



HARVARD
MEDICAL SCHOOL

MASTER OF MEDICAL SCIENCES IN CLINICAL INVESTIGATION



Developing leaders in clinical and
translational research



FAST FACTS

- A two-year mentored research experience at a Harvard-affiliated laboratory
- Renowned research faculty from Harvard Medical School, Harvard T.H. Chan School of Public Health, and Harvard-affiliated hospitals and research institutions
- Students gain practical experience with statistical programming, individual research projects and scientific writing
- Contemporary pedagogical approaches such as “flipped classroom” methods, team-based learning and development of critical thinking skills
- Specialized tracks and pathways for individualized learning
- An experienced biostatistician works directly with students to provide support and help them achieve their academic and research goals



Message from the Program Director

Harvard Medical School's Master of Medical Sciences in Clinical Investigation (MMSCI) is a two-year degree program specifically targeted to develop future world leaders in patient-oriented and translational research. The provision of outstanding training in clinical and translational research and laboratory methodology is essential for the future success and development of biomedical sciences and related fields. The MMSCI curriculum embodies this goal by incorporating training in core subjects—such as epidemiology and biostatistics; implementation science and clinical trials; and translational methods such as genetics, immunology and systems biology—with an innovative skills-based approach to modern pedagogy.

The primary mission of the program, in keeping with the mission of HMS, is to play a key role in the training and development of the best and brightest students from all corners of the globe. The matriculation of students with an MMSCI degree from HMS represents a key milestone for each student, as well as the beginning of an exciting and productive career as a physician-scientist, clinical-scholar or biomedical researcher.

I encourage you to participate in this innovative and prestigious program.

A white, handwritten signature on a dark blue background. The signature is stylized and appears to be 'Ajay K. Singh'.

Ajay K. Singh, MBBS, FRCP (UK), MBA

Senior Associate Dean

Postgraduate Medical Education

MMSCI Program Director

Harvard Medical School

ajay_singh@hms.harvard.edu



MASTER OF MEDICAL SCIENCES IN CLINICAL INVESTIGATION (MMSCI)

Leading discoveries that will change the course of health care in the world

Major medical advances don't occur by accident. The journey from bench to bedside is fraught with challenges, requiring specific skills and extensive experience. Those interested in leading clinical and translational investigative efforts in an environment where funding is scarce, needs are urgent and competition is fierce will gain those skills and experience in Harvard Medical School's Master of Medical Sciences in Clinical Investigation program. This two-year course of study features a parallel research experience in which students work with a Harvard faculty mentor in a Harvard-affiliated research group.

