

## Psychiatry Residency + PhD Track

### Program Approach and Content

The Department of Psychiatry at Mount Sinai has been awarded NIMH support for this extraordinary and groundbreaking program—unique in the nation—offering a **2<sup>nd</sup> path to MD/PhD training** for up to 2 residents per year. Designed for residents ready to commit to both psychiatry and research, the “PhD+” program longitudinally integrates clinical and research training over 7 years. It also offers the possibility of substantial financial advantages through **NIH’s Loan Repayment Program (up to \$35,000 per year for up to 6 years)**.

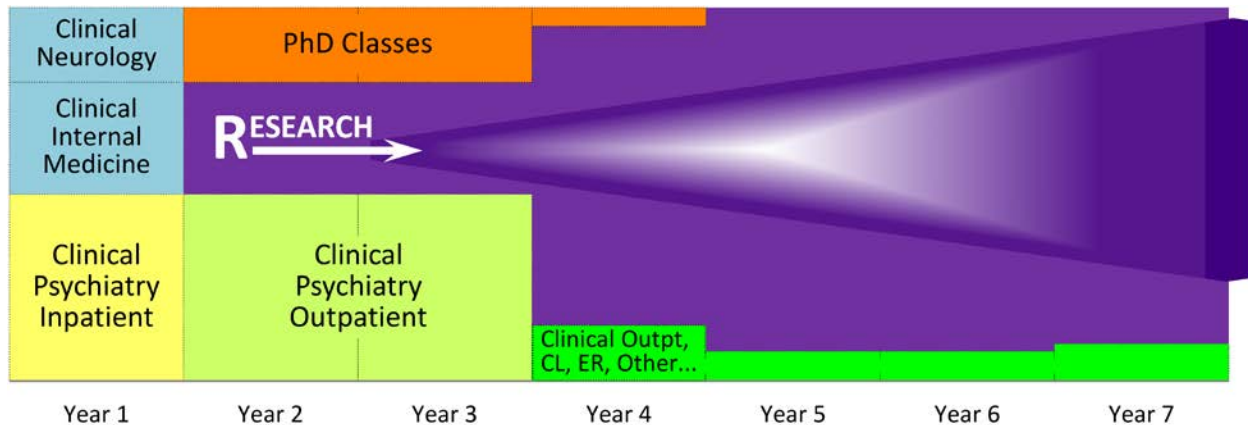
As the fields of neuroscience and genetics have advanced in knowledge base and research strategies and techniques, PhD-level training may be a necessity for both effective translational research and obtaining research funding. Unfortunately, the number of psychiatrist MD/PhD researchers is small. Additionally, while the NIH has long supported Medical Scientist Training Programs, the established method of combined MD/PhD training is inefficient, in that the period of intense research and PhD completion is followed by many years of clinical training, meaning a long separation from research, a decline in research skills, a distance from the knowledge base and collaborators, and a need to retrain after residency.

Our PhD+ track participates as **Residency + PhD (1490400C3)** in the offerings of the Icahn School of Medicine at Mount Sinai’s Psychiatry Residency Training Program, so that applicants may enter the program via the NRMP as PGY-1s. **Current PGY-1s may also transfer into this track, from within our residency or from elsewhere.**

#### The PhD+ program consists of 5 components:

- 1) Completion of all clinical rotations/experiences required for Board Certification by the American Board of Psychiatry and Neurology; attendance at core didactics of the Residency Program.
- 2) Completion of all coursework, examinations, research activities and thesis requirements of the Graduate School of Biomedical Sciences at the Icahn School of Medicine at Mount Sinai for the PhD degree in Neuroscience, Biomedical Sciences (Genetics and Genomics), or Clinical Research (Clinical Trials, Outcomes Implementation, Bench to Bedside and Molecular Epidemiology tracks).
- 3) Dual mentorship, with true integration of PhD work with one’s clinical psychiatry training, including protected time for PhD thesis research while maintaining one’s clinical skills
- 4) A program customized to one’s personal career goals, with flexible adjustment of experiences and objectives over the course of one’s training, including close mentorship, training in research and grant writing, scientific career-building activities (presenting at meetings; joining professional organizations), and connecting with other scientists (including those in our Physician-Scientist Track, other doctoral candidates, and other neuroscientists at Mount Sinai and beyond).
- 5) A supportive community of fellow clinicians and physician-scholars within the Mount Sinai Health System, the largest health care provider in New York City

## Yearly Structure



### Total Research, Clinical, & Didactic Activities over 7 Years

Clinical experiences are front-loaded and continue throughout the 7 years. PGY-1 is a full intern year devoted to meeting residency requirements in Primary Care, Neurology, and Inpatient Psychiatry. For each of the following 6 years, 50% is hospital-supported “residency time” and 50% is NIMH-supported “PhD time.” The residency time includes core clinical training, core residency didactics, and research electives; the PhD time is used for PhD didactics and research. Total research-related time is 55 months (4.6 years) and is appropriate for completing a PhD. PhD+ Residents attend core didactics with residency classmates in Years 1-3; they do not attend in year 4 and beyond, unless they wish to.

