

- Nutr Rev, 2024
- Nutrients, 2024
- Prostaglandins Leukot Essent Fatty Acids, 2024
- Brain Behav Immun, 2024
- Cell, 2025
- Brain Behav Immun, 2025
- Imeta (Metagenomics and Bioinformatics Journal), 2025
- The Journal of Clinical Endocrinology & Metabolism, 2025

- Biochim Biophys Acta Bioenerg, 2025
- J Orthop Res, 2025
- Lab Anim (NY), 2025
- Diabetes, 2021

The specific articles and the presenters are listed in the following table.

Presenter	Article #	Citation
Akshaya	Article 1	Effect of Fatty Acids on Glucose Metabolism and Type 2 Diabetes , Sivri, D. & Akdevelioglu, Y., Nutr Rev, 2024; DOI: 10.1093/nutrit/nuae165
Sitara	Article 2	Erythrocyte Membrane Fluidity and Omega-3 Fatty Acid Intake: Current Outlook and Perspectives for a Novel, Nutritionally Modifiable Cardiovascular Risk Factor , Capece, U., Gugliandolo, S., Morciano, C., Avolio, A., Splendore, A., Di Giuseppe, G., Ciccarelli, G., Soldovieri, L., Brunetti, M., Mezza, T., Pontecorvi, A., Giaccari, A. & Cinti, F., Nutrients, 2024; DOI: 10.3390/nu16244318
Akshaya	Article 3	Effect of age and dietary habits on Red Blood Cell membrane fatty acids in a Southern Europe population (Basque Country) , Marrugat, G., Cano, A., Amezaga, J., Arranz, S., Embade, N., Millet, O., Ferreri, C. & Tueros, I., Prostaglandins Leukot Essent Fatty Acids, 2024; DOI: 10.1016/j.plefa.2023.102602
Sitara	Article 4	Dietary fatty acid composition drives neuroinflammation and impaired behavior in obesity , Sanchez, C., Colson, C., Gautier, N., Noser, P., Salvi, J., Villet, M., Fleuriot, L., Peltier, C., Schlich, P., Brau, F., Sharif, A., Altintas, A., Amri, E.Z., Nahon, J.L., Blondeau, N., Benani, A., Barres, R. & Rovere, C., Brain Behav Immun, 2024; DOI: 10.1016/j.bbi.2024.01.216
Akshaya	Article 5	A beta-hydroxybutyrate shunt pathway generates anti-obesity ketone metabolites , Moya-Garzon, M.D., Wang, M., Li, V.L., Lyu, X., Wei, W., Tung, A.S., Raun, S.H., Zhao, M., Coassolo, L., Islam, H., Oliveira, B., Dai, Y., Spaas, J., Delgado-Gonzalez, A., Donoso, K., Alvarez-Buylla, A., Franco-Montalban, F., Letian, A., Ward, C.P. ... Long, J.Z., Cell, 2025; DOI: 10.1016/j.cell.2024.10.032
Sitara	Article 6	Analysis of the brain transcriptome, microbiome and metabolome in ketogenic diet and experimental stroke , Zharikova, A.A., Andrianova, N.V., Silachev, D.N., Nebogatikov, V.O., Pevzner, I.B., Makievskaya, C.I., Zorova, L.D., Maleev, G.V., Baydakova, G.V., Chistyakov, D.V., Goriainov, S.V., Sergeeva, M.G., Burakova, I.Y., Gureev, A.P., Popkov, V.A., Ustyugov, A.A. & Plotnikov, E.Y.; Brain Behav Immun, 2025; DOI: 10.1016/j.bbi.2024.10.004

