

BIOC 644
TOPICS IN MUSCLE BIOLOGY for TEACHERS
Web-based course

Summer 2009: June 10 – July 21

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DESCRIPTION: This web-based course will cover the basics of muscle biology by focusing on topics of current public interest and will be centered around an interactive discussion of the weekly readings. Coverage of each topic will start with the analysis of a recent media article intended for the general public and the questions it raises, supplemented by readings in basic anatomy and physiology essential to understanding the topic. Each topic will culminate with an in-depth discussion of two relevant primary research articles to address some of these questions and provide further insight into muscle physiology.

GOALS: Through weekly reading, questioning and discussing selected media and research articles, this course seeks to:

- 1) Provide further understanding of muscle physiology and pathology
- 2) Facilitate application of theoretical knowledge to the daily functioning of the human body
- 3) Develop further understanding of scientific research methods and literature
- 4) Provide ideas for both content and approach for use in science classes

REQUIREMENTS:

All students will be responsible for the following:

- For each week's topic:
 - ~ reading 3-5 media, basic science and primary literature articles or reviews
 - ~ generating pertinent questions and issues related to the readings
 - ~ being prepared to answer selected question (as per your weekly assignment)
- Active participation in general class discussion (i.e., beyond that required for your selected question)
- Muscle Biology Teaching Module: This will be a collation of materials on a muscle-related topic of your choice to enable use in your classroom
 - ~ Due dates and details on last page.

GRADING:

- Each week's participation will contribute to your grade.
- For Weeks #2-5, your contribution during each will comprise 20% of your total grade, point distribution will depend on both the quality and quantity of your participation.
- The Muscle Biology Teaching Module will comprise 15% of your total grade.

COURSE FORMAT

Each week, we will cover a different topic in muscle biology by progressing through the following set of questions:

A. What do we know about the topic? :

- How does the media portray this issue?
- What background knowledge do you, your family or students have about this topic?
- What potential misconceptions might there be about this issue?

B. What do we need to know?

- What key anatomical, physiological, cellular information is needed to further understand the issue?
- What are the key social, financial, ethical considerations in the real-life application of this issue?

C. How will we find out?

- What are the historical perspectives in investigating questions related to this issue?
- What are the current techniques utilized to further investigate this issue?
- What additional questions need to be addressed and how will they be investigated?

READINGS:

Readings relevant to each of the above steps will be posted the Friday before the week's discussion and will include:

- 1-2 articles from the media (i.e. public press or video) to jumpstart the discussion and set the context & relevance for the topic
- A review article or book chapter(s) to provide the foundation of essential basic physiology underlying the issues,
- 1-2 primary research articles to provide further understanding of the issues involved, including key discoveries, historical perspective, common research methods utilized and potential controversies regarding the mechanisms or hypotheses.

DISCUSSION GROUPS:

There will be 2 groups for each week's discussion:

- **Basic Science group:** responsible for providing the essential background ala parts B & C above.
- **Applications group:** responsible for addressing the various ethical, cultural, social and financial aspects of this topic as it is applied to daily life ala part A above, AND for commenting on the posts by the Basic Science group.

No matter your group assignment, this will be accomplished by the following steps:

- Generate a list of questions that intrigue you about the relevant reading
- Choose & post one of those questions indicating what information you will be contributing
- Post your synthesized answer
- Comment on and/or expand on the answers provided by your classmates

The first week of class you will choose which 2 topics you will be in the Basic Science Group and which 2 in the Applications group.

PREPARATION for each week will involve the following:**Wednesday and Thursday = Media/Basic Science Component:****Everyone:**

- ~ Read the assigned media articles
- ~ Generate a list of questions, issues, misleading statements based upon your reading or your own background

Basic Science Group

- ~ Generate a list of questions re: the basic science background that needs to be addressed in order to understand the topic.
- ~ By 10:00 pm Wednesday each person in this group will post one of their questions in the Basic Science section. Each question must be unique (to avoid overlap of effort), so be sure to read all others posted before you post your question to answer.
- ~ By 10:00 pm Thursday prepare and post an answer to your posted question, using your assigned readings as reference sources. Supplemental materials are always welcome.