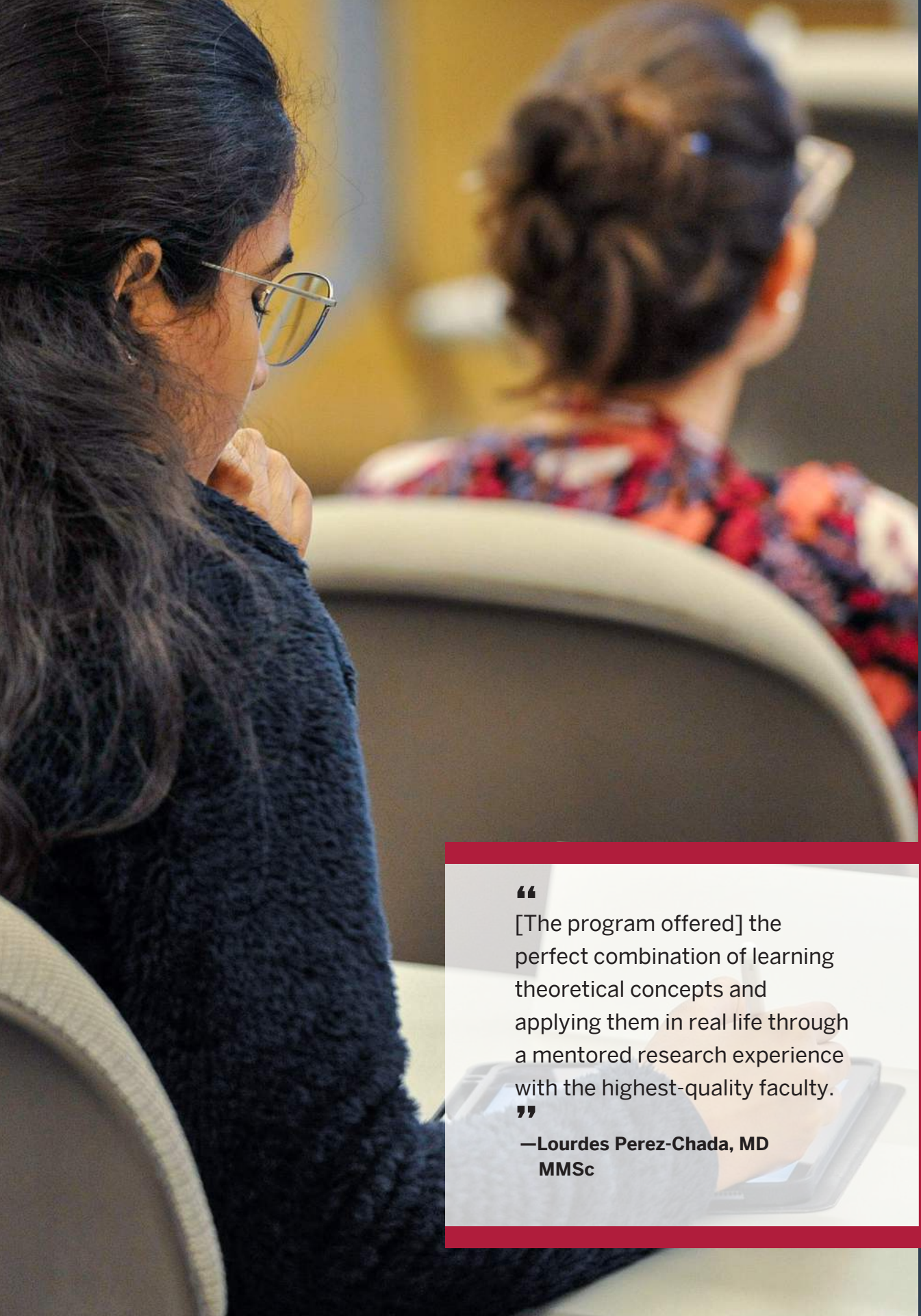
The MMSCI program is designed for professionals holding an MD, PhD, MBBS, MBBCh or comparable degree currently working in clinical or translational research. Candidates from all over the world apply to this highly selective program; in fact, MMSCI admits students from within and outside of the U.S., enriching our program with their varied perspectives and experiences. Upon graduating from this program, career options include: progression to independent investigators, directors of research, chief medical officers, or leaders in academic research as Independent Principal Investigators.

Our program offers two customized learning tracks: a Clinical Investigation track and a Translational Investigation track. We offer additional choices with Comparative Research and Clinical Trials pathways within the Clinical Investigation track and a Drug, Device and Biomarker Investigation pathway within the Translational Investigation track. Across all tracks and pathways, students learn about ethical conduct, how to frame a research question, construct and test hypotheses, implement a study, analyze and interpret data and communicate the results of their study. The concurrent mentored research experience requires the development and presentation of two original first-author manuscripts or an equivalent body of work.



UPON COMPLETION OF THE PROGRAM, YOU'LL BE ABLE TO:

- Construct focused research questions and formulate testable hypotheses
- Design and implement well-designed clinical and translational research studies
- Analyze, interpret and present clinical and translational research data



“

[The program offered] the perfect combination of learning theoretical concepts and applying them in real life through a mentored research experience with the highest-quality faculty.

”

—**Lourdes Perez-Chada, MD**
MMSc

Welcome to the community.

