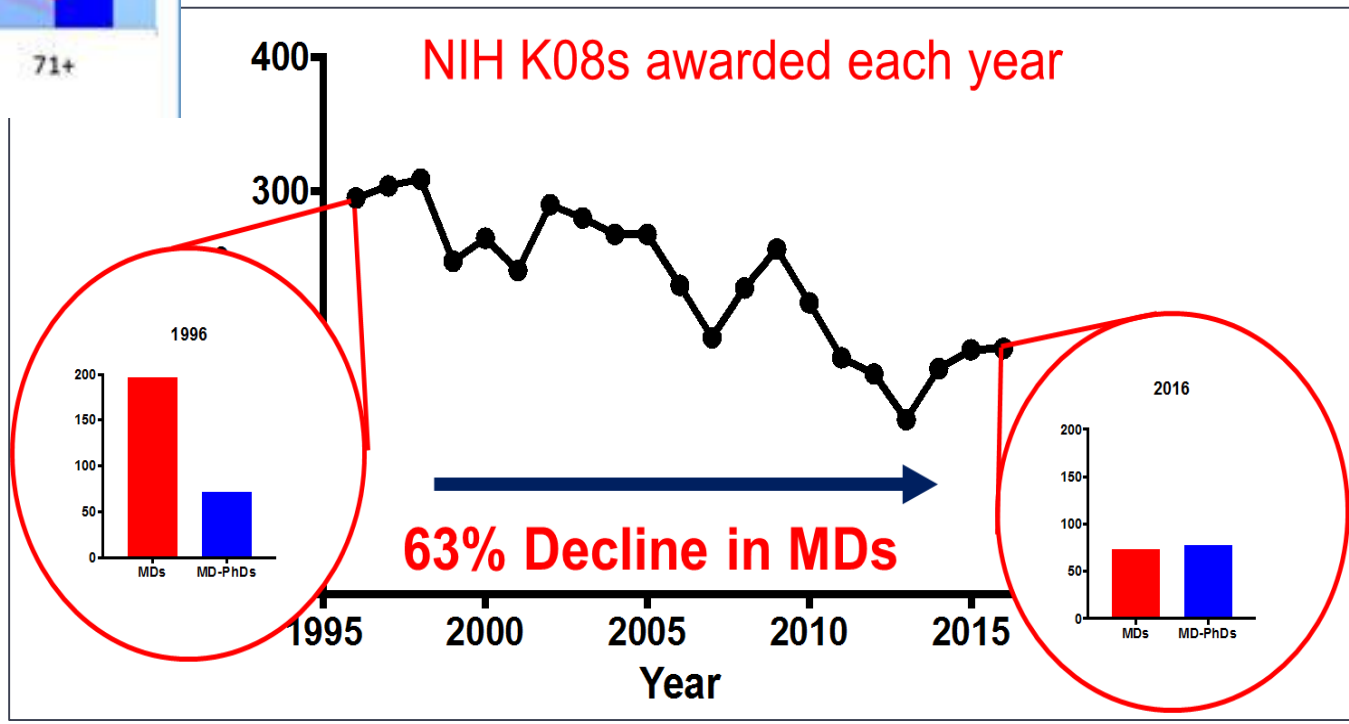
Discovered how the body's cells sense and react to low oxygen levels

- **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


Physicians in Medical Research (AMA)
2003
2012
50%
40%
30%
20%
10%
0%
Percent of PIs/Physicians
30 or less
31-40
41-50
51-60
61-70
71+
Age


NIH K08s awarded each year
400
300
1996
200
150
100
50
0
MDs
MD-PhDs
63% Decline in MDs
1995
2000
2005
2010
2015
Year
2016
200
150
100
50
0
MDs
MD-PhDs

