


Biology of Obesity and Weight Loss (3 credits) BIOL508

Scheduled time: Lecture MTWR online

When: 4.30 pm -6.35 pm Mon May 23 – Wed. Jun 22, 2022

Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Class	4:30 pm - 6:35 pm	MTWR	ON LINE	May 17, 2021 - Jun 19, 2021	Lecture	Anna V Baranova (P) 

**Instructor(s): Ancha Baranova
Yuliya Dobrydneva, Ph.D**

[abaranov@gmu.edu;](mailto:abaranov@gmu.edu)
[ydobrydn@gmu.edu;](mailto:ydobrydn@gmu.edu)

phone 571-334-1145

ZOOM LINK FOR EVERY DAY

<https://us02web.zoom.us/j/88392268132?pwd=R2tOdk4waUMrMmdtVk9MRIM0Q2pldz09>

Meeting Identifier: 883 9226 8132

Access code: 364683

one touch connect

+16465588656,,88392268132#,,,,*364683# (New York)

+13017158592,,88392268132#,,,,*364683# (Washington DC)

+1 646 558 8656 (New York)
+1 301 715 8592 (Washington DC)
+1 312 626 6799 (Chicago)
+1 669 900 9128 (San Jose)
+1 253 215 8782 (Tacoma)
+1 346 248 7799 (Houston)

Textbook:

Textbook of Obesity (2012) by John Wiley and Sons, LT. Editors: Sharon R.Akabas, Sally Ann Lederman, Barabar J. Moore

Course Prerequisite(s):

Course Description:

This course covers causes and consequences of obesity and weight loss. A variety of molecular concepts will be reinforced across the class. Supportive materials presented in this class will be in form of bargraphs, correlation curves, immunohistochemically stained slides and molecular signaling maps; the ability to understand these means of scientific data presentation is one of the learning outcome of this class. Another important learning

outcome is the development of critical thinking skill that will be evaluated by individual work projects concerning nutraceutical compounds with metabolic effects resulting in an oral presentation.

Course Learning Outcomes:

- Understand causes and consequences of obesity and weight loss.
- Understand general epidemiology and pathology of co-morbid conditions associated with obesity and how obesity aids in progression of these conditions.
- Understand relative contributions of genetic and environmental factors influencing weight gain and weight loss.
- Understand limitation of the diets and the bariatric surgery
- Understand mechanism of the weight loss caused by anti-obesity medications.
- Understand obesity as systemic pro-inflammatory condition
- Be abreast of the recent trends in obesity research,
- Understand information presented as the bargraphs, correlation curves, immunohistochemically stained slides and molecular signaling maps;
- Improve critical thinking skills

Course Schedule

Week	Activity
May 23rd Monday	INTRODUCTORY DISCUSSION. SYLLABUS. TYPES OF EXAMS.
May 24 th , Tuesday	Nutrigenomics / Nutri-science part 1
May 25 th , Wednesday	Nutrigenomics / Nutri-science part 2
May 26 th , Thursday	Epidemiology of obesity. Obesity as chronic disease associated with an increase in morbidity and mortality.
May 30 th Monday	MEMORIAL DAY (ENJOY!)
May 31, Tuesday	Co-morbid conditions associated with obesity: non-alcoholic fatty liver disease, polycystic ovary disease, sleep apnea, arthritis, depression and cancer. Part 1 -- AUDIO FILE UPLOADED. To play each slide, click on a small grey audio button in a middle of the slide. Important: IF your audiofiles do not play at all try this: http://www.codecguide.com/download_k-lite_codec_pack_standard.htm
June 1st, Wednesday	Co-morbid conditions associated with obesity: non-alcoholic fatty liver disease, polycystic ovary disease, sleep apnea, arthritis, depression and cancer. Part 2 -- AUDIO FILE UPLOADED http://www.codecguide.com/download_k-lite_codec_pack_standard.htm
June 2nd, Thursday	EXAM 1 (4:30 pm – midnight).

Week	Activity
June 6th Monday	Genetic influences on obesity, including twin and adoption studies, monogenic rodent models of obesity Genetic syndromes that include obesity as part of the phenotype. Leptin deficiency and leptin resistance. Genetic polymorphisms associated with obesity.
June 7th Tuesday	The biology of the weight loss and weight gain. Why diets often fail. Part 1 -- AUDIO FILE UPLOADED. To play each slide, click on a small grey audio button in a middle of the slide. http://www.codecguide.com/download_k-lite_codec_pack_standard.htm
June 8th Wednesday	The bariatric surgery and its consequences. Anti-obesity medications. Anorexia/Cachexia. Part 2 -- AUDIO FILE UPLOADED http://www.codecguide.com/download_k-lite_codec_pack_standard.htm
June 9th Thursday	Obesity as systemic pro-inflammatory condition. pro- and anti-inflammatory molecules produced by adipose. Brown adipose
June 13th Monday	EXAM 2 (4:30 pm – midnight).
June 14th, Tuesday	Anti-inflammatory melanin biosynthesis: a hypothesis
June 15th, Wednesday	Recent trends in obesity research and nutrigenetics.
June 16th, Thursday	LOOK AT THE PICTURE AND INTERPRET IT EXAM (4:30 pm – midnight).
June 20th, Monday	NUTRACEUTICAL presentations by graduate students
June 21th, Tuesday	NUTRACEUTICAL presentations by graduate students
June 22nd, Wednesday	NUTRACEUTICAL presentations by graduate students
June 23rd, Thursday	FINAL EXAM - comprehensive