Akshaya	Article 7	Time-restricted feeding mitigates Alzheimer's disease-associated cognitive impairments via a B. pseudolongum-propionic acid-FFAR3 axis , Zhao, Y., Jia, M., Ding, C., Bao, B., Li, H., Ma, J., Dong, W., Gao, R., Chen, X., Chen, J., Dai, X., Zou, Y., Hu, J., Shi, L., Liu, X. & Liu, Z., <i>Imeta</i> , 2025, DOI: 10.1002/imt2.70006
Sitara	Article 8	Navigating the Spectrum of 4 Evidence-Based Nutrition Options for Type 2 Diabetes Management , Baskin, R.G. & Karp, K.A., <i>The Journal of Clinical Endocrinology & Metabolism</i> , 2025; DOI: 10.1210/clinem/dgae646
Akshaya	Article 9	Clinical ischemia-reperfusion injury: Driven by reductive rather than oxidative stress? A narrative review , de Kok, M.J.C., Schaapherder, A.F.M., Bloeme-Ter Horst, J.R., Faro, M.L.L., de Vries, D.K., Ploeg, R.J., Bakker, J.A. & Lindeman, J.H.N., <i>Biochim Biophys Acta Bioenerg</i> , 2025, DOI: 10.1016/j.bbabbio.2025.149539
Sitara	Article 10	AMPK Signaling Pathway Regulates Tendon Regeneration via Fatty Acid Metabolism , Wu, T., Zhu, L., Yu, M., Cai, X., Chen, L., Zhang, H., Wu, X., Ding, C., Liu, H., Zhang, S., Li, C., Shi, X., Wang, Y. & Liu, Y., <i>J Orthop Res</i> , 2025; DOI: 10.1002/jor.26061
Akshaya & Sitara	Article 11	Timing of standard chow exposure determines the variability of mouse phenotypic outcomes and gut microbiota profile , Knuth, M.M., Campos, C.V., Smith, K., Hutchins, E.K., Lewis, S., York, M., Coghill, L.M., Franklin, C., MacFarlane, A.J., Ericsson, A.C., Magnuson, T. & Ideraabdullah, F., <i>Lab Anim (NY)</i> , 2025; DOI: 10.1038/s41684-024-01477-1
Akshaya & Sitara	Article 12	Developmental Timing of High-Fat Diet Exposure Impacts Glucose Homeostasis in Mice in a Sex-Specific Manner , Glavas, M.M., Lee, A.Y., Miao, I., Yang, F., Mojibian, M., O'Dwyer, S.M. & Kieffer, T.J., <i>Diabetes</i> , 2021; DOI: 10.2337/db21-0310

Feel like you may need a little background review and update on the current knowledge concerning the nutritional aspects of lipids? There are PowerPoint files on the course Canvas account about 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 textbooks you studied in biochemistry and metabolism courses. You may also want to download the following book available through the UF library:

Emerging Role of Lipids in Metabolism and Disease

Pallottini, Valentina; Pallottini, Valentina; Segatto, Marco

2021

https://mdpi-res.com/bookfiles/book/3565/Emerging_Role_of_Lipids_in_Metabolism_and_Disease.pdf?v=1703873491

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 social media. A project addressing a real-world nutrition problem addressing the Topic "Food is Medicine - The disruptive story of the role of fat in food?" 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 aspects of lipids to a current research topic facing the nutritional community.

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 recent articles which will be read by all the class before your presentations. Each article 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 – DISRUPTIVE SCIENTIFIC THINKING –

On January 5, 2023, Nature published the following paper:

Papers and patents are becoming less disruptive over time

M. Park, E. Leahey and R. J. Funk

Nature 2025 Vol. 613 Issue 7942 Pages 138-144

Accession Number: 36600070 DOI: 10.1038/s41586-022-05543-x

<https://www.ncbi.nlm.nih.gov/pubmed/36600070>

Theories of scientific and technological change view discovery and invention as endogenous processes (1,2), wherein previous accumulated knowledge enables future progress by allowing researchers to, in Newton's words, 'stand on the shoulders of giants'(3-7). Recent decades have witnessed exponential growth in the volume of new scientific and technological knowledge, thereby creating conditions that should be ripe for major advances (8,9). Yet contrary to this view, studies suggest that progress is slowing in several major fields (10,11). Here, we analyse these claims at scale across six decades, using data on 45 million papers and 3.9 million patents from six large-scale datasets, together with a new quantitative metric-the CD index (12)-that characterizes how papers and patents change networks of citations in science and technology. We find that papers and patents are increasingly less likely to break with the past in ways that push science and technology in new directions. This pattern holds universally across fields and is robust across multiple different citation- and text-based metrics (1,13-17). Subsequently, we link this decline in disruptiveness to a narrowing in the use of previous knowledge, allowing us to reconcile the patterns we observe with the 'shoulders of giants' view. We find that the observed declines are unlikely to be driven by changes in the quality of published science,

citation practices or field-specific factors. Overall, our results suggest that slowing rates of disruption may reflect a fundamental shift in the nature of science and technology.

Question – What is our disruptive scientific thinking about nutritional aspects of lipids?

In the writing below, the authors' words are in black, and my words are in blue.

Current understanding of how science moves forward:

Theories of scientific and technological change:

- **discovery** and invention = endogenous processes
- previous accumulated **knowledge** = future progress by allowing researchers to, in Newton's words, 'stand on the shoulders of giants' (confirm or somewhat extend previous ways of thinking)

What has been happening:

- Recent decades have witnessed **exponential growth in the volume of new scientific and technological knowledge**, thereby creating conditions that should be ripe for major advances.
- Yet contrary to this view, studies suggest that **progress is slowing in several major fields**.

What the authors did:

- Here, we analyse these claims at scale across six decades, using data on 45 million papers and 3.9 million patents from six large-scale datasets, together with a new quantitative metric—the CD index¹²—that characterizes how papers and patents change networks of citations in science and technology.

What the authors say they found:

We find that papers and patents are increasingly less likely to break with the past in ways that push science and technology in new directions.

- This pattern holds universally across fields and is robust across multiple different citation- and text-based metrics.
- Subsequently, we **link this decline in disruptiveness to a narrowing in the use of previous knowledge**, allowing us to reconcile the patterns we observe with the 'shoulders of giants' view. We find that the observed declines are **unlikely to be driven by changes in the quality of published science, citation practices or field-specific factors**.

Overall, our results suggest that slowing rates of disruption may reflect a **fundamental shift in the nature of science and technology**. (yikes!!!)

Wonderment -

- Wonder if we read more broadly and listened to more perspectives, our disruptive thinking about the nutritional aspects of lipids would break with the past in ways that push science and technology in new directions.

- Wonder if we focused on the short chain fatty acids and the long chain poly unsaturated fatty acids (instead of palmitate and stearate), our thinking could disrupt current approaches to push science forward.

Action Plan

Let's spend some time this semester finding out and then present our ideas concerning the topic "Food is Medicine - The disruptive story of the role of fat in food" with each student choosing a physiological or pathophysiological state and discussing throughout the semester the role of dietary lipid in that state.

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
Class Presentations	45
12 journal article notes and class participation	24
Class presentation of disruptive thinking on your chosen topic	15
Disruptive thinking conclusions concerning "Food is Medicine - The disruptive story of the role of fat in food"	16
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 2025 Course Schedule

<u>Week 1</u>	
Tuesday January 14, 2025	Course introduction and personalized planning for each student
Friday –, January 17, 2025	Wonderments / Thinking outside the box / Disruptive thinking – Plan for disruptive thinking – Led by Peggy
<u>Week 2</u>	
Tuesday January 21, 2025	Group discussion of “Food is Medicine - The disruptive story of the role of fat in food.” – Led by Peggy
Friday –, January 24, 2025	Lipid Biochemistry Review – Led by Peggy
<u>Week 3</u>	
Tuesday January 28, 2025	Lipid Biochemistry Review – Led by Peggy
Friday – January 31, 2025	Issues with lipid composition of foods in available nutrient databases – Led by Peggy
<u>Week 4</u>	
Tuesday February 04, 2025	Food As Precision Medicine – Disruptive Thinking on the role of lipids in patient care – Led by Peggy
Friday – February 07, 2025	Discussion of Class Project “Food is Medicine - The disruptive story of the role of fat in food.” What can be done now? – Led by Peggy
<u>Week 5</u>	
Tuesday February 11, 2025	Discussion of Class Project “Food is Medicine - The disruptive story of the role of fat in food.” What do I want to do? – Led by Akshaya and Sitra

