


  
 Gene Therapy and Molecular Medicine Course (Med 271)
   
 Spring 2009
   
 Thursdays, 1:15 – 3:00 p.m.
   
 Stein Clinical Research Building, Room 148

DATE	TITLE	LECTURER
April 2	Gene therapy: An overview	T. Friedmann
April 9	Viral vector for gene transfer	A. Miyanohara
April 16	siRNA & microRNA-mechanisms & potential clinical applications	D. Looney
April 23	Nucleic acids & innate immunity	T. Horner
April 30	Gene therapy for leukemia	L. Rassenti
May 7	Gene therapy for Diabetes	F. Levine
May 14	Gene vaccination	M. Corr
May 21	Gene therapy for arthritis	D. Boyle
May 28	Non-coding DNA: therapeutic applications	E. Raz
June 4	Course Summary: Dr.'s T. Horner & E. Raz	T. Horner, E. Raz
June 11	FINALS	

#### Course Directors

- Eyal Raz, M.D., Stein Clinical Research Building, 1st floor, 858-534-5444  
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- Tony Horner, M.D. , IMG building 4-Rm 164, 858-534-5435  
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#### Expectations

You will be expected to attend at least 8 of the 10 lectures to receive a passing grade in this class. Also, if you are taking MED271 for a letter grade and would like to receive an A, you will need to identify, read, and critically review an original research paper related to one of the lectures (see next page). Finally, as a seminar participant we encourage you to play an active role in your education. In other words, feel free to ask questions during the lectures if speakers are unclear, you require more background information, or you are curious about issues related to the lecture. You should also feel free to contact lecturers outside of class to further supplement your educational experience.

#### General Information

1. Department: **Medicine**
2. Course Number: **MED 271**
3. Course Title: **Gene Therapy and Molecular Medicine**
4. Instructor(s): **Eyal Raz and Anthony Horner**
5. Mail code (or address): **0663**
6. Where and with whom should the student go to sign up for the course?  
**Denise Le Strange, Electives Coordinator**  
**Division of Medical Education**  
**Mail Code 0729, Fax# 858-822-3067**

**Article critiques are encouraged by all but are only required if you are taking this class for a letter grade and would like to receive an A.**

**Article Critique:** We would like you to identify and review a paper of your choosing. Once you have selected an article that interests you, we ask that you discuss your selection with one of the course coordinators to confirm that the paper is worthy of critical analysis. The critique should be approximately 2 typed pages and should conform roughly to the outline suggested below.

**How to critically analyze a research article:**

- 1) *Identify the journal, the investigators, and their institutions:* Is the journal of high quality? Do the investigators have a track record in the field of investigation? Have they published other articles of importance? Do the researchers conduct their investigations at major or minor research institutions? The purpose of this analysis is to determine the likelihood that the studies were conducted well, that the results will be reproducible, and that the experiments have considered all the potential confounding variables, which might contribute to the observed results. This exercise serves to provide some quality control for assessing the importance (impact) of the research article.
- 2) *Background:* What was known before the present studies were published? This information is often reviewed in the introduction of the article but should be supplemented by other articles that you have reviewed on the same or similar subjects. It is critically important to have a context with which to interpret the results presented in a paper. Think of the research article as a tree. Then the background is the forest in which this tree lives. If you are familiar with the context in which studies are conducted, it will allow you to appreciate the significance of experimental findings or to conclude that they replicate previous investigations.
- 3) *Objective:* Why were the present investigations conducted? On what foundation was the hypothesis of the paper founded. Is this hypothesis well supported in the literature? Is there an important scientific question(s) that is being addressed in the published series of experiments?
- 4) *Methods:* What techniques were utilized to meet the objective of the investigations? Are these methods reliable, accepted techniques or are they controversial? Are the methods novel? Are the research techniques well suited for the investigations that were undertaken? What problems exist with the design of the experiments? Are there other methods that you would consider using in addressing the objectives of the studies? Also one must consider the doses of reagents used to generate an experimental effect. Are they reasonable? Could these doses be delivered in *in vivo* systems or in patients, if the paper presents pre-clinical data.
- 5) *Results:* Are the results striking? Statistically significant findings and biologically significant findings are not necessarily the same. For example, if a paper finds that oranges decrease the blood pressure of hypertensive patients by 5mm Hg ( $p= 0.001$ ), but blood pressure in all subjects eating oranges remains dangerously high, then the findings of the study might have statistical but not biological significance. Are there interpretations which cannot be excluded based on the results presented in the paper? A common shortcoming with research articles is that the results do not exclude interpretations of the data not directly considered by the investigators. Have the experiments been conducted an adequate number of times and under an adequate number of experimental conditions to assure that the results are reproducible? In an effort to publish results, investigators may be tempted to submit an incomplete data set for publication. To critically review an article, one must look at the number of times an experiment has been conducted, the number of duplicate samples for each experimental group, the standard error within each experimental group, and the way in which the data is presented.

- 6) *Discussion*: Do the results of the paper support the author's conclusions? To what extent are the author's conclusions supported by data presented within the paper vs. results presented in previous articles? To what extent have the author's generalized their conclusions and are these generalizations justified by the data and/or previous observations? Most importantly, do you agree with the author's interpretation of their results? What experiments would you consider conducting to confirm the author's interpretation of their findings? What studies do you think the investigators (or you) should conduct to move the present field of investigation forward.
- 7) *Critique*. Do you identify any flaw or any problem in the various sections of the article? How would you do it differently?
- 8) *Personal conclusions*: Do you consider the paper important, why or why not? Do the results have relevance in terms of understanding the physiology of health, the pathophysiology of disease? Would the gene therapy approaches used in the study be likely to be effective in humans?