Applications Group

- ~ Generate a list of questions re: the ethical, financial, social, cultural issues that should be addressed to further understand the topic.
- ~ By 10:00 pm Wednesday each person in this group will post one of their questions. Each question must be unique (to avoid overlap of effort), so be sure to read all others posted before you post your question to answer.
- ~ By 10:00 pm Thursday prepare and post an answer to your posted question, using your assigned readings as reference sources. Supplemental materials are always welcome.

Friday - Tuesday = Research Component:**Everyone:**

- ~ Read the assigned primary research articles
- ~ Generate a list of questions, issues, confusing statements based upon your reading and your own background.

Basic Science Group:

- ~ A list of questions which will help guide us through the discussion of the research articles will be posted.
- ~ By Friday 10:00 pm sign up for one of these questions and be responsible for posting a synthesized answer.
- ~ By Monday 10:00 pm post your answer to your selected question
 - o HINTS: Read the assigned research articles first more globally for a general overview
 - o Reread the articles more specifically to enable you to answer your assigned question
 - o Additional materials may be provided to help you with your answer. Be sure to check the readings list for these.

Applications Group:

- ~ You will be commenting on material posted by both groups. Please note both your comment must be a significant posting, adding something of substance to the discussion. This could consist of new ideas, corrections or edits of posted answer, your perspectives and/or additional references to help flesh out the answer further.
- ~ By Friday 10:00 pm, comment on at least one of the posted answers in the Basic Science Section.
- ~ By Monday 10:00 pm comment on at least one of the posted answers in the Applications section.
- ~ By Tuesday 10:00 pm. Comment on at least one of the posted answers in the Research section

Tuesday = Thought Question Component:**Everyone:**

- ~ By Monday 10:00 pm **Post** a short (250 word max) response to the thought question.
- ~ The question will be posted along with the readings, so you can respond at any time during the week. However, keep in mind the material posted by your classmates during the week as you craft your response to this question.
- ~ By Tuesday 10:00 pm Comment on at least one of the Thought Question responses

PROPOSED SCHEDULE

The following is a tentative list of the topics to be discussed though these may change during the session as new articles or ideas from the class present themselves.

<u>DATE</u>	<u>DISCUSSION TOPIC</u>
June 10-16 Week 1	On-Line orientation Introduction: Class Overview Welcome and initial discussion: Nagging questions – what do we want to know about muscle?
June 17-23 Week 2	Duchene’s Muscular Dystrophy: Anatomy of a muscle gone awry
June 24 -30 Week 3	The wrinkle –erasing ‘miracle’ of Botox: neuromuscular transmission
July 1-7 Week 4	Steroids & Gene Doping: Growth, repair & regeneration
July 8-14 Week 5	Creatine: muscle energetics and metabolism
July 15-21 Week 6	Short reports on Teaching Module projects.

NOTE: There is no final for this course

MUSCLE BIOLOGY TEACHING MODULE PROJECT

☒ As physiology specialists, you have been asked to put together an informational packet about a hot new topic that appeared in the media this summer. Instructions and due dates are as follows. NOTE: Each due date is by Friday at noon of the stated week EXCEPT For Week 6.

In addition the following, you must comment on someone else’s project in each of the 4-6th Week’s postings.

Tuesday of Week 3: Topic:

- Choose a topic of interest related in some way to muscle, that will fit into the curriculum of a class you teach now or would like to teach in the near future

Tuesday of Week 4: Media Article & Questions:

- Post a copy of a media article(s) concerned with this topic. This should be relatively recent (i.e., less than 3 years old) and should include the authors, title, date and source. If the article is on-line, you must include both a 'written' copy and the link to the article.
- Post a list of 10 questions related to the media article(s) which one could use to probe the topic. (NOTE: these should include questions oriented to both Basic science and to ethical, social, etc. aspects of the topic)

Tuesday of Week 5: Basic Science Refs:

- Post an annotated Bibliography containing at least 3 references for basic science and/or physiology information. This may include textbook chapters or parts of chapters, published reviews or links to on-line material (course notes, tutorials, etc.)
- These resources should provide specific support for the questions posted in section above

Friday of Week 6: Primary Research Refs:

- Post the references and/or links to 2 related primary research articles which are concerned with some aspect of your topic. The reference for each should include the author, title, journal, date, volume and pages, and the abstract.
- Post a set of 5 questions for each of the 2 articles. These questions should promote student focus on key issues raised by the article