Friday – February 14, 2025	Effect of Fatty Acids on Glucose Metabolism and Type 2 Diabetes, Sivri, D. & Akdevelioglu, Y., Nutr Rev, 2024; DOI: 10.1093/nutrit/nuae165 Led by Akshaya Erythrocyte Membrane Fluidity and Omega-3 Fatty Acid Intake: Current Outlook and Perspectives for a Novel, Nutritionally Modifiable Cardiovascular Risk Factor, Capece, U., Gugliandolo, S., Morciano, C., Avolio, A., Splendore, A., Di Giuseppe, G., Ciccarelli, G., Soldovieri, L., Brunetti, M., Mezza, T., Pontecorvi, A., Giaccari, A. & Cinti, F., Nutrients, 2024; DOI: 10.3390/nu16244318 Led by Sitara
<u>Week 6</u>	
Tuesday February 18, 2025	Effect of age and dietary habits on Red Blood Cell membrane fatty acids in a Southern Europe population (Basque Country), Marrugat, G., Cano, A., Amezaga, J., Arranz, S., Embade, N., Millet, O., Ferreri, C. & Tueros, I., Prostaglandins Leukot Essent Fatty Acids, 2024; DOI: 10.1016/j.plefa.2023.102602 Led by Akshaya Dietary fatty acid composition drives neuroinflammation and impaired behavior in obesity, Sanchez, C., Colson, C., Gautier, N., Noser, P., Salvi, J., Villet, M., Fleuriot, L., Peltier, C., Schlich, P., Brau, F., Sharif, A., Altintas, A., Amri, E.Z., Nahon, J.L., Blondeau, N., Benani, A., Barres, R. & Rovere, C., Brain Behav Immun, 2024; DOI: 10.1016/j.bbi.2024.01.216 Led by Sitara
Friday – February 21, 2025	Discussion of Articles 1-4 and their relevance to our class projects.
<u>Week 7</u>	
Tuesday February 25, 2025	A beta-hydroxybutyrate shunt pathway generates anti-obesity ketone metabolites, Moya-Garzon, M.D., Wang, M., Li, V.L., Lyu, X., Wei, W., Tung, A.S., Raun, S.H., Zhao, M., Coassolo, L., Islam, H., Oliveira, B., Dai, Y., Spaas, J., Delgado-Gonzalez, A., Donoso, K., Alvarez-Buylla, A., Franco-Montalban, F., Letian, A., Ward, C.P. ... Long, J.Z., Cell, 2025; DOI: 10.1016/j.cell.2024.10.032 Led by Akshaya Analysis of the brain transcriptome, microbiome and metabolome in ketogenic diet and experimental stroke, Zharikova, A.A., Andrianova, N.V., Silachev, D.N., Nebogatikov, V.O., Pevzner, I.B., Makievskaya, C.I., Zorova, L.D., Maleev, G.V., Baydakova, G.V., Chistyakov, D.V., Goriainov, S.V., Sergeeva, M.G., Burakova, I.Y., Gureev, A.P., Popkov, V.A., Ustyugov, A.A. & Plotnikov, E.Y.; Brain Behav Immun, 2025; DOI: 10.1016/j.bbi.2024.10.004 Led by Sitara
Friday – February 28, 2025	Discussion of Articles 5-6 and their relevance to our class projects.
<u>Week 8</u>	