When you enroll in a master's program at Harvard Medical School, you join one of the world's premier learning communities. Harvard University is home to an unbelievable wealth of talent, creativity and curiosity. In the MMSCI program, we strive to build a community of learners and organize various social gatherings throughout the year. We're eager to have you not only benefit from that tradition, but also contribute to it.

LEARN. EXPLORE. APPLY. NETWORK.

You'll study alongside peers with a wide-range of life experiences, belief systems and perspectives as you build the skills to advance your career. To help you make the most of your experience, our faculty and staff advisers—whose ranks include some of the most respected experts in the field—provide close guidance and support every step of the way.

Outside of the classroom, Harvard Medical School and Harvard University host countless events over the course of the year that

provide intellectual, academic and cultural enrichment. Boston and Cambridge are also incredible assets—professionally and personally. Dive into the cultural life of the city or hone your professional practice through interactions with the thousands of leading clinicians and researchers in the area.

After completing your program, you'll continue to benefit from one of the greatest alumni networks in the world. Wherever your path leads, you'll always be part of Harvard's community.

Course of Study

The MMSCI program is designed to stimulate critical thinking and help students develop practical skills, network, and learn new approaches to dealing with uncertainty in patient-oriented research.

To achieve these aims, there is a foundational first year where students from both the Clinical Investigation and Translational Investigation tracks learn together. In the second year, students in each track then customize their learning along their interests. Theory is reinforced and consolidated with case studies and laboratory exercises, while skills are developed and refined with practice-oriented tasks.

“

What drew me to this program was the mentored research experience. [The opportunity] to apply the things that I learned in the classroom to my work in my research lab.

”

—Tarek Nafee, MD
MMSc



Program Tracks

The program provides the choice of a **Clinical Investigation** or a **Translational Investigation** track, promoting collaboration across the spectrum of medical research.

Clinical Investigation (CI) Track

Allows customized learning for students through the pursuit of either a comparative research pathway or a clinical trials pathway. Guided by a dedicated thesis committee, each student completes two first-author manuscripts based on the work from their research projects or an equivalent body of work.

Translational Investigation (TI) Track

For investigators who wish to apply basic science techniques to answer clinically relevant questions. The track incorporates topics such as systems biology, omics analysis and bench techniques and offers further individualized learning with a Drug, Device and Biomarker Investigation pathway. Guided by a dedicated thesis committee, each student completes two first-author manuscripts based on the work from their research projects or an equivalent body of work.

THE CURRICULUM INCLUDES THE FOLLOWING CORE COURSES:

- **Clinical and Translational Investigation Thesis Preparation**
- **Clinical Data Science: Design and Analytics**
- **Leadership and Teamwork**
- **Ethics and Institutional Review Board**
- **Genetic Epidemiology**
- **Mentored Research Experience**

Learning Model

MENTORED RESEARCH EXPERIENCE:

During the two-year program, under the guidance of a primary mentor and dedicated thesis committee, you'll develop and execute research projects in a Harvard-based research group.

INTENSIVE WORKSHOPS: Four intensive workshops and didactic sessions are complemented by journal clubs, office hours, computer laboratory classes, team-based projects and presentations.

LONGITUDINAL TEACHING: Between each workshop, further exploration of contemporary research topics occur at weekly interactive sessions.

SCIENTIFIC COMMUNICATION: A course designed to complement the didactic and longitudinal curriculum through the interpretation and communication of scientific data, as well as the development of research questions and grant proposals.

INDIVIDUALIZED LEARNING: Opportunities for customized learning, including tracks in Clinical Investigation and Translational Investigation, as well as individualized pathways in clinical trials, comparative research.

PROGRAM SPECIFIC BIostatistician: A biostatistician will be assigned to each student. They will help the student to download, clean and prepare datasets for analysis; and help with analysis, interpretation, and presentation research output.

