Foodomics – What is in the Food We Eat and Use to Treat Patients?
ALS4932 (31714)
Time: Tuesday First Period (7:25-8:15AM) Location: zoom Synchronous Meeting
Optional Foodomics Research Chat Sunday at 4:00 PM each week
Data collection, data entry, data auditing, data analysis on your own each week
Spring 2022

Instructor

Peggy R. Borum, PhD prb@ufl.edu (352) 562-2861 (personal mobile number)
Office Hours: Available by appointment via Microsoft Teams

Undergraduate Innovator

Please contact through the Canvas website or Class Microsoft Team
Raymond "Mitch" Faloona, rfaloona@ufl.edu
Office hours: Available by appointment via Microsoft Teams

Course Overview

Hippocrates said, "Let food be thy medicine" and since July 27, 1921, ketogenic diet has been used to treat seizures. The recent practice of precision medicine has emphasized the need to know the chemical composition of food. This course will include several steps that make the needed composition of food found in Florida available for the treatment of patients with refractory epilepsy. Students will collect composition data from food in Florida markets, prepare databases designed to use that data in recipes consistent with patients' diet prescriptions, address specific questions concerning Precision Ketogenic Therapy, and draft potential research projects to be conducted in the future.

Reasons for the Course Activities

Research is exciting. Learning something that no one has ever known can be the highest of all highs. Basic research questions are very stimulating and extremely important. Translational science research questions can be very satisfying when you realize you have helped someone who had no answer. This type of research also brings a great deal of responsibility because someone with no answer is depending on you. When in this position it is important to remember that you should do unto others as you would have them do unto you. When you realize that the person with no answer could be you, the repetitive tasks that require great attention to detail cannot become boring or something that one just tries to get done as quickly as possible.

For our spring 2022 class, the people with no answers are those who have a diagnosis of epilepsy, and no treatment has helped but has brought adverse side effects. The therapy that we are studying is Precision Ketogenic Therapy (PKT) that alters the diet to reduce carbohydrate intake to very low concentrations and fills in the calories that have been removed with fat calories. Since this is a therapy, it is important that we know exactly what and how much we are administering. Food has not routinely been used in such a way and as a result the composition of food has not received as much chemical composition analyses as we would like to have.

We take advantage of the fact that the United States labeling laws require many foods to be analyzed for a fairly short list of ingredients. However, there is not a database available to us that gives us these data

to use in treatment of patients. We term these needed data "foodomics" because the goal is to know the identity and amount of each chemical in the food. Our laboratory has been gathering information about values from Nutrition Facts Labels for several years and have found that the composition of foods changes more rapidly than we expected. If we want to utilize nutrients to help control seizures, it is important that we know the chemical identity and the quantity of all the nutrients in the food the patient is consuming now. If we only have these data from a few years ago or months ago and the composition of the food has changed, we think we are administering a therapy at a certain dose when in reality we do not know what dose we are administrating. Thus, a frequently updated Foodomics Database is essential in trying to help these patients who have no answer.

Course Research Objectives and Activities

In this course, you will collect data on specific brands of food in food stores and enter the data into our Foodomics Database used to treat patients. You will be among the pioneers of foodomics enabling its use in patient care. You will create a current Foodomics Database and prepare a proposal to integrate two new United States Department of Agriculture food databases in addition to the USDA Legacy SR database into our Foodomics Database. As a group, the class will prepare an abstract and present the poster at the Undergraduate Research Symposium. You will prepare and present a Potential PKT Foodomics Research Project with the option of continuing to work on it in the following semesters.

Course Education Objectives and Outcomes

Content: Students will demonstrate competence in the concepts of use of nutrients to treat and prevent disease. These will include understanding of Precision Ketogenic Therapy, advantages and limitations of current nutrient databases, and translational science in theory as well as practice.

Research Skills and Critical Thinking: Students will hone skills of data collection, data wrangling, database creation, database utilization to meet specific patient needs, and creation of potential research projects using the data collected.

Collaborative and Teamwork Skills: Students will learn and use Microsoft Teams software to collaborate with their colleagues and organize data. Since Microsoft Teams software has been adopted by many Fortune 500 companies and educational organizations including the University of Florida, competency in its use will be desirable when applying for future internships, education opportunities, and professional positions. The class will work collaboratively as a single team of 15 members, 3 teams of 5, and 15 individual researchers.

Communication with Peers and Scientific Community: Students will present their research progress to each other, to the instructor, and to the research community in both written and oral formats.

Course Responsibilities

Individual Responsibilities

- Individual work reports in OneNote
- Data collection and data entry into the Foodomics Database of your Research Team
- Wrangling of your research team's data entered into the Foodomics Database of your Research Team
- Proposal for improve integration of USDA food composition databases
- Creation and presentation of a Potential PKT Foodomics Research Project

Research Team Responsibilities

- Collaborative plan and execution of that plan to have data collected, entered, and wrangled on time.
- Collaborative creation and posting of report of your research team's research progress.