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

Pediatric Scientist Development Program

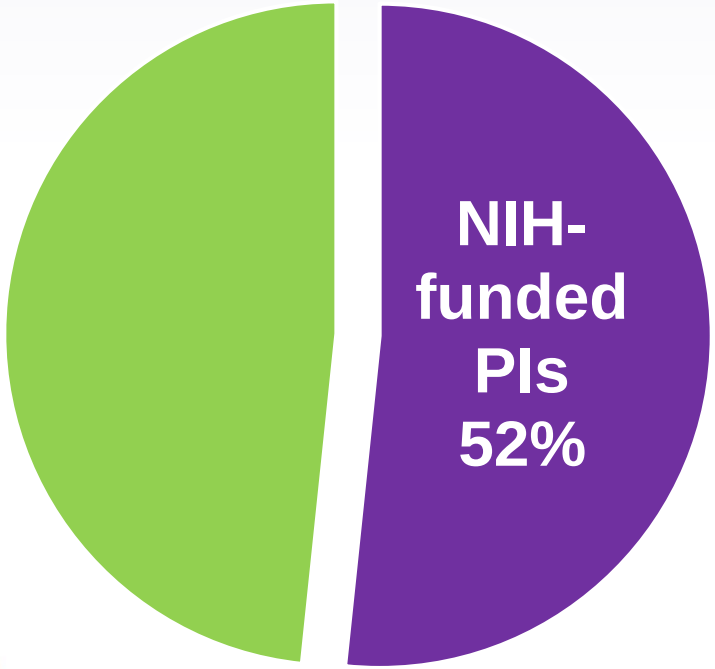
PSDP Partnerships

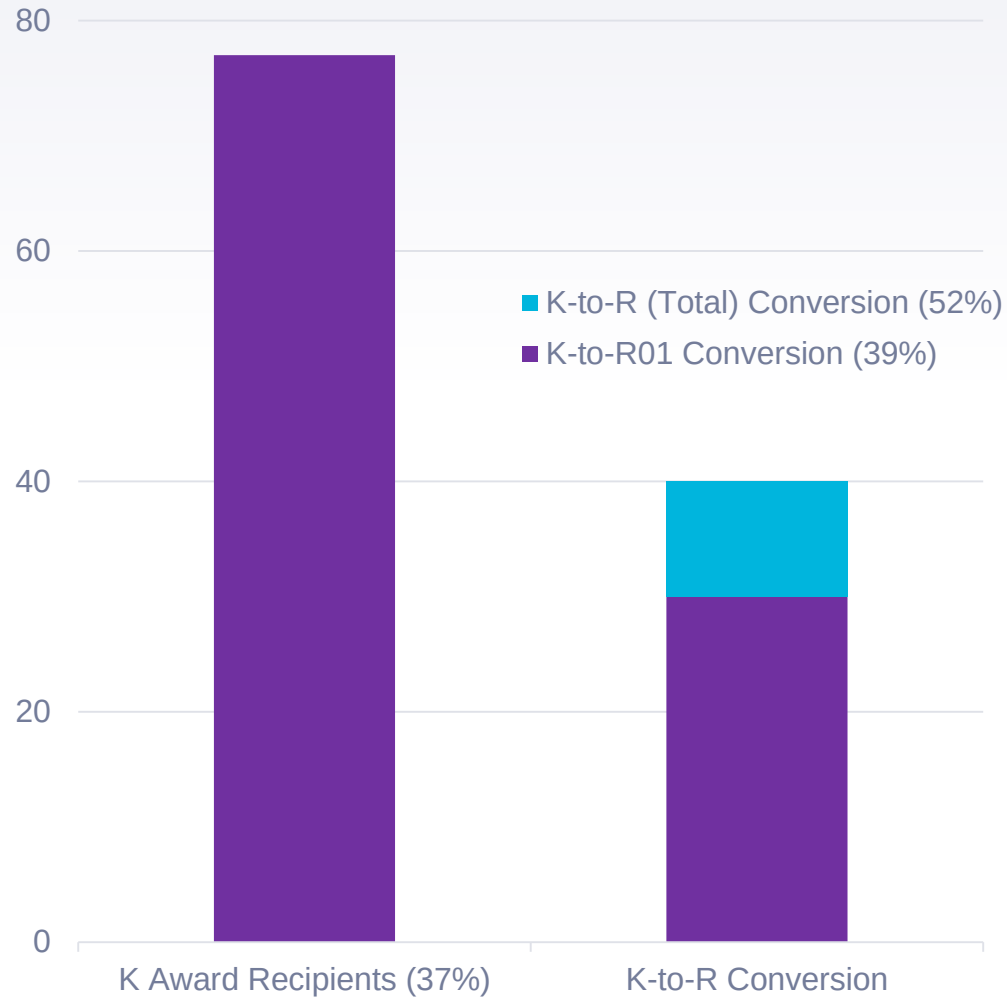
The Pediatric Scientist Development Program (PSDP) is a physician-scientist training opportunity supported by the American Medical School Pediatric Department Chairs and allied funding agencies including:

- *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

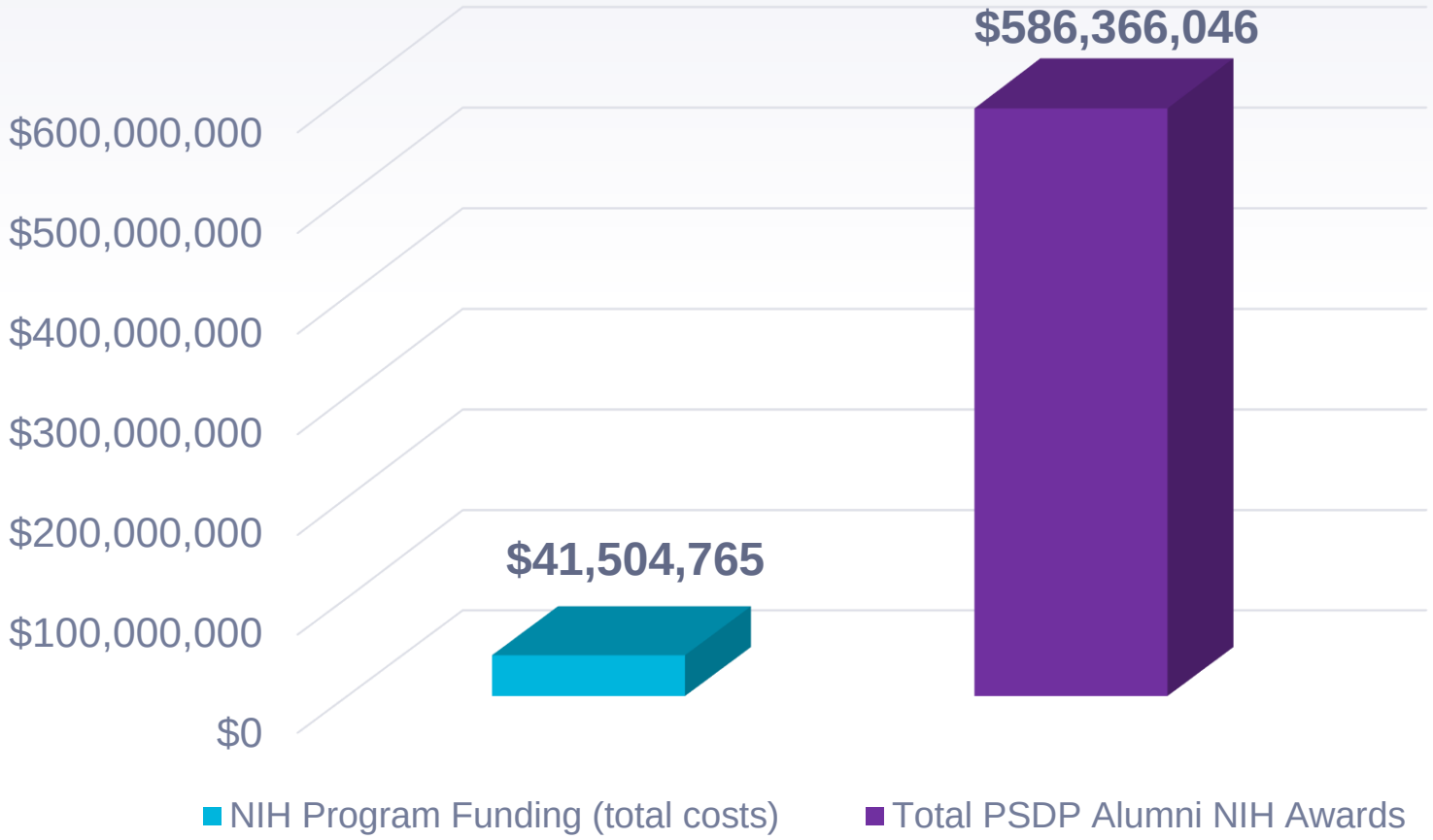
PSDP Alumni through 2019
n=211





***based on number of completed K awards**

PSDP Return on Investment
FY 1987—2018



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

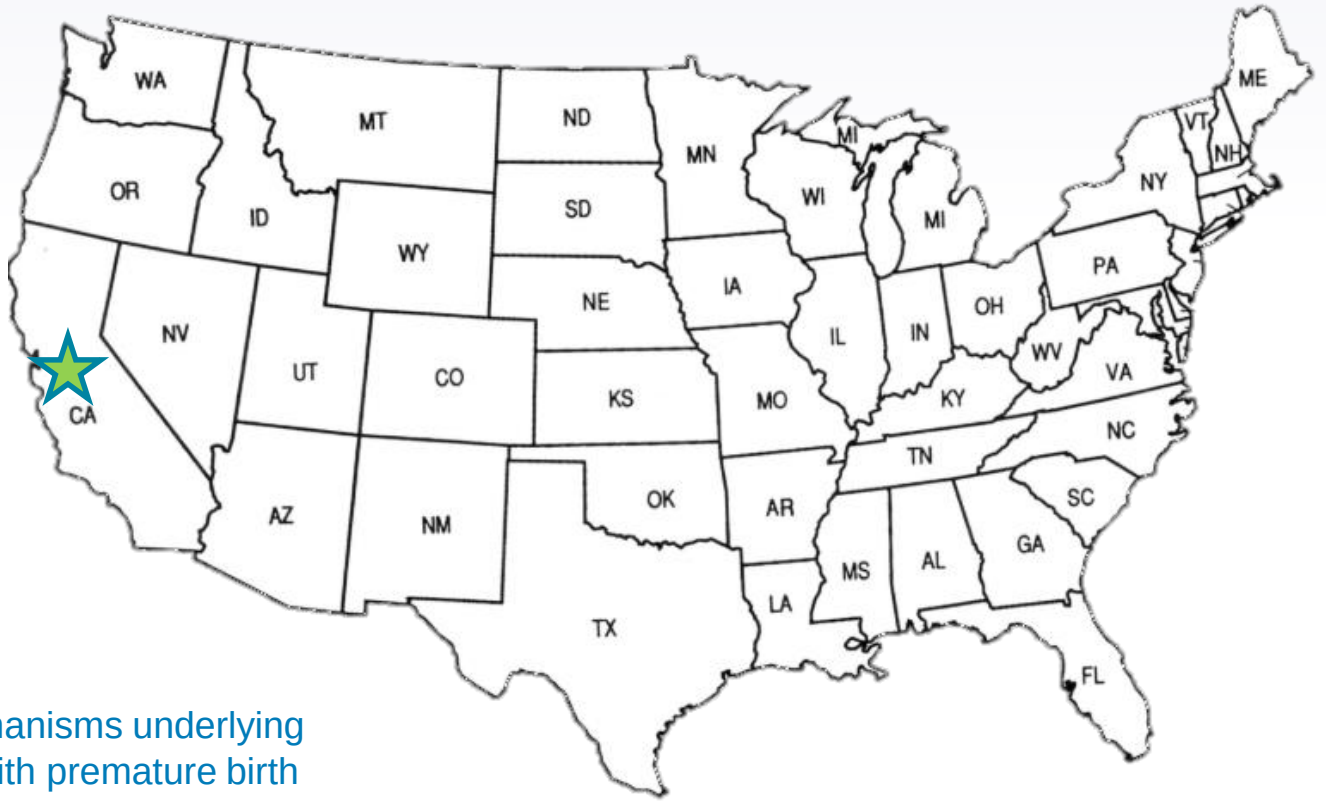
Where are they now?

Pediatric Scientist Development Program

PSDP alumni serve academic missions throughout the US and Canada

Where are they now?

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



Research: Understanding molecular mechanisms underlying neurodevelopmental disorders associated with premature birth

PSDP alumni serve academic missions throughout the US and Canada

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