| Training Year | Effective Research Time** | Residency Time*                                 | Residency Activities                                | NIMH Time                   | NIMH-Supported Activities             |
|---------------|---------------------------|---|---|-----------------------------|---------------------------------------|
| 1             | 0%                        | 100%  | Internship, including 6 months Inpatient Psychiatry | 0%                          | 0%                                    |
| 2             | 30%                       | 50%   | Outpatient Psychiatry                               | 50%                         | PhD Didactics (20%)<br>Research (30%) |
| 3             | 30%                       | 50%   | Outpatient Psychiatry                               | 50%                         | PhD Didactics (20%)<br>Research (30%) |
| 4             | 80%                       | 50%   | Clinical (15%)***<br>Research Elective (35%)        | 50%                         | PhD Didactics (5%)<br>Research (45%)  |
| 5             | 92%                       | 50%   | Clinical (8%)***<br>Research Elective (42%)         | 50%                         | Research                              |
| 6             | 92%                       | 50%   | Clinical (8%)***<br>Research Elective (42%)         | 50%                         | Research                              |
| 7             | 90%                       | 50%   | Clinical (10%)***<br>Research Elective (40%)        | 50%                         | Research                              |
| Totals        | 55 months                 | 48 months supported by The Mount Sinai Hospital |   | 36 months supported by NIMH |                                       |

\* Residency Time is time spent on clinical rotations, residency didactics, and research electives, spread over 7

years, all paid by the hospital as with any other psychiatry resident.

- \*\* *Effective Research Time* combines the research elective time under Residency Time with the research time provided by NIMH support. The elective research time coming from residency assignments adds up to 19 months. The total amount of research-related time adds the 36 months of NIMH-supported time (6 months x 6 years) to the 19, and arrives at 55 months (4.6 years) of Effective Research Time. In this way, the NIMH support and the elective residency research leverage each other to provide the time that would be considered appropriate for completing a PhD.
- \*\*\* *Clinical* refers to Consultation-Liaison, Child and Adolescent, Outpatient, Community, Emergency, and Forensic Psychiatry (see text).

## Clinical & Elective Research Assignments during “Residency Time”

### Year 1: (counting for 12 months of residency training)

- 4 months of primary care
- 2 months of neurology
- 6 months of inpatient psychiatry, including 1 month child/adolescent

### Year 2: (counting for 6 months of residency training)

- 6 months of adult outpatient psychiatry  
(done as 50% time over 12 months)

### Year 3: (counting for 6 months of residency training)

- 6 months of outpatient psychiatry  
(done as 50% time over 12 months, with 40% adult and 10% (0.6 months) child/adolescent)

### Year 4: (counting for 6 months of residency training)

- 1.8 months of outpatient psychiatry  
(done as 15% time over 12 months, with 10% adult, and 5% child/adolescent)
- 4.2 months of research time

### Year 5: (counting for 6 months of residency training)

- 1 month of consultation-liaison psychiatry (done as a block rotation)
- 5 months of research time

### Year 6: (counting for 6 months of residency training)

- 1 month of consultation-liaison psychiatry (done as a block rotation)
- 5 months of research time

### Year 7: (counting for 6 months of residency training)

- 1.2 months of community, emergency, and forensic psychiatry  
(done as 10% time over 12 months)
- 4.8 months of research time

## PhD Didactics and Thesis

The Graduate School of Biomedical Sciences at the Icahn School of Medicine at Mount Sinai has 9 defined Multidisciplinary Training Areas, each with its own curriculum and leaders, including Neuroscience with 53 current PhD students, Genetic & Genomic Sciences with 18 current PhD students, and the PhD Program in Clinical Research with 23 current PhD students.

The graduate school didactic component of our PhD+ program will begin in Year 2 and continue in Years 3 and 4, on a part-time basis, along with the half-time residency activities described above. The PhD coursework required in this program is similar to that required of current MD/PhD candidates at Mount Sinai.

Of the 72 credits required for the Neuroscience and Biomedical Sciences (Genetics and Genomics) PhD, **20-28 credits may be awarded for prior Medical School coursework and research**. Also, 6 credits are awarded for each semester of independent research while pursuing the PhD.

Of the 66 credits required for the Clinical Research PhD, up to **12 credits can be transferred from prior coursework**.

### Structure of the PhD in Neuroscience and Biomedical Sciences (Genetics and Genomics)

#### Three “Core Courses” are taken sequentially in Year 2

Each has embedded Journal Clubs in addition to weekly didactics. Course Credits are in parentheses.