- Review of your research team's proposal for improving use of USDA databases
- Review of your research partner's Potential PKT Foodomics Research Project

Entire Class Responsibilities

- Contribute to the creation and review of the Undergraduate Research Symposium abstract and poster

TimeLine

- Data Collection and Creation of Foodomics Database- Weeks 1-6
- Undergraduate Research Symposium Abstract, Poster Presentation, and Proposal for USDA Databases integration – Weeks 7-12
- Creation of Potential PKT Research Project with the option of implementing the research in a following semester - Weeks 13-15

Recommended Materials

Recommended material will be posted to the Foodomics Class Spring 2022 site.

Evaluation of Grades

Assignment	Total Points	Percent of Grade
Data Collection	500	50%
Preparation of database and proposal for integration of USDA databases	200	20%
Abstract, Poster, and Presentation	100	10%
Individual Project Proposal	200	20%
TOTAL	1000	100%

Grading Scale

Score	Percent	Grade	Grade Points
934-1000	93.4-100	A	4.00
900-933	90.0-93.3	A-	3.67
867-899	86.7-89.9	B+	3.33
834-866	83.4-86.6	B	3.00
800-833	80.0-83.3	B-	2.67
767-799	76.7-79.9	C+	2.33
734-766	73.4-76.6	C	2.00
700-733	70.0-73.3	C-	1.67
667-699	66.7-69.9	D+	1.33
634-666	63.4-66.6	D	1.00
600-633	60.0-63.3	D-	0.67
0-599	0-599	E	0.00

More information on grades and grading policies is here:

https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Class Attendance and Make-Up Policy

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/.

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/ . It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at gatorevals.aa.ufl.edu/public-results/ .

Class Demeanor

Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Materials and Supplies Fees

There are no additional fees for this course.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct- honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Counseling and Wellness Center

Contact information for the Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc/Default.aspx, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Course Schedule

Zoom Link for Tuesday Class Meeting at 7:25AM:
https://ufl.zoom.us/j/99193834017?pwd=NDkzZkRocFRuZ3VXVDg4MkJIbDIwQT09

Zoom Link for Sunday Optional Foodomics Research Chat at 4:00PM:
https://ufl.zoom.us/j/93077750407?pwd=TElTb3dVTys2dWRnbzJuT0Z1bVJSQT09

Date and Time	Activity
Tuesday, 01/11/2022 7:25 AM	• Introduction to Microsoft Teams • Precision Ketogenic Therapy • Nutrient Composition of Food • Foodomics
Sunday, 01/16/2022 4:00 PM	Optional Foodomics Research Chat
Tuesday, 01/18/2022 7:25 AM	• Review of results of first food runs • Discussion of Research Progress • Discussion of Website Content Writing
Sunday, 01/23/2022 4:00 PM	Optional Foodomics Research Chat
Tuesday, 01/25/2022 7:25 AM	• Review of results of second food runs • Discussion of Research Progress • Discussion of how we will use our data
Sunday, 01/30/2022 4:00 PM	Optional Foodomics Research Chat
Tuesday, 02/01/2022 7:25 AM	Dr. Parrish Winesett, Pediatric Neurologist visit
Sunday, 02/06/2022 4:00 PM	Optional Foodomics Research Chat
Tuesday, 02/08/2022 7:25 AM	• Discuss FoodData Central Manuscript
Sunday, 02/13/2022 4:00 PM	• Optional Foodomics Research Chat
Tuesday, 02/15/2022 7:25 AM	• Discuss Foundation Foods Database
Sunday, 02/20/2022 4:00 PM	Optional Foodomics Research Chat
Tuesday, 02/22/2022 7:25 AM	• Discuss Branded Foods Database
Sunday, 02/27/2022 4:00 PM	Optional Foodomics Research Chat
Tuesday, 03/01/2022 7:25 AM	• Discuss Dietary Supplement Labels Database
Sunday, 03/06/2022	Optional Foodomics Research Chat

4:00 PM	
03/7-13/2022	**Have a Fun and Safe Spring Break!!!**
Tuesday, 03/15/2022 7:25 AM	• Compare and Contrast Foodomics Database and Foundation Foods Database
Sunday, 03/20/2022 4:00 PM	Optional Foodomics Research Chat
Tuesday, 03/22/2022 7:25 AM	• Compare and Contrast Foodomics Database and Branded Foods Database
Sunday, 03/27/2022 4:00 PM	Optional Foodomics Research Chat
Tuesday, 03/29/2022 7:25 AM	• Compare and Contrast Foodomics Database and Dietary Supplement Labels Database
Sunday, 04/03/2022 4:00 PM	Optional Foodomics Research Chat
Tuesday, 04/05/2022 7:25 AM	• Can the Foundation Foods Database be used to reduce the need to collect foodomics data from local stores or the SR Legacy Database? • Can the Branded Foods Database be used to reduce the need to collect foodomics data from local stores or the SR Legacy Database? • Can the Dietary Supplement Labels Database be used to reduce the need to collect foodomics data from local stores or the internet?
Sunday, 04/10/2022 4:00 PM	Optional Foodomics Research Chat
Tuesday, 04/12/2022 7:25 AM	• Discussion of Potential Precision Ketogenic Therapy Foodomics research projects of each individual student and the target group for the project
Sunday, 04/17/2022 4:00 PM	Optional Foodomics Research Chat
Tuesday, 04/19/2022 7