Components of the course grade

Component	% grade
Exam 1 (mult choice)	10%
Exam 2 (mult choice)	10%
“Look-at-the-picture and explain it” exam (short answers)	15%
FINAL EXAM (short answers + mult choice)	40%
GRADUATE ESSAY AND PRESENTATION WORK	15%
Graduate Presentation QUIZ (will be given at the same time as final exam)	10%
	100%

Graduate Grading scale:

Grades Scored Between		Will Equal
92	% and 100 %	A
90	% and Less Than 92%	A-
87	% and Less Than 90%	B+
84	% and Less Than 87%	B
80	% and Less Than 84%	B-
77	% and Less Than 80%	C+
70	% and Less Than 77%	C
60	% and Less Than 70%	C-
0	% and Less Than 60%	F

Grades will not be rounded up. Therefore, if you receive a grade of 74.99, your grade will be C+, not a B-.

This class does not allow any extra credit.

EXAMS POLICY:

- THERE ARE ABSOLUTELY NO MAKE-UP EXAMS!
- All EXAMS will be given on Blackboard
Exams are open book, open lecture and timed
- **EACH EXAM will be given at 4:30 pm and collected at MIDNIGHT same day**
- You can use any source you want, but you must work individually

On-time Expectations:

- Let your instructor know of your needs and constraints as early as possible **prior** to the assignment due dates.
- Notify your instructor during the first week of the semester regarding course schedule conflicts due to military obligations and/or religious observances.

- Any notifications beyond the first week of classes or after the exam/quiz due date has passed may not be approved and grade of zero will be entered.

LATE POLICY: PLEASE READ CAREFULLY!

- Students should make every effort to submit/complete assignments on time.
- ***Any assignment that is not turned in on time, without prior arrangements with the instructor, will result in a zero grade for this assignment***
- Any arrangements to extend a deadline for an assignment must be made prior to the deadline.
- No extension will be granted after the deadline.
- Each student is allowed maximum of two (2) extensions per semester. Other requests may not be granted and grade of zero will be entered
- Any assignment/assessment that has not been completed by the end of the semester will receive a grade of zero.

Required Equipment –Since this is an online course and all assessments are complete through the computer, you need to have a computer with a **reliable** internet connection.

**Important:
CLASS PROJECTS**

Class projects are to be submitted via Bb. Presentations are also to be uploaded on BB

INDIVIDUAL CLASS PROJECTS:

African Mango (see as example)

Barberry/berberin

Cinnamon

Chili pepper/capsaicin

Curcumin

Carnitine

Bitter orange

Green coffee extract

Chitosan

Garcinia Cambogia

Raspberry

Hoodia Gordonii

Phaseolus vulgaris

Caralluma fimbriata

PART 1 (PRESENTATION)

Present clinical and biochemical evidence (or lack thereof) for anti-obesity/ anti-diabetes effects and describe active biochemical components of various **over the counter supplements** marketed for weight loss support (list is above). Aim for 15 minutes of talk + Q/A session.

In each case, find supporting literature describing:

- 1) plausible biochemical mechanism of action
- 2) relevant in vitro studies
- 3) studies in animal models
- 4) studies in human cohorts

Make general conclusions and make it interesting!

PART 2 (approx. 3 pages)

Write a detailed design of experiment to obtain definitive prove/rejection of the claim of “weight loss supportive medication” for biochemical component you reviewed. Justify your choice of design, and any primary or secondary outcomes measured, and any follow-up biochemical/molecular research you plan to perform. Make sure that your study is designed in the way to possibly preclude loss of research money: to do that, make sure you include additional secondary outcomes related to general health rather than BMI. In this case, if your compound will fail in weight loss trial, it will possibly be proven efficient in, say, decreasing insulin resistance (other secondary outcomes are also acceptable)

Treat this part as study grant application or the proposal.

Plagiarism:

Plagiarism is the presentation of someone else’s ideas or work as one’s own. Students must give credit for any information that is not either the result of original research or common knowledge. If a student borrows ideas or information from another author, he/she must acknowledge the author in the body of the text and on the reference page. Students found plagiarizing are subject to the penalties outlined in the Policies and Procedures section of the University Catalog, which will result in a hearing by the Honor Code Committee and may include a failing grade for the work in question or for the entire course. The following website provides helpful information concerning plagiarism for both students and faculty:

<http://oai.gmu.edu/honor-code/>

Honor Code:

- George Mason University has an Honor Code, which requires all members of this community to maintain the highest standards of academic honesty and integrity. Cheating, plagiarism, lying, and stealing are all prohibited
- All violations of the Honor Code will be reported to the Honor Committee.
- See <http://oai.gmu.edu/honor-code/> for more detailed information.

Ethics:

Ethical behavior in the classroom is required of every student. The course will identify ethical policies and practices relevant to course topics.

Diversity:

Learning to work with and value diversity is essential in every class. Students are expected to exhibit an appreciation for multinational and gender diversity in the classroom.

Civility:

As a diverse community of learners, students must strive to work together in a setting of civility, tolerance, and respect for each other and for the instructor. Rules of classroom behavior (which apply to online as well as onsite courses) include but are not limited to the following:

- Conflicting opinions among members of a class are to be respected and responded to in a professional manner.
- Side conversations or other distracting behaviors including cell phone use or non-class online access are not to be engaged in during lectures, class discussions or presentations
- There are to be no offensive comments, language or gestures

Students not complying will be asked to cease immediately or leave the class session.

Students with Disabilities:

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Resources at 703.993.2474. All academic accommodations must be arranged through that office.