# VIROLOGY AND GENE THERAPY (VGT)

**VGT 5300 Molecular Therapy Lecture Course (1 Credit)**
P. Devaux, K. Mohni (Winter) – After attending this course the student will have gained an appreciation of the broad potential scope of molecular therapies and should understand how to develop a DNA, RNA, virus, or cell-based therapeutic from an idea to a validated product. Various molecular and cellular therapeutic strategies will be considered in relation to a broad spectrum of human diseases illustrating how they can be used for gene replacement, tissue engineering, destruction of unwanted tissues, or immune stimulation. Stages in the development of these drugs 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.
Grading: Standard Letter

**VGT 5500 From Viruses to Vectors Lecture Course (1 Credit)**
P. Devaux, K. Mohni (Winter) – This course will introduce non-viral and physical methods for gene or RNA delivery as a prelude to a deeper dive into viral vectors. The course will discuss how different types of viruses are converted into nucleic acid delivery vectors. The course will discuss promising applications of the vectors as well as current challenges making safe, efficient, targeted vectors for gene therapy vaccines and oncolytic virotherapy.
Grading: Standard Letter

**VGT 5600 Molecular Virology Lecture Course (1 Credit)**
K. Mohni, P. Devaux (Winter) – We highlight unifying principles emerging from the study of animal viruses. Using selected examples, we illustrate virus structure, cell entry and receptors, replication of retroviruses, DNA viruses and riboviruses, transcription and RNA processing, translation and intracellular transport, particle assembly and cell escape. We discuss which questions are still outstanding and introduce emerging viruses.
Grading: Standard Letter

**VGT 5650 Emerging Pathogens Journal Club (1 Credit)**
M. Barry (Summer) – The emergence persistence of pathogens that cause human and animal diseases have continued to surge despite technological and medical advances in the past century. COVID-19 is the most recent example. This journal club will survey emerging and emerged pathogens in a journal club format.
Grading: Sat / Unsat

**VGT 5700 Virology and Gene Therapy (3 Credits)**
K. Mohni, P. Devaux (Winter)– This course is designed to introduce the topics of molecular virology and the clinical application of viral vectors for therapeutic purposes. The course is broken up into three sections: Basic science (VGT5600), Vectors (VGT5500), and Molecular Therapy (VGT5300). It is recommended that students be familiar with basic cell biology concepts prior to taking this course. There are two associated tutorials. The Molecular Virology tutorial (VGT 6886) is offered on odd years. Students present and discuss manuscripts that have shaped or are shaping the field of virology. The Molecular Therapy tutorial (VGT 6888) is offered on even years. Students discuss relevant and new literature in the fields of Gene Therapy, Oncolytics, and Regenerative Medicine. Course previously listed as CORE 6770.
Grading: Standard Letter

**VGT 6740 Viruses and Vectors Journal Club (1 Credit)**
A. Schulze (993: Fall, Winter, Spring) – Each week from September to June the VGT 6740 Journal Club will cover in-depth one or more key publications in the Virology and/or Gene Therapy fields. This course provides students the opportunity to develop their critical thinking, scientific analysis, and communication skills while staying up to date in the fields of Virology and Gene Therapy. One person per week will present (30-40 minutes presentation and 10-20 minutes discussion). The journal club session will be student led by student moderator(s). Faculty will be in attendance to provide advanced insights when needed; however, the discussion is expected to be mainly student-focused. Register in Fall quarter only (1 cr./yr.) Attendance is required for fall, winter, and spring. All students in the pre-doctoral program are expected to attend all Journal Club sessions.
Prerequisites: (VGT 5700, or CORE 6770)
Grading: Standard Letter

**VGT 6745 Current Topics in Virology and Gene Therapy (1 Credit)**
M. Barry (993: Fall, Winter, Spring) – This is a weekly seminar course in which visiting seminar speakers alternate with Mayo investigators. The format is a one-hour seminar in which the presenter gives a detailed account of their own virology or gene therapy research followed by a lively question and answer session. From 2nd year on: Register in fall quarter only (1 cr./yr.). Attendance is required by all students.
Grading: Sat / Unsat

**VGT 6884 Viral Disease Tutorial (2 Credits)**
C. Pfaller (Odd: Spring) Virus pathology and disease tutorial. Major viruses and their molecular biology, pathogenesis and clinical features, emerging pathogens, therapeutic strategies. Important viral infections will be covered; emphasis will also be placed on emerging viruses of strong topical or emerging interest. Discussion will center on important papers after introduction to topic by faculty.
Grading: Standard Letter

**VGT 6886 Molecular Virology Tutorial (2 Credits)**
R. Cattaneo (Odd: Spring) – This tutorial is a companion to the Molecular Virology course. It deepens the subjects illustrated in the lectures. Publications that have contributed in shaping the field or have identified new principles will be introduced by staff members and presented by the students.
Grading: Standard Letter

**VGT 6888 Molecular Therapy Tutorial (2 Credits)**
P. Devaux (Even: Spring) – The major goal of this tutorial is to develop a broad understanding of the field of clinical gene transfer and therapy. Tutorials will range from the scientific and biological aspects of gene vectors and safety to the conduct and regulatory issues of clinical gene transfer trials. A variety of instructors will discuss pertinent questions involving the development and practice of ongoing clinical trials. These trials will include those that address infectious disease, malignancies, and cardiovascular disease.
Grading: Standard Letter