Pediatric Scientist Development Program

Association of Medical School Pediatric Department Chairs • AMSPDC

PSDP alumni serve academic missions throughout the US and Canada

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

PSDP alumni serve academic missions throughout the US and Canada

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

PSDP alumni serve academic missions throughout the US and Canada

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.

PSDP alumni serve academic missions throughout the US and Canada

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

PSDP alumni serve academic missions throughout the US and Canada

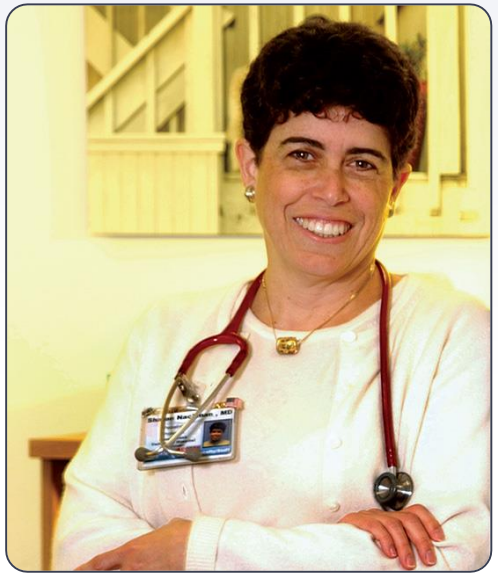
Where are they now?

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.