Mentored Research Experience

As a core component of the program, you'll conduct research either at Harvard Medical School or at an HMS-affiliated hospital. Your faculty mentor will help you oversee all aspects of the project. At the end of the research experience, you'll complete a thesis under the direct supervision of a thesis committee. It will include two first-author manuscripts of original research that you submit to a peer-reviewed journal or an extensive document describing the body of work you've completed. You'll also give a public presentation of your work and your thesis will be archived at the Countway Library.

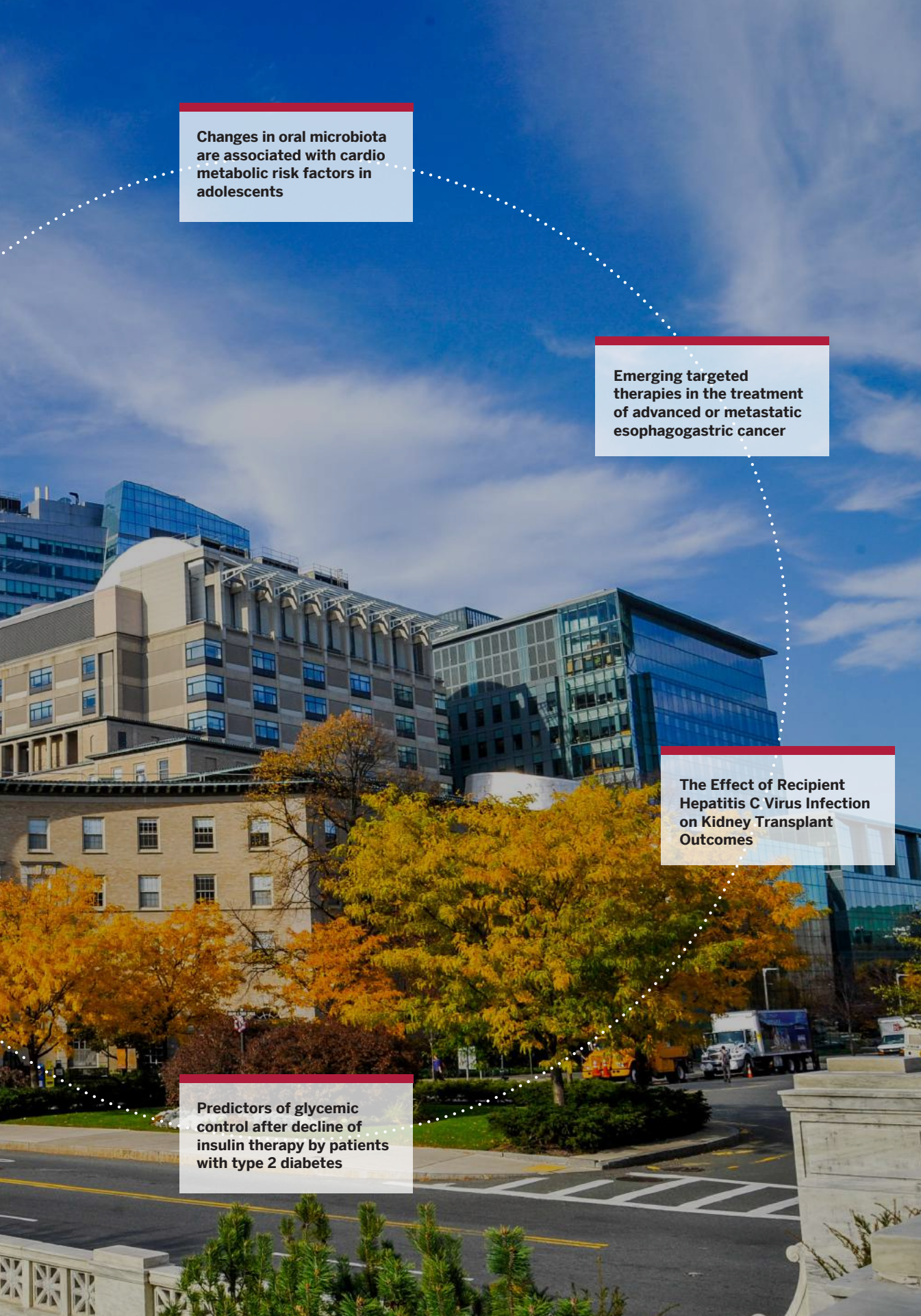
HMS's clinical affiliates and research institutes are vital partners that provide patient care and clinical training. MMSCI students have the opportunity to conduct mentored research at leading institutions including:

