

Module 4 - Bartel, K., et al. (2019). "Connecting lysosomes and mitochondria - a novel role for lipid metabolism in cancer cell death." Cell Commun Signal **17**(1): 87.

Module 5 - Kim, W., et al. (2019). "Polyunsaturated Fatty Acid Desaturation Is a Mechanism for Glycolytic NAD(+) Recycling." Cell Metab **29**(4): 856-870 e857.
and Lutkewitte, A. J., et al. (2019). "Fatty Acid Desaturation Gets a NAD(+) Reputation." Cell Metab **29**(4): 790-792.

Module 6 - Mokkala, K., et al. (2019). "Interactions of dietary fat with the gut microbiota: Evaluation of mechanisms and metabolic consequences." Clin Nutr.

Module 7 - Lichtenstein, A. H. (2019). "Dietary Fat and Cardiovascular Disease: Ebb and Flow Over the Last Half Century." Advances in Nutrition **10**(Supplement_4): S332-S339.

Module 8 - Jiao, J., et al. (2019). "Dietary fats and mortality among patients with type 2 diabetes: analysis in two population based cohort studies." BMJ **366**: l4009

Module 9 - Julibert, A., et al. (2019). "Dietary fat intake and metabolic syndrome in adults: A systematic review." Nutr Metab Cardiovasc Dis **29**(9): 887-905.

Module 10 - Wilkinson, M. J., et al. (2019). "Ten-Hour Time-Restricted Eating Reduces Weight, Blood Pressure, and Atherogenic Lipids in Patients with Metabolic Syndrome." Cell Metab

Module 11 - de Cabo, R. and M. P. Mattson (2019). "Effects of Intermittent Fasting on Health, Aging, and Disease." New England Journal of Medicine **381**(26): 2541-2551.

Module 12 - Rubovitch, V., et al. (2019). "Dietary Energy Restriction Ameliorates Cognitive Impairment in a Mouse Model of Traumatic Brain Injury." J Mol Neurosci **67**(4): 613-621.

Module 13 - Ludwig, D. S. (2019). "The Ketogenic Diet: Evidence for Optimism but High-Quality Research Needed." J Nutr.

Module 14 - Paoli, A., et al. (2019). "Ketogenic Diet and Skeletal Muscle Hypertrophy: A Frenemy Relationship?" J Hum Kinet **68**: 233-247.

Module 15 - Nathan, J., et al. (2019). "A Switch to Polyunsaturated Fatty Acid Based Ketogenic Diet Improves Seizure Control in Patients with Drug-resistant

Epilepsy on the Mixed Fat Ketogenic Diet: A Retrospective Open Label Trial." Cureus **11**(12): e6399.

Module 16 - Taipale, S. J., et al. (2019). "Tracing the fate of microplastic carbon in the aquatic food web by compound-specific isotope analysis." Sci Rep 9(1): 19894.

Feel like you many need a little background review and update on the current knowledge concerning the nutritional aspects of lipids? We will discuss the following topics using mainly material from the book entitled "**The Molecular Nutrition of Fats**" edited by Vinood B. Patel and published in 2018 by Elsevier:

Classes, Nomenclature, and Functions of Lipids and Lipid-Related Molecules and the Dietary Lipids

Lipid Metabolism: An Overview

Fatty Acids, Gut Bacteria, and Immune Cell Function

Omega-3 Fatty Acids and Epilepsy

Docosahexaenoic Acid (DHA): A Dietary Supplement With Promising Anticancer Potential

Strategies to Counter Saturated Fatty Acid (SFA)-Mediated Lipointoxication

You may be interested in reviewing the following two eBooks in the UF library:

Biochemistry of lipids, lipoproteins and membranes

edited by Neale Ridgway and Roger McLeod.

Published: Amsterdam : Elsevier, 2017.

<http://www.sciencedirect.com/science/book/9780444634382>

The fats of life: essential fatty acids in health and disease

Glen D. Lawrence.

Author: Lawrence, Glen D. 1948-

Published: New Brunswick, N.J. : Rutgers University Press, c2010.

<http://lib.myilibrary.com/Open.aspx?id=256241>

PURPOSE OF COURSE: The purpose of the course is to provide opportunities for students to increase their knowledge of the nutritional aspects of lipids, to critically read the current literature, to communicate the author's ideas, and to communicate their own ideas using traditional techniques and the latest techniques accepted by peer reviewed journals. A project addressing a real world nutrition problem will replace the traditional exams.