PSDP alumni serve academic missions throughout the US and Canada

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

Sharon Nachman, MD (1989)

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

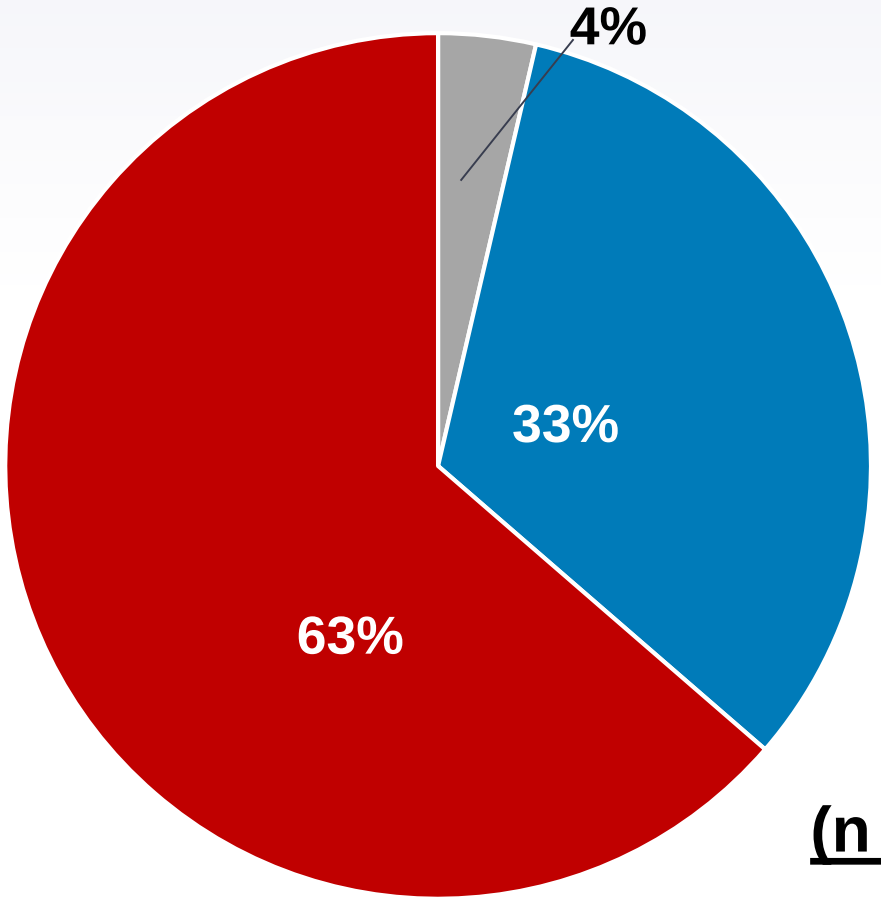
- PSDP branding & communication
- Increase number and quality of applicants
- Maintain and expand PSDP support

Increasing number and quality of applicants: Department Chair Physician-Scientist Survey 2019

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

96% of Respondents Are Concerned About the Decline in Pediatrician-Scientists



(n = 66 responders)

Department Chair Physician-Scientist Survey

Barriers to nomination to PSDP

PSDP Branding & Communications

- **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**

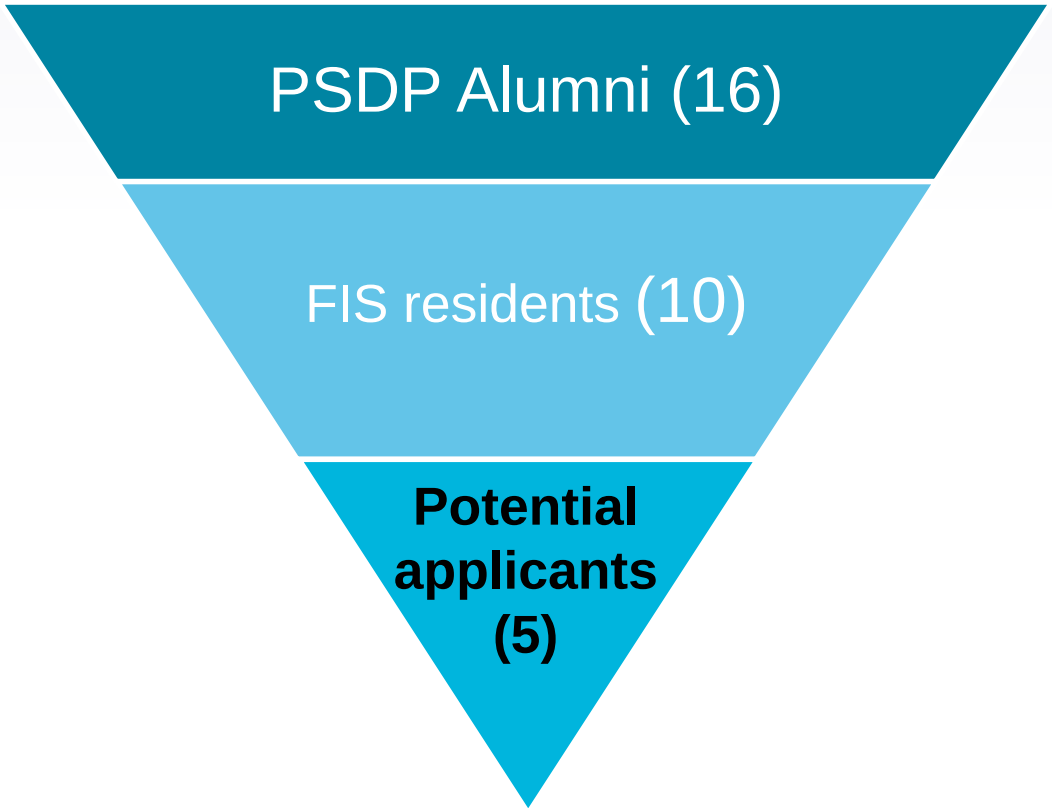
- **Website:** https://amspdc-psdp.org/
- **Social media (Twitter)**: @PSDP_AMSPDC

