

# *Guidelines for the Development of Department-level Physician-Scientist Training Programs (PSTP) at Duke School of Medicine*

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## Executive Summary

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### Purpose:

To provide guidance on establishing a department-level program to support residents and fellows in conducting scientific research and in establishing themselves on an academic career path.

### Key points:

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- Identify trainees within your residency and/or fellowship programs who are interested in a research career
- Programs should be led by faculty who are established physician-scientists with active research portfolios
- Consider designating a funded physician-scientist as part of the residency program leadership (Assistant Program Director of Physician Scientist Development)
- Pursue PI status for senior trainees applying for funding
- Consider a non-faculty Program Manager (typically MS/PhD-level) to provide support for program operations and metrics
- Provide support for mentor identification, oversight of scholarly activities, and training in scientific communication and grant writing
- Evaluate specialty-specific training needs that can be supported by your department-level program
- Consider a separate residency track for research-oriented residents, which provides protected time to conduct research
- Refer research-oriented trainees to the School of Medicine [Office of Physician-Scientist Development](#) programming: [Research Careers Ahead!](#) Seminar Series; [Basic Research Training Program](#) (which will eventually become a certificate/master's program along side the CRTP), OPSD Scholars SOM-wide mentor identification and career mentoring program

## Overview

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Physician-scientists (also referred to as clinician-investigators) are individuals who hold medical degrees and spend a significant portion of their professional time conducting scientific research. Due to their unique perspective, which combines scientific inquiry with experiences derived from direct patient care, physician-scientists have the capacity to translate findings from a variety of disciplines into new patient treatment strategies, leading to improved health outcomes. Thus, physician-scientists are critical to the biomedical workforce and continued advances in human health and well-being.

Mentoring and exposure to research during clinical training remain important factors in the decision to pursue a physician-scientist career pathway, and are potentially among the most challenging factors to address in helping to grow the physician-scientist pipeline. Herein, we provide guidelines for developing department-level physician-scientist training programs (PSTPs) to help fill these gaps.

## Duke Office of Physician-Scientist Development (OPSD)

### PSTP goals

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The overall goal of a department-level PSTP is to identify and train the next generation of physician-scientists. To this end, each program should provide support for mentor identification, scholarship oversight committees, individual development plans, and resources for conducting research.

### Program Operations

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#### Programming Overview

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A PSTP program provides resources needed for trainees to have successful research experiences during their clinical training, including appropriate mentors, clear expectations for scholarly productivity, and training to gain knowledge and skills to conduct research and navigate the physician-scientist career path. PSTPs should cover the range of basic, translational, and clinical research important to your field or therapeutic area.

#### Program Administration

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- Departmental Faculty PSTP Leadership
  - PSTPs within a departmental residency or fellowship program should be led by physician-scientists with active research portfolios—ideally, including co-directors or assistant directors focused on basic/translational research and another who is focused on clinical research.
  - Additional faculty support for trainees can be provided by experienced physician-scientists within the Department (“super mentors”). Super mentors commit to serving on scholarship oversight committees, assisting with recruitment efforts, and advising trainees at all points along the research path.
- Departmental Operational Leadership
  - A staff program manager (typically MS/PhD) with experience in both program management and academic research should be identified to manage the operational logistics of the PSTP program.
- Departmental Educational Leadership
  - We strongly recommend establishing a position for a physician-scientist among the departmental education leadership. To support program success, it is important to identify someone who can meet regularly with the residency program leadership to help ensure that the interests of both the clinical and research training programs are represented in all decision-making settings. Identifying and discussing potential conflicts and scheduling challenges early can help programs and trainees avoid unnecessary frustration.

#### Recruitment/Application processes

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Potential PSTP applicants can be selected through both internal and external recruitment events that begin even before the initiation of residency. Potential internal recruitment venues include:

- Duke Medical School Third Year Research Program
- Informational sessions with Duke medical student interest groups
- Duke Medical Scientist Training Program

External recruitment of residents through the National Resident Matching Program can be coordinated with the departmental Residency Program selection committee. When possible, hosting Resident Research Scholars Interview Days can provide opportunities to interview applicants who have research experience and express interest in physician-scientist careers. A half-day program on the day prior or following the traditional interview day can allow applicants to meet with potential research mentors and learn about the departmental and institutional resources for physician-scientist development.

## Duke Office of Physician-Scientist Development (OPSD)

It may be desirable to open the Departmental PSTP to all incoming residents and fellows who are interested in a research career. The application should be accessible to all who are interested in pursuing research. For example, it can consist of an NIH-style biosketch and a one-page personal statement detailing the applicant's prior research experience, current research interests, and motivation for a career as a physician-scientist. These applications should be reviewed by program leadership and scored on research experience, scholarly output, and commitment to a research-oriented career. Specific consideration may be given to applicants who self-identify as underrepresented in medicine and/or research.

### Mentor identification

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Training a new physician-scientist requires a team effort that combines the expertise of multiple experienced clinicians and investigators to address the multifaceted aspects of pursuing a physician-scientist career. We suggest that program leaders meet with each trainee initially to discuss:

- Immediate and long-term research goals;
- Program expectations and deliverables, such as manuscripts, funding applications, and presentations;
- Current mentoring and research arrangements;
- Potential mentors and laboratory or other research homes;
- Additional resources needed to further their research and career goals; and
- Strategies for integrating scholarly activities and clinical responsibilities.