COURSE GOALS AND/OR OBJECTIVES: By the end of this course, students will:

- Practice reading and evaluating, in an organized written format, the current literature concerning the nutritional aspects of lipids.
- Demonstrate their skills at leading and participating in oral discussions concerning nutritional aspects of lipids.
- Apply some nutritional aspect of lipids to a current research problem facing the nutritional community.
- Provide editorial assistance to another student's application of some nutritional aspects of lipids to a current research problem facing the nutritional community.
- Demonstrate ability to communicate via a graphical abstract and a video abstract that are being used by more and more journals.

INSTRUCTIONAL METHODS: This class is designed to increase our knowledge of the nutritional aspects of lipids, to facilitate our critical thinking and application of our knowledge to a real world nutrition issue, and to provide opportunities for us to communicate our ideas.

Class presentation and participation - You will be assigned 2 recent articles which will be read by all the class before your presentations. Each article was published or accepted for publication in 2019 and addresses a current question about the nutritional aspects of lipids. You will present the information in the article and any relevant information that you choose. You will be graded on your presentation of the information and your ability to lead a discussion among your classmates on the topic.

For the class periods that you are a reader, you will post to the assignment tool in Canvas your review of the article using the following outline:

I. Questions being addressed by authors

II. Why the authors did what they did

III. What the authors did

IV. What the authors found

V. Authors' take home message

VI. My comments

VII. Contribution to our understanding of the nutritional aspects of lipids

You will also be graded on your verbal participation in the class discussion.

Class Project –David Ludwig, Walter Willett, Jeff Volek, and Marian Neuhouser, who have widely varying perspectives, published a review article in Science on November 16,

2018. In the article they summarized existing evidence to identify areas of broad consensus amid ongoing controversy regarding macronutrients and chronic disease. The seven of the controversies are listed below:

1. Do diets with various carbohydrate-to-fat proportions affect body composition (ratio of fat to lean tissue) independently of energy intake? Do they affect energy expenditure independently of body weight? - **Jim Vinyard**
2. Do ketogenic diets provide metabolic benefits beyond those of moderate carbohydrate restriction? Can they help with prevention or treatment of cardiometabolic disease? - **Vincent Shi**
3. What are the optimal amounts of specific fatty acids (saturated, monounsaturated, polyunsaturated) in the context of a very-low-carbohydrate diet? - **Jazi Bin Zarah**
4. What is the relative importance for cardiovascular disease of the amounts of LDL cholesterol, HDL cholesterol, and triglycerides in the blood, or of lipoprotein particle size, for persons on diets with distinct fat-to-carbohydrate ratios? Are other biomarkers of equivalent or greater importance? - **Pearl Ebea**
5. What are the effects of dietary fat amount and quality across the lifespan on risk of neurodegenerative, pulmonary, and other diseases that have not been well studied? - **Matt Beke**
6. What are the long-term efficacies of diets with different carbohydrate-to-fat proportions in chronic disease prevention and treatment under optimal intervention conditions (designed to maximize dietary compliance)? - **Danielle Aycart**
7. What individual genetic and phenotypic factors predict long-term beneficial outcomes on diets with various fat-to carbohydrate compositions? Can this knowledge inform personalized nutrition, with translation to prevention and treatment? **Eduardo Rodriguez**

The purpose of this project is for each student to choose one of the controversies and address the issues listed as well as any other related issues identified by the student.

Graphical Abstracts - Even before wide use of written language by the general population, concepts and stories were communicated by drawings and oral communication. Scientific papers published before the widespread use of computers to

prepare manuscripts had hand drawn figures and diagrams. Today every graduate student uses computers to generate graphs, tables, and diagrams. For quite a while many of us have looked at the inviting illustrations in textbooks and mechanistic cartoons in papers before reading the text. In recent years several scientific publishing companies have required or suggested a "graphical abstract"

(http://www.cell.com/pb/assets/raw/shared/figureguidelines/GA_guide.pdf) and a "video abstract" (<http://www.cell.com/video-abstract-guidelines>) for each manuscript. As readers we can quickly look at the graphical abstract and video abstract to decide if we want to read the paper and then look at it again after reading the paper as a quick review of what we have just read. It is not easy to prepare a graphical abstract and video abstract. One has to have a very clear idea before preparing a very clear picture that communicates the idea to others. The process of preparing the graphical abstract and video abstract can assist in clarifying the idea in the author's mind.

