



M&I/BMS 777 Syllabus

Gene Therapy

CREDIT HOURS	4.0	DAY	Tuesday & Thursday
LOCATION	Room 309 Oelman Hall	TIME	10:25 a.m. to 12:05 p.m.
INSTRUCTOR	Dawn P. Wooley, Ph.D. Room 016 Math & Micro Bldg. Phone: 775-4993; Fax: 775-3391 E-mail: dawn.wooley@wright.edu	OFFICE HOURS	12:05 p.m. to 1:05 p.m. on Tuesdays and also by appointment

COURSE DESCRIPTION

The molecular basis of gene therapy and the use of viral gene delivery systems for the treatment of human disease are examined. Gene therapy strategies are contrasted with various diseases, including cancer and AIDS.

GOALS

This course targets graduate-level students in the basic science departments in the College of Science and Mathematics. The course is designed to give students knowledge of the science of gene therapy. Students will comprehend the different types of gene delivery systems and how gene therapy can be used to treat human disease. Current literature will be analyzed, synthesized, and evaluated by the student for presentation of a research topic.

TEXT

Handouts and journal articles as assigned.

PERFORMANCE OBJECTIVES

The purpose of the course is to provide a foundation for the basic science of gene therapy. At the conclusion of this course, the student will be able to:

- Describe and discuss the meaning of gene therapy.
- Use and understand the basic vocabulary of gene therapy.
- Explain the types of viral gene delivery systems.

PERFORMANCE OBJECTIVES (continued)

- Explain the physical methods of gene transfer.
- Describe methods of regulating gene expression.
- Interpret targeted vector system technology.
- Recognize the advantages, disadvantages, and limitations of gene therapy.
- Contrast gene therapy strategies with clinical applications.
- Analyze a topic of current relevance to gene therapy and report the results of the analysis in a paper and by oral briefing to the class.

GRADING POLICY

Award of letter grades, at course completion, reflecting the level of achievement of the course's performance objective is based on the scale:

A	B	C	D	F
100-90.00%	89.99-80.00%	79.99-70.00%	69.99-60.00%	<60.00%

Achievement is demonstrated through performance on the following measurement and learning devices:

Midterm Exam	20%	End of Course Exam	30%	Presentation	20%
Written Assignments	20%	Participation	10%		

COURSE SCHEDULE

The class will meet twice each week for the quarter.

JANUARY 8: Course Introduction

Student Introductions • In-Class Writing Assignment • Requirements and Expectations

JANUARY 10: Overview of Gene Therapy and Retroviruses as Vectors 1

Strategies • Requirements • Clinical Applications • Future Problems and Ethical Issues

JANUARY 15: Retroviruses as Vectors 2

Retrovirus Structure/Taxonomy/Life Cycle • Vectors & Packaging

JANUARY 17: Retroviruses as Vectors 3

Midterm Topic Due • Accuracy/Regulation/Efficiency • Safety • Human Trials

JANUARY 22: Adenovirus and Adeno-associated Virus Mediated Gene Transfer 1

Adenovirus Structure • Taxonomy • Life Cycle • Vectors

JANUARY 24: Adenovirus and Adeno-associated Virus Mediated Gene Transfer 2

Advantages and Drawbacks for Gene Therapy • Potential Solutions

JANUARY 29: Herpes Virus-based Vectors 1
Abstract Due • Biology of Herpes Simplex Virus • Productive and Latent Infections

JANUARY 31: Herpes Virus-based Vectors 2
HSV Vectors • In vivo Gene Delivery using HSV Vectors

FEBRUARY 5: Pox Virus-based Vectors
Biology of Pox Virus • Vector Design • Pros and Cons

FEBRUARY 7: Non-viral Approaches to Gene Therapy
Particles • DNA Injection • Liposomes • Virus-enhanced Gene Delivery

FEBRUARY 12: Gene Therapy for Cancer 1
Viral Vaccines

FEBRUARY 14: Midterm and Gene Therapy for Cancer 2
Midterm & Writing Assignment #1 Due • Viral Vaccines: T-Lymphocyte Protocols

FEBRUARY 19: Gene Therapy for Cancer 3
Writing Assignment #2 Due • Viral Vaccines: Why do they work for only some people?

FEBRUARY 21: Gene Therapy Gone Wrong 1
Writing Assignment #3 Due • Midterms returned • Fischer Study on X-SCID

FEBRUARY 26: Gene Therapy Gone Wrong 2
The Death of Jesse Gelsinger

FEBRUARY 28: Special Topics in Gene Therapy 1
To Be Announced

MARCH 4: Special Topics in Gene Therapy 2
To Be Announced

MARCH 6: Special Topics in Gene Therapy 3
To Be Announced

MARCH 11: Special Topics in Gene Therapy 4
To Be Announced

MARCH 13: Special Topics in Gene Therapy 5
To Be Announced • End of Course Exam Due

DAWN P. WOOLEY, Ph.D., SM(NRM), RBP, CBSP