

VIROLOGY AND GENE THERAPY (VGT) - POSTDOCTORAL MASTER'S DEGREE

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Application

Candidates must complete a Postdoctoral Master's Degree Application form. This form is available on the MCGSBS Master's Programs intranet site. Supporting documents include a program fee agreement form, transcripts from previous colleges and two letters of recommendation - one preferred from your direct supervisor/manager.

Eligibility

Applicants must be employed at Mayo Clinic. The employment appointment, as documented at the time of application, must be greater in length than the time required for completion of all requirements of the program. Eligible roles include: Mayo Clinic physician, scientist, fellow or resident with a doctoral degree in a discipline applicable to clinical research or medical student who plans to have a research career (except for CTS). Visiting research fellows are eligible. However, visiting clinicians, research trainees and research collaborators are not eligible.

Time Requirement

Applicants must have adequate protected time to complete course and research requirements within designated program length. Applications with inadequate protected time to complete the program will not be accepted. Time to completion can vary by program and Mayo Clinic role from two to five years. All scholars must be in their program a minimum of 1 year in order to meet the MCGSBS residency requirement. Scholars must complete all program requirements within 5 years.

Students must have dedicated time for their program commitments and abide by course attendance requirements as defined in course syllabi. Students must be appropriately engaged in their program and demonstrate continued progress towards graduation.

Registration Requirement

At least 75% of the coursework for the Master's degree must be completed in MCGSBS. It is expected that a minimum of one year will be devoted to research.

Minimum Credit Requirements

Students must complete a minimum of 45 credits, which includes a maximum of 16 Research credits. (See Requirements tab within each track for specific course requirements.)

Transfer Credits

A total of 9 didactic credits may be transferred into the program. For more details, see the Credit Conversion, Transfer, Waiver, and Substitution Policy on the MCGSBS intranet site.

The Postdoctoral Master's degree track in Virology and Gene Therapy has two pathways to choose from:

The **Regulatory/Translational Pathway** student will gain a broad scope of gene therapy and will learn how to develop a gene based therapeutic from an idea to a validated product. Various gene therapy strategies will be considered in relation to a broad spectrum of human diseases illustrating how genes can be used for gene replacement, tissue engineering, destruction of unwanted tissues, or immune stimulation. Stages in the development of gene-based drugs & biologics will be studied from vector design through preclinical proof of efficacy, clinical protocol development, product manufacture, pharmacology and toxicology testing, analysis of clinical trial outcomes, regulatory affairs, patenting and partnering with industry. *The Regulatory/Translation pathway is designed for those learners who desire to conduct or participate in research that will identify therapies/devices that will move into manufacturing facilities.*

The **Research Pathway** student will learn from and work alongside faculty members who have primary interests in virology, viral vectors and gene therapy and will develop research skills in conducting and participating in vaccine and gene therapy discovery. These areas overlap with the fields of biochemistry, cell and molecular biology, genetics, and immunology and regulatory science. *The Research pathway is designed for learners who desire to be an informed member of a research team conducting or participating in Virology and Gene Therapy research.*

Coursework

Scholars in the Postdoctoral Master's Degree Program in virology and gene therapy are expected to gain competencies through carefully selected didactic coursework and a mentored research project.

Code	Title	Hours
MGS		
MGS 6000	Responsible Conduct of Research	1
MGS 5050	Critical Thinking and Scientific Writing	2
BMB 5100	Chemical Principles of Biopolymer Systems	2
VGT 5700	Virology and Gene Therapy	3
Journal Club		
VGT 6740	Viruses and Vectors Journal Club (1 cr./yr.)	1
VGT 6745	Current Topics in Virology and Gene Therapy (1 cr./yr.)	1
Track Requirements		
Select 5 or 7 credits depending on chosen pathway		5-7
Advanced Coursework		
Select 9 or 11 credits based on chosen pathway ¹		9-11
Research		
MGS 6100	Master's Thesis Proposal	3
MGS 6840	Master's Research (4 cr/qtr - 4 qtrs required)	16
Total Hours		43-47

¹ Any courses approved for graduate credit; select in consultation with your mentor.