It is a skill that is important to develop for many reasons including that it is likely to be required by more and more journals. For this class we will prepare graphical abstracts and video abstracts for the class project. For the first "exam", you will be assigned as an editor for another student's documents and you will be graded on the quality of the editorial advice you provide. For the second "exam" you will post your graphical abstract and video abstract that has benefitted from your editor's input and your continued development of your thoughts. You will be graded on the scientific quality of the information.

Some publisher websites with their specific information about graphical abstracts are:

<http://www.elsevier.com/authors/journal-authors/graphical-abstract>

http://www.cell.com/pb/assets/raw/shared/figureguidelines/GA_guide.pdf

https://www.thieme.de/statics/dokumente/thieme/final/de/dokumente/zw_synthesis/CFZ-Sample-Graphical-Abstracts.pdf

http://www.scilogs.com/on_the_road/software-for-drawing-graphical-abstracts/

<http://cmsw.mit.edu/glance-at-graphical-abstracts/>

<http://www.fems-microbiology.org/journals/graphical-abstract.html>

COURSE POLICIES:

ATTENDANCE POLICY: You have to be present in class in order to participate in class discussion

COURSE TECHNOLOGY: HUN 6301 is a blended course utilizing both Canvas and face to face lectures.

UF POLICIES:

UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES: Students requesting accommodation for disabilities must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT: Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at <http://www.dso.ufl.edu/students.php>.

****NETIQUETTE: COMMUNICATION COURTESY:** All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. [Describe what is expected and what will occur as a result of improper behavior] <http://teach.ufl.edu/docs/NetiquetteGuideforOnlineCourses.pdf>

GETTING HELP:

For issues with technical difficulties for E-learning in Sakai, please contact the UF Help Desk at:

- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

**** Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.**

Other resources are available at <http://www.distance.ufl.edu/getting-help> for:

- Counseling and Wellness resources
- Disability resources
- Resources for handling student concerns and complaints
- Library Help Desk support

Should you have any complaints with your experience in this course please visit <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

GRADING POLICIES:

Grades will be determined by adding the points obtained for each activity listed in the following table.

Assignment	Points
2 Class Presentations	36
Class participations	15
14 journal article notes	14
Editorial comments on research partners graphical abstracts (Exam 1)	10
Class project graphical and video abstracts (Exam 2)	25
Total	100

GRADING SCALE:

Final Grade	Total Points
A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62

There will be no curve in this course. Final grades will be simply calculated from the total accumulated points.

COURSE SCHEDULE:

Spring 2020 Course Schedule

<u>Week 1</u>	
Tuesday January 06, 2020	Introduction to course and class project
Friday –, January 10, 2020	Discussion of Classes, Nomenclature, and Functions of Lipids and Lipid-Related Molecules and the Dietary Lipids
<u>Week 2</u>	
Tuesday January 14, 2020	Module 1 Instructor led discussion of “Dietary fat: From foe to friend?” PowerPoint of discussion leader and outlines of the discussants must be posted by noon
Friday –, January 17, 2020	Module 2 Instructor led discussion of “Some Musings About Differential Energy Metabolism With Ketogenic Diets” PowerPoint of discussion leader and outlines of the discussants must be posted by noon
<u>Week 3</u>	
Tuesday January 21, 2020	Discussion of Lipid Metabolism: An Overview and discussion of Class Projects
Friday – January 24, 2020	Module 3 Matt Beke led discussion of "EPA and DHA have divergent effects on serum triglycerides and lipogenesis, but similar effects on lipoprotein lipase activity: a randomized controlled trial." PowerPoint of discussion leader and outlines of the discussants must be posted by noon
<u>Week 4</u>	
Tuesday January 28, 2020	Discussion of Fatty Acids, Gut Bacteria, and Immune Cell Function and discussion of Class Projects
Friday – January 31, 2020	Module 4 Vincent Shi led discussion of "Connecting lysosomes and mitochondria - a novel role for lipid metabolism in cancer cell death."

