M&I/BMS 7770 Syllabus

Gene Therapy

CREDIT HOURS 3.0  DAY Tuesday & Thursday
LOCATION Room 105 Bio Sci  TIME 8:00 a.m. to 9:20 a.m.
INSTRUCTOR Dawn P. Wooley, Ph.D.  OFFICE 9:20 p.m. to 10:20 a.m.
Location: Room 016 Math & Micro Bldg.
Phone: 775-4993; Fax: 775-3391
HOURS on Thursdays and also
E-mail: dawn.wooley@wright.edu
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.
• 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.
PERFORMANCE OBJECTIVES (continued)

- 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:

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<td>Grade</td>
<td>100-90.00%</td>
<td>89.99-80.00%</td>
<td>79.99-70.00%</td>
<td>69.99-60.00%</td>
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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 12:** Course Introduction
  - Student Introductions • In-Class Writing Assignment • Requirements and Expectations
- **JANUARY 14:** An Introduction to Viral Vectors, Part I
  - History of Gene Transfer • Nonviral Gene Transfer • Gene Therapy Strategies
- **JANUARY 19:** An Introduction to Viral Vectors, Part II
  - Molecular Biology and Virology Basics • Retroviruses
- **JANUARY 21:** An Introduction to Viral Vectors, Part III
  - Adenoviruses • Other Viral Systems • Safety and Compliance
- **JANUARY 26:** Retroviruses as Vectors 1
  - Midterm Topic Due • Discussion of Assigned Journal Articles
- **JANUARY 28:** Retroviruses as Vectors 2
  - Discussion of Assigned Journal Articles
- **FEBRUARY 2:** Retroviruses as Vectors 3
  - Discussion of Assigned Journal Articles
- **FEBRUARY 4:** Adenoviruses as Vectors
  - Discussion of Assigned Journal Articles
FEBRUARY 9: Adenoviruses and Adeno-associated Viruses (AAV) as Vectors
   Discussion of Assigned Journal Articles
FEBRUARY 11: AAV (continued) and Herpes Viruses as Vectors
   Discussion of Assigned Journal Articles
FEBRUARY 16: Pox Viruses as Vectors
   Discussion of Assigned Journal Articles
FEBRUARY 18: Rabies Viruses as Vectors
   Discussion of Assigned Journal Articles
FEBRUARY 23: Gene Therapy for Cancer 1
   Viral Vaccines
FEBRUARY 25: Midterm Due and Gene Therapy for Cancer 2
   Viral Vaccines: T-Lymphocyte Protocols
MARCH 1: Spring Break (no class)
MARCH 3: Spring Break (no class)
MARCH 8: Gene Therapy for Cancer 3
   Viral Vaccines: Why only work for some?
MARCH 10: Gene Therapy Gone Wrong
   The Death of Jesse Gelsinger
MARCH 15: Special Topics in Gene Therapy 1
   Student Presentations
MARCH 17: Special Topics in Gene Therapy 2
   Student Presentations
MARCH 22: Special Topics in Gene Therapy 3
   Student Presentations
MARCH 24: Special Topics in Gene Therapy 4
   Student Presentations
MARCH 29: Special Topics in Gene Therapy 5
   Student Presentations
MARCH 31: Special Topics in Gene Therapy 6
   Student Presentations
APRIL 5: Special Topics in Gene Therapy 7
    Student Presentations
APRIL 7: Special Topics in Gene Therapy 8
    Student Presentations
APRIL 12: Special Topics in Gene Therapy 9
    Student Presentations
APRIL 14: Special Topics in Gene Therapy 10
    Student Presentations
APRIL 19: Special Topics in Gene Therapy 11
    Student Presentations
APRIL 21: Special Topics in Gene Therapy 12
    Student Presentations / Final Exam Due

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