##### Neuroscience Core Courses:

- Systems Neuroscience (4)
- Cellular and Molecular Neuroscience (4)
- Neural Basis of Behavioral Plasticity and Cognitive Processes (4)

##### Genetics/Genomic Core Courses:

- Biomedical Sciences 1 (6)
- Biomedical Sciences 2 (6)

#### Years 3 and 4 students choose from advanced courses, departmental seminars, and journal clubs.

##### Neuroscience Advanced Courses:

- Cognitive Neuroscience Advanced Topics (1)
- Brain Imaging: In Vivo Methods (1)
- Neuropharmacology (1)
- Neurodegeneration (2)
- Neuroanatomy (3)
- Molecular Pathogenesis of Neurological & Psychiatric Disorders (3)
- Advanced Topics in Synapses (1)
- Molecular Pathways of Metabolic Disease (2)
- Topics in Clinical Neuroscience (1)
- Neurobiology of Aging & Adult Development (3)

##### Genetics and Genomics Advanced Courses:

- Translational Genomics (2)
- Statistical Genetics (2)
- Intro to Human Genome Sequencing (2)
- Psychiatric Genomics (2)
- Advanced Topics in Human Genetics (3)

##### Other required courses:

- Responsible Conduct of Research, year 2 or 3 (1)
- Biostatistics, year 2 or 3 (3)
- Systems Approach to Genetic Basis of Disease (3)

Additionally, students receive instruction in scientific writing and attend grant proposal writing workshops. For example, there is a “Specific Aims” workshop two months before the thesis proposal time period so that students learn how to write and critique in preparation of their thesis proposals. There is also an oral presentation skills workshop on how to effectively present a PowerPoint presentation.

The Program has given much thought to the PhD thesis. In obtaining research funding, journal publications are given substantial weight. The Mount Sinai Graduate Program allows trainees to combine 3 publications into a thesis, with the addition of an introduction chapter and a discussion chapter. It is this plan which we consider most appropriate for trainees in this Program, and thus trainees will be encouraged to publish their research results early in the training schedule.

## Structure of the PhD in Clinical Research

Year 1 and 2 students complete the core course requirements for the specific track. Course Credits are in parentheses.

### Bench to Bedside Track Core Course Requirements

#### Year 1

- MPH0800 Introduction to Advanced Biostatistics (3)
- CLR0006 Spectrum of Methods in Clinical Research I (3)
- BIO6500 Probability and Inference I (3)
- MPH0812 Applied Linear Models I (3)
- CLR0700 Professionalism & Ethical Issues in Clinical Research (2)
- CLR0016 Spectrum of Methods in Clinical Research II (3)
- MPH0822 Applied Linear Models II (3)
- CLR0501 Computational Tools for Clinical Research (3)
- CLR0007 Spectrum of Methods in Clinical Research III (3)
- CLR0011 Grant Writing (1)

#### Year 2

- CLR0017 Clinical & Translational Research Journal Club & Seminar Series (full year course) (1)
- CLR0012 Integrative Problem Solving in Clinical and Translational Research (full year course) (1)
- CLR0018 Clinical & Translational Research Journal Club & Seminar Series (full year course) (1)
- CLR0014 Integrative Problem Solving in Clinical and Translational Research (full year course) (1)
- CLR0320 Applied Biostatistics in Clinical Trials (3)
- CLR0901 The Drug Development Process (1)
- CLR0019 Clinical & Translational Research Journal Club & Seminar Series (full year course)
- DOCTORAL THESIS & ELECTIVES (Total 30)
  - Doctoral Thesis-CLR0020 (minimum 27 credits)

### Clinical Trials Track Core Course Requirements

#### Year 1

- MPH0800 Introduction to Advanced Biostatistics (3)
- CLR0006 Spectrum of Methods in Clinical Research I (3)
- BIO6500 Probability and Inference I (3)
- MPH0812 Applied Linear Models I (3)
- CLR0016 Spectrum of Methods in Clinical Research II (3)
- CLR0700 Professionalism & Ethical Issues in Clinical Research (2)

MPH0822 Applied Linear Models II (3)  
CLR0501 Computational Tools for Clinical Research (3)  
CLR0007 Spectrum of Methods in Clinical Research III (3)  
CLR0011 Grant Writing (1)

**Year 2**

CLR1010 Clinical Trials Management (1)  
CLR0017 Clinical & Translational Research Journal Club & Seminar Series (full year course) (1)  
CLR0012 Integrative Problem Solving in Clinical and Translational Research (full year course) (1)  
CLR0320 Applied Biostatistics in Clinical Trials (3)  
CLR0018 Clinical & Translational Research Journal Club & Seminar Series (full year course) (1)  
CLR0014 Integrative Problem Solving in Clinical and Translational Research (full year course) (1)  
CLR0901 The Drug Development Process (1)  
MPH0624 Outcomes Research Methods (3)  
CLR0019 Clinical & Translational Research Journal Club & Seminar Series (full year course) (1)  
DOCTORAL THESIS & ELECTIVES (Total 26)  
    Doctoral Thesis-CLR0020 (23 credits)

## Trainee Stipends

PGY-1 trainees are full-time Mount Sinai Hospital interns and paid accordingly. They are also eligible for Mount Sinai housing, and are eligible to receive support for travel to scientific meetings and any costs related to research activities.

In years 2 through 7, trainees will be paid by both The Mount Sinai Hospital for their work as 50% time resident psychiatrists and via NIMH and Department of Psychiatry funding. The salary is at least equal to that of residents having a similar number of years after graduation from medical school (i.e., the postgraduate year or “PGY”-level). Additional sources of support for successful trainees in the Residency + PhD program may also be available, both for research activities and for salary.