	PowerPoint of discussion leader and outlines of the discussants must be posted by noon
<u>Week 5</u>	
Tuesday February 04, 2020	Discussion of Omega-3 Fatty Acids and Epilepsy and discussion of Class Projects
Friday – February 07, 2020	Module 5 Eduardo Rodriguez led discussion of "Polyunsaturated Fatty Acid Desaturation Is a Mechanism for Glycolytic NAD(+) Recycling." PowerPoint of discussion leader and outlines of the discussants must be posted by noon
<u>Week 6</u>	
Tuesday February 11, 2020	Discussion of Docosahexaenoic Acid (DHA): A Dietary Supplement With Promising Anticancer Potential and discussion of Class Projects
Friday – February 14, 2020	Module 6 Jim Vinyard led discussion of "Interactions of dietary fat with the gut microbiota: Evaluation of mechanisms and metabolic consequences." PowerPoint of discussion leader and outlines of the discussants must be posted by noon
<u>Week 7</u>	
Tuesday February 18, 2020	Discussion of Strategies to Counter Saturated Fatty Acid (SFA)-Mediated Lipointoxication and discussion of Class Projects
Friday – February 21, 2020	Module 7 Pearl Ebea led discussion of "Dietary Fat and Cardiovascular Disease: Ebb and Flow Over the Last Half Century." PowerPoint of discussion leader and outlines of the discussants must be posted by noon

<u>Week 8</u>	
Tuesday February 25, 2020	Discussion of Class Projects and lipid topics that you suggest
Friday – February 28, 2020	Module 8 Danielle Aycart led discussion of " Dietary fats and mortality among patients with type 2 diabetes: analysis in two population based cohort studies." PowerPoint of discussion leader and outlines of the discussants must be posted by noon
<u>Week 9</u>	
<u>Monday</u> <u>March</u> <u>02 –</u> <u>Friday</u> <u>March</u> <u>06, 2020</u>	Have a safe and fun Spring Break!
<u>Week 10</u>	
Tuesday March 10, 2020	Module 9 Jazi Bin Zarah led discussion of "Dietary fat intake and metabolic syndrome in adults: A systematic review." PowerPoint of discussion leader and outlines of the discussants must be posted by noon Graphical abstract drafts for editor review must be posted to the discussion board by 5:00 PM
Friday – March 13, 2020	Module 10 Vincent Shi led discussion of "Ten-Hour Time-Restricted Eating Reduces Weight, Blood Pressure, and Atherogenic Lipids in Patients with Metabolic Syndrome " PowerPoint of discussion leader and outlines of the discussants must be posted by noon
<u>Week 11</u>	
Tuesday March 17, 2020	Module 11 Jazi Bin Zarah led discussion of "Effects of Intermittent Fasting on Health, Aging, and Disease." PowerPoint of discussion leader and outlines of the discussants must be posted by noon

	Editorial review of graphical abstract drafts must be posted to the discussion board by 5:00 PM
Friday –, March 20, 2020	Module 12 Pearl Ebea led discussion of " Dietary Energy Restriction Ameliorates Cognitive Impairment in a Mouse Model of Traumatic Brain Injury." PowerPoint of discussion leader and outlines of the discussants must be posted by noon

<u>Week 12</u>	
Tuesday March 24, 2020	Dress Rehearsal for Celebration of graphical abstracts and video abstracts – 3 authors and their editors
Friday - March 27, 2020	Module 13 Matt Beke led discussion of "The Ketogenic Diet: Evidence for Optimism but High-Quality Research Needed." PowerPoint of discussion leader and outlines of the discussants must be posted by noon
<u>Week 13</u>	
Tuesday March 31, 2020	Dress Rehearsal for Celebration of graphical abstracts and video abstracts – 3 authors and their editors
Friday – April 03, 2020	Module 14 Jim Vinyard led discussion of " Ketogenic Diet and Skeletal Muscle Hypertrophy: A Frenemy Relationship?" PowerPoint of discussion leader and outlines of the discussants must be posted by noon
<u>Week 14</u>	
Tuesday April 07, 2020	Graphical abstracts must be posted to the discussion board and to the assignment tool by noon
Friday – April 10, 2020	Module 15 Danielle Aycart led discussion of " A Switch to Polyunsaturated Fatty Acid Based Ketogenic Diet Improves Seizure Control in Patients with Drug-resistant Epilepsy on the Mixed Fat Ketogenic Diet: A Retrospective Open Label Trial.." PowerPoint of discussion leader and outlines of the discussants must be posted by noon

Week 15	
Tuesday April 14, 2020	Video abstracts must be posted to the discussion board and to the assignment tool by noon
Friday – April 17, 2020	Module 16 Eduardo Rodriguez led discussion of " Tracing the fate of microplastic carbon in the aquatic food web by compound-specific isotope analysis." PowerPoint of discussion leader and outlines of the discussants must be posted by noon

Week 16	
Tuesday April 23, 2020	Celebration of graphical abstracts and video abstracts

Disclaimer: This syllabus represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.