- Beth Israel Deaconess Medical Center
- Boston Children's Hospital
- Brigham and Women's Hospital
- Broad Institute
- Cambridge Health Alliance
- Dana-Farber Cancer Institute
- Harvard Pilgrim Health Care Institute
- Hebrew SeniorLife
- Joslin Diabetes Center
- Judge Baker Children's Center
- Massachusetts Eye and Ear | Schepens Eye Research Institute
- Massachusetts General Hospital
- McLean Hospital
- Mount Auburn Hospital
- Ragon Institute of MGH, MIT and Harvard
- Spaulding Rehabilitation Hospital
- VA Boston Healthcare System

Examples of thesis projects include:

Application of machine learning and causal inference approaches to asthma and bronchiolitis research

Machine learning-based prediction of acute severity in infants hospitalized for bronchiolitis



Changes in oral microbiota are associated with cardio metabolic risk factors in adolescents

Emerging targeted therapies in the treatment of advanced or metastatic esophagogastric cancer

The Effect of Recipient Hepatitis C Virus Infection on Kidney Transplant Outcomes

Predictors of glycemic control after decline of insulin therapy by patients with type 2 diabetes

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People often ask me why I got involved in clinical research. For me, it boils down to patient care and how we can improve patient care.

”

—Finnian Mc Causland
Co-Director,
MMSCI Program



Harvard Medical School attracts the best and brightest faculty from all around the world. As a student in the MMSCI program, you'll have access to outstanding teachers and mentors. The program faculty are drawn from Harvard Medical School and the Harvard T.H. Chan School of Public Health, as well as the HMS-affiliated hospitals.



Who Leads the Program?



Ajay K. Singh, MBBS, FRCP, MBA

Program Director

Senior Associate Dean, Postgraduate Medical Education Harvard Medical School



Finnian R. Mc Causland, MBBCh, MMSc, FRCPI

Co-Director

Faculty Director, Postgraduate Medical Education Harvard Medical School



Martina McGrath, MBBCh, FRCPI

Co-Director

Transplant Nephrologist and Medical Director, Live Kidney Donation, Brigham and Women's Hospital Instructor, Harvard Medical School



Rosalyn Adam, PhD

Associate Director

Director, Urology Research, Boston Children's Hospital Associate Professor of Surgery, Harvard Medical School



Lourdes Pérez-Chada, MD, MMSc

Associate Director

Instructor in Dermatology, HMS Clinical Researcher, Dermatology, BWH



Kerri LaRovere, MD, RPNI, MMSc

Assistant Director

Chief, Neurocritical Care Program in Neurology, Program Director, Pediatric Neurocritical Care Fellowship, Neurology Track, Assistant Professor of Neurology, Harvard Medical School



Enid Martinez, MD

Assistant Director

Associate in Critical Care, Boston Children's Hospital, Assistant Professor of Anesthesia, Harvard Medical School



Suman Srinivasa, MD, MS

Assistant Director

Assistant Professor of Medicine, Harvard Medical School



“

Advancing my field through research is something that will be part of my career for as long as I'm alive and working as a doctor.

”

—Omar Abu Qamar, MD
MMSc



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“

This training has been one of the most important journeys in my clinical research career at one of the best medical schools in the world.

”

—Girish Naik, MBBS
MMSc



LEARN MORE AND APPLY

hms.harvard.edu/msci

CONTACT US

4 Blackfan Circle 4th Floor
Boston, MA 02115

EMAIL

mmsci@hms.harvard.edu