After meetings with potential mentors, trainees should work with the Program Manager to determine next steps. This iterative process of mentor identification helps trainees identify mentors based on fit rather than reputation or position, which enhances the research training experience and promotes scholarly productivity.

The Program Manager should continue to work closely with each trainee to develop and review their individual development plans (IDPs; see below) and monitor ongoing progress to address any research challenges they are facing. Regular communication with the Program Manager builds trust and makes it easier to identify and address any challenges that impede scholars' abilities to achieve their goals.

Please note that research-oriented clinical trainees are eligible for the OPSD Scholars concierge mentoring program. Participants undergo a competitive selection and RFAs for the program are open on a rolling basis.

### Individual Development Plans

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Each scholar discusses their current arrangements and future needs, including but not limited to identifying: potential mentors, laboratories (as applicable), other resources they will utilize to further their research and career goals, and strategies for integrating scholarly activities and clinical responsibilities, all of which are documented in an individualized development plan (IDP) and reviewed regularly by scholarship oversight committees.

### Scholarship oversight committees

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Each PSTP trainee meets regularly with a scholarship oversight committee (SOC) including,

- the scholar's primary research mentor;
- a clinical mentor from a subspecialty that the scholar is interested in pursuing; and
- 1-2 additional mentors with expertise related to the scholar's research interest (from an identified "Super Mentor" pool).

For residents, the SOC should be developed in consultation with PSTP leadership; SOCs for fellows should be developed by the relevant subspecialty training program. Once established, each SOC should meet with the scholar and PSTP leadership approximately twice per academic year to monitor progress, identify areas of need, and address strategies around research challenges. Progress and training plans should be documented in each trainee's IDP.

## Duke Office of Physician-Scientist Development (OPSD)

### Scholarship milestones

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Each trainee is expected to work on scholarly products throughout their time in the program. Clear timelines help them focus on achievable endpoints and can be designed to accommodate individual research interests and projects. Scholars should be expected to achieve several research milestones in service of their long-term career goals, including abstracts, manuscripts, case reports, funding applications, and scientific presentations; each programming component should be designed to help scholars achieve these milestones.

Senior trainees should be encouraged to pursue research funding opportunities. This includes applying for PI status through the [Duke Office of Research Administration PI status request form](#).

### Seminars/curriculum

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The major goals of the seminar series are to provide the trainees with formalized didactics and professional development to enhance progress toward a research career and to help them network with established physician-scientist investigators. We recommend having trainees attend the **OPSD Research Careers Ahead!** and **Basic Research Training Program series**. For some trainees, it may also be of interest to engage in a Masters or certificate program designed to teach research skills. Some currently available options are the Clinical Research Training Program (CRTP) for clinical researchers, the Masters in Management of Clinical Informatics (MMCI), and in 2020, the Basic Research Training Program (BRTP), an MHS for discovery scientists. Field-specific seminars can be offered by individual training programs.

### Writing support

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Trainees should receive one-on-one assistance from program leadership in preparing grant proposals, fellowship applications, abstracts, and manuscripts. Such support can be provided by the Program Manager and Super Mentors, in addition to SOC members

### Other support and program resources

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When possible, it is desirable to provide support for professional development and equipment that facilitates research productivity, including funds for travel, publication fees, software licenses, and a laptop computer. Scholars should be encouraged to attend local and national meetings to present their work, and funding for these opportunities can help ensure they are able to do so.

### Program metrics

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It is important to identify key performance indicators at the outset of program development in order to establish accurate tracking mechanisms. Measures of scholarly productivity are important to track, including but not limited to:

- conference abstracts and any associated awards earned,
- publications (especially peer-reviewed manuscripts)
- grants and fellowship awards
- professional appointments and awards attained by program graduates

We encourage department-level PSTPs to maintain a database of these metrics to assist in development of training program funding applications.

## Duke Office of Physician-Scientist Development (OPSD)

### Related Programs and Resources

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#### Research-Integrated Pathways

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Some national medical specialty boards have approved research-integrated training pathways and we encourage residency and fellowship programs to make such programs available to their trainees. Additionally, the NIH recently developed the Stimulating Access to Research in Residency (StARR/R38) training program funding opportunity, which allows residency programs to develop programs to incorporate 12-24 months of protected research time. The Departments of Medicine, Pediatrics, and Surgery currently hold R38 awards from the National Heart, Lung, and Blood Institute, and the National Institute of Allergy and Infectious Diseases.

#### Duke School of Medicine Resources

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There are a number of programs offered throughout the School of Medicine that provide complementary programming and services, coordinated by the [Office of Physician-Scientist Development](#):

- OPSD Scholars and concierge mentoring program
- Physician-Scientist Funding Program
- Integrated Research Training Pathways
- Physician-Scientist Training Program
  - Research Careers Ahead! Career Development Seminar Series
  - Basic Research Training Curriculum