New Logo:

- **Build PSDP alumni network**

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



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**

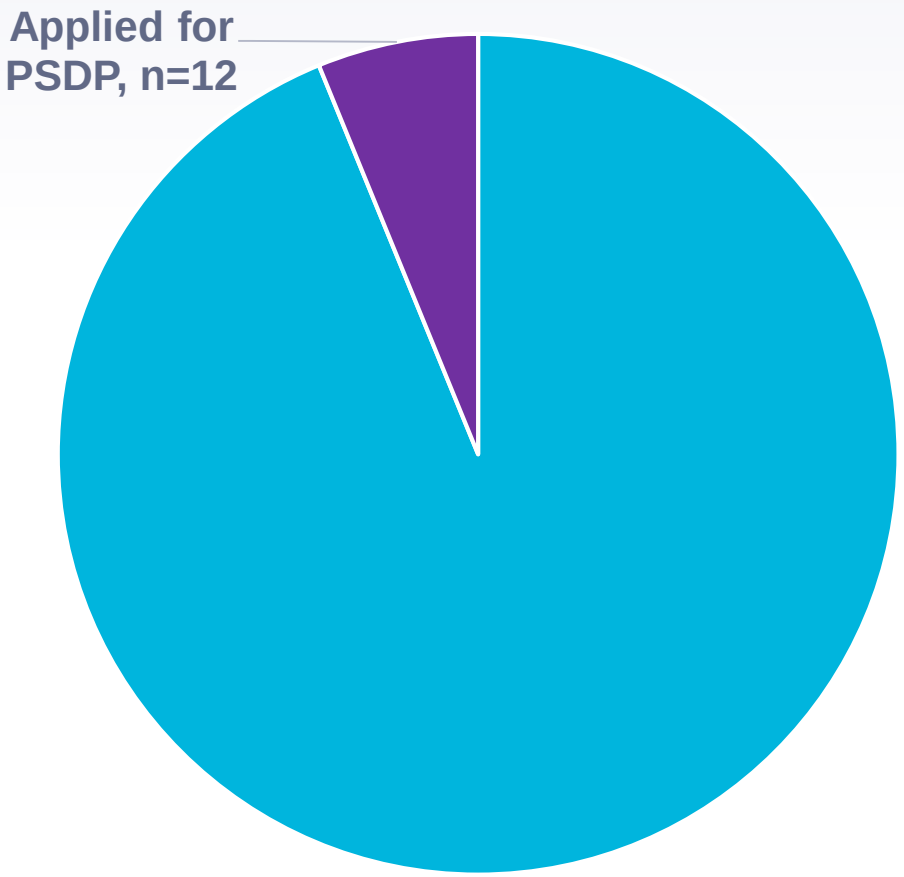
Increasing number and quality of PSDP applicants: FIS Pipeline

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

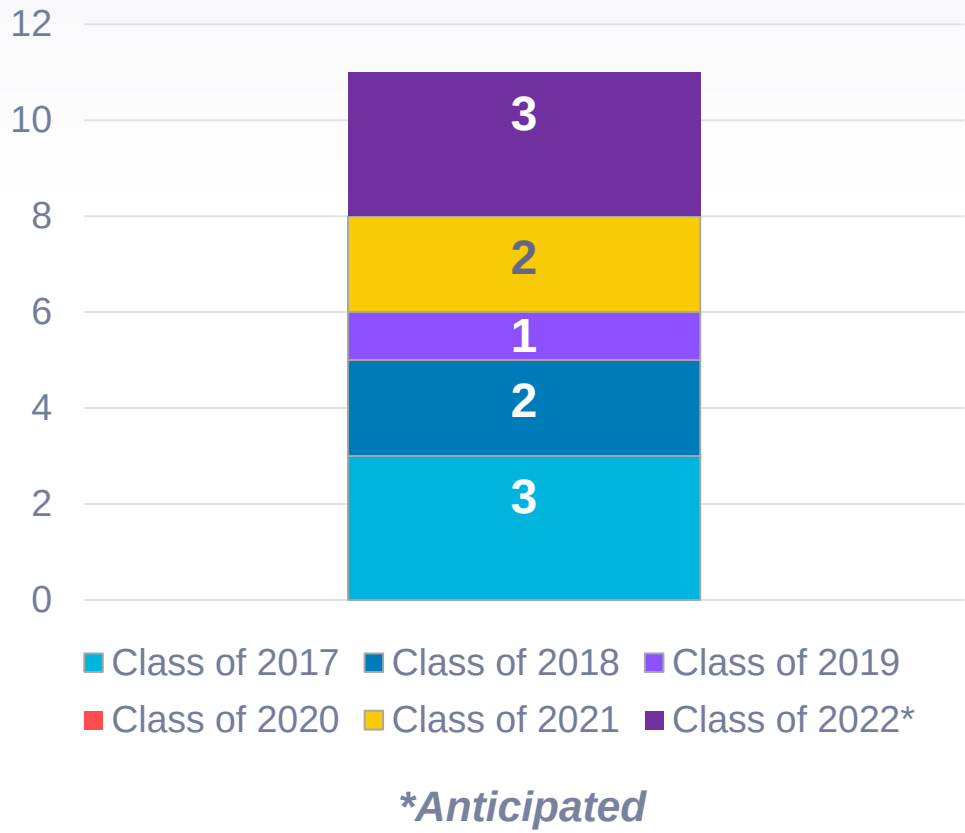
- **Interventions**
  - **Provide FIS residents with PSDP alumni mentor**
  - **Direct emails to 2018-2019 FIS residents with PSDP application information**
  - **Presentation at Assoc of Pediatric Program Directors (APPD)**
  - **Target geographic locations where applicant pool is low**