Tuesday March 04, 2025	Time-restricted feeding mitigates Alzheimer's disease-associated cognitive impairments via a B. pseudolongum-propionic acid-FFAR3 axis, Zhao, Y., Jia, M., Ding, C., Bao, B., Li, H., Ma, J., Dong, W., Gao, R., Chen, X., Chen, J., Dai, X., Zou, Y., Hu, J., Shi, L., Liu, X. & Liu, Z., Imeta, 2025, DOI: 10.1002/imt2.70006 Led by Akshaya Navigating the Spectrum of 4 Evidence-Based Nutrition Options for Type 2 Diabetes Management, Baskin, R.G. & Karp, K.A., The Journal of Clinical Endocrinology & Metabolism, 2025; DOI: 10.1210/clinem/dgae646 Led by Sitara
Friday – March 07, 2025	Discussion of Articles 7-8 and their relevance to our class projects.
<u>Week 9</u>	
Tuesday March 11, 2025	Clinical ischemia-reperfusion injury: Driven by reductive rather than oxidative stress? A narrative review, de Kok, M.J.C., Schaapherder, A.F.M., Bloeme-Ter Horst, J.R., Faro, M.L.L., de Vries, D.K., Ploeg, R.J., Bakker, J.A. & Lindeman, J.H.N., Biochim Biophys Acta Bioenerg, 2025, DOI: 10.1016/j.bbabbio.2025.149539 Led by Akshaya AMPK Signaling Pathway Regulates Tendon Regeneration via Fatty Acid Metabolism, Wu, T., Zhu, L., Yu, M., Cai, X., Chen, L., Zhang, H., Wu, X., Ding, C., Liu, H., Zhang, S., Li, C., Shi, X., Wang, Y. & Liu, Y., J Orthop Res, 2025; DOI: 10.1002/jor.26061 Led by Sitara
Friday – March 14, 2025	Discussion of Articles 9-10 and their relevance to our class projects.
<u>Week 10</u>	
March 18-21, 2025	Have a great Spring Break!!
<u>Week 11</u>	
Tuesday March 25, 2025	Proposal for improving issues with lipid composition of foods in available nutrient databases (Part 1)– Led by Peggy
Friday - March 28, 2025	Proposal for improving issues with lipid composition of foods in available nutrient databases (Part2)– Led by Peggy
<u>Week 12</u>	

Tuesday April 01, 2025	Proposal for improving issues with lipid composition of foods in available nutrient databases (Part 3)– Led by Akshaya and Sitara
Friday – April 04, 2025	Timing of standard chow exposure determines the variability of mouse phenotypic outcomes and gut microbiota profile , Knuth, M.M., Campos, C.V., Smith, K., Hutchins, E.K., Lewis, S., York, M., Coghill, L.M., Franklin, C., MacFarlane, A.J., Ericsson, A.C., Magnuson, T. & Ideraabdullah, F., Lab Anim (NY), 2025; DOI: 10.1038/s41684-024-01477-1 Led by Akshaya and Sitara
<u>Week 13</u>	
Tuesday April 08, 2025	Discussion of Article 11 and its relevance to our class projects.
Friday – April 11, 2025	Discussion of Class Projects
<u>Week 14</u>	
Tuesday April 09, 2025	Developmental Timing of High-Fat Diet Exposure Impacts Glucose Homeostasis in Mice in a Sex-Specific Manner , Glavas, M.M., Lee, A.Y., Miao, I., Yang, F., Mojibian, M., O'Dwyer, S.M. & Kieffer, T.J., Diabetes, 2021;DOI: 10.2337/db21-0310 Led by Akshaya and Sitara
Friday – April 11, 2025	Discussion of Article 12 and its relevance to our class projects.
<u>Week 15</u>	
Tuesday April 15, 2025	Discussion of Class Projects and reflection on the next steps to be taken in the disruptive story of the role of fat in food.
Friday – April 18, 2025	Discussion of the role of fat in food in our own research.
<u>Week 16</u>	
Tuesday April 22, 2025	Celebration of Disruptive Thinking (Presentation of class projects)
Have a fantastic Summer 2025	

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.