Track Required Courses

Regulatory/Translation Pathway

Code	Title	Hours
CTSC 5020	Regulatory Issues in Clinical Research	1
CTSC 5025	Introduction to Regulatory Science	1

CTSC 5040	Introduction to the Principles of Current Good Manufacturing Practices (cGMP)	1
CTSC 5300	Foundations of Epidemiology	1
CTSC 5600	Introduction to Statistics in Clinical and Translational Research	3
Total Hours		7

Research Pathway

Code	Title	Hours
VGT 6888	Molecular Therapy Tutorial	2
IMM 5100	Basic Graduate Immunology	3
Total Hours		5

Graduation Requirements

The degree requirements include:

- A minimum of 45 credits (includes 19 research credits)
- Successfully pass VGT Written Qualifying Exam
- Preparation and successful oral defense of a thesis

Suggested Sequence

This is a suggested sequence based on a summer term start. Individual course plans may vary depending on true start date, program, employment/ personal commitments, and research interests. Be sure to confirm you have met your requirements using your degree planning tool. Course offerings may vary slightly. Current course offerings are posted in the course catalog.

Research Pathway

Code	Title	Hours
First Year - Summer Term		
MGS 5050	Critical Thinking and Scientific Writing	2
MGS 6000	Responsible Conduct of Research	1

Code	Title	Hours
First Year - Fall Term		
BMB 5100	Chemical Principles of Biopolymer Systems	2
IMM 5100	Basic Graduate Immunology	3

Code	Title	Hours
First Year - Winter Term		
VGT 5700	Virology and Gene Therapy	3
Electives		

Code	Title	Hours
First Year - Spring Term ¹		
VGT 6888	Molecular Therapy Tutorial (Even years)	2
Electives		

Code	Title	Hours
Second Year - Summer Term		
Electives		

Code	Title	Hours
Second Year - Fall Term		
VGT 6740	Viruses and Vectors Journal Club	1

VGT 6745	Current Topics in Virology and Gene Therapy	1
Electives		

Code	Title	Hours
Second Year - Winter Term		
Electives		

Code	Title	Hours
Second Year - Spring Term		
Electives		

Code	Title	Hours
Third Year - Summer Term		
Electives		

Code	Title	Hours
Third Year - Fall Term		
Electives		

Code	Title	Hours
Third Year - Winter Term		
Electives		

Code	Title	Hours
Third Year - Spring Term		
Electives		

Code	Title	Hours
Fourth Year - Summer Term		
MGS 6400	Master's Capstone Project	6
Electives		

Regulatory/Translational Pathway

Code	Title	Hours
First Year - Summer Term		
MGS 5050	Critical Thinking and Scientific Writing	2
MGS 6000	Responsible Conduct of Research	1

Code	Title	Hours
First Year - Fall Term		
BMB 5100	Chemical Principles of Biopolymer Systems	2
CTSC 5300	Foundations of Epidemiology	1

Code	Title	Hours
First Year - Winter Term		
VGT 5700	Virology and Gene Therapy	3
CTSC 5020	Regulatory Issues in Clinical Research	1

Code	Title	Hours
First Year - Spring Term ^{1,2}		
Electives		

Code	Title	Hours
Second Year - Summer Term ³		
CTSC 5025	Introduction to Regulatory Science	1

CTSC 5040	Introduction to the Principles of Current Good Manufacturing Practices (cGMP)	1
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Electives

Code	Title	Hours
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Second Year - Fall Term

VGT 6740	Viruses and Vectors Journal Club	1
VGT 6745	Current Topics in Virology and Gene Therapy	1

Electives

Code	Title	Hours
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Second Year - Winter Term

CTSC 5600	Introduction to Statistics in Clinical and Translational Research	3
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Code	Title	Hours
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Second Year - Spring Term

Electives

Code	Title	Hours
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Third Year - Summer Term

Electives

Code	Title	Hours
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Third Year - Fall Term

Electives

Code	Title	Hours
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Third Year - Winter Term

Electives

Code	Title	Hours
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Third Year - Spring Term

Electives

Code	Title	Hours
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Fourth Year - Summer Term

MGS 6400	Master's Capstone Project	6
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Electives

¹ Written Qualifying Examination due by end of term unless you do not take VGT 5700

² Suggested to take VGT 6884 (even), 6886 (odd) and 6888 (odd) as electives during this term

³ Mentor Selection Suggested by End of Term