PSDP -> FIS Pipeline

FIS Residents, 2015—2019



FIS Residents Entering PSDP



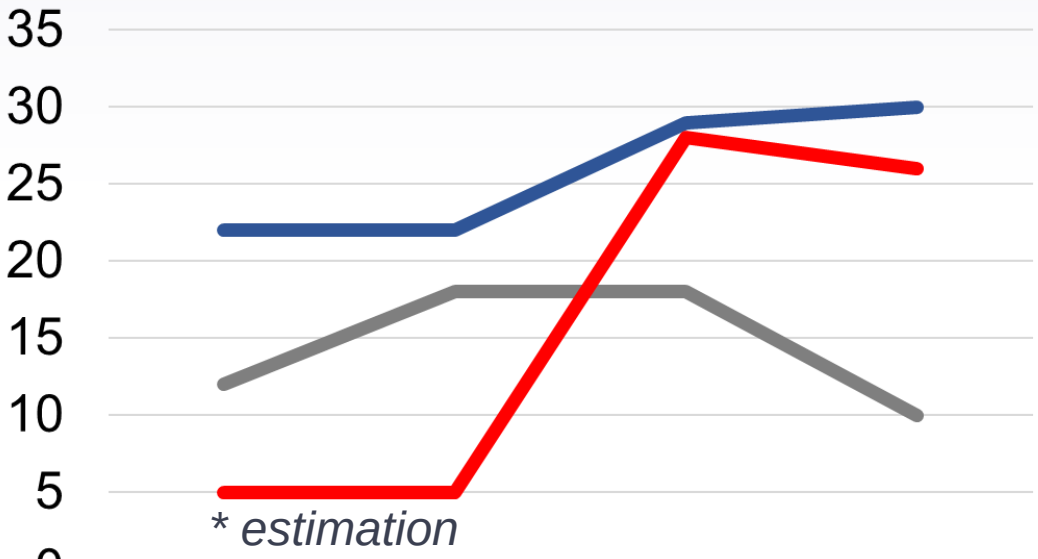
**Anticipated*

FIS-PSDP Pipeline

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.*



** estimation*

	2016	2017	2018	2019
# Female	22	22	29	30
# Male	12	18	18	10
#URM	* 5	* 5	28	26

- **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**

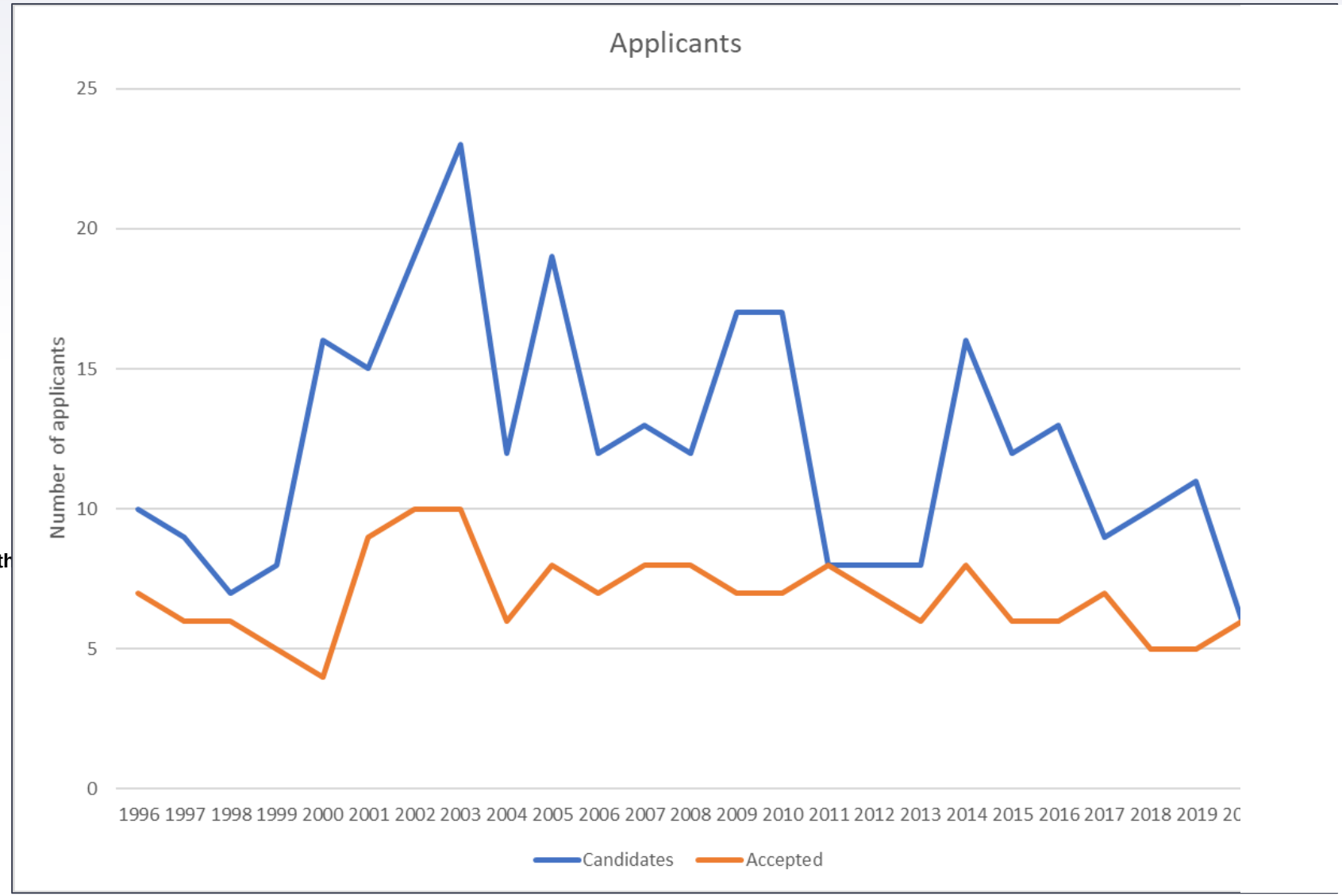
Increasing applicant numbers

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



Increase Applicant Geographic Diversity

Candidates for 2021 cohort (18)

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**

Pediatric Scientist Development Program

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

Pediatric Scientist Development Program

Thank you to our

PSDP Steering Committee

Questions?

Sallie Permar, PSDP Director:
sallie.permar@duke.edu

Michelle Cooley, PSDP Coordinator:
michelle.cooley@duke.edu

AMSPDC and Chair support is critical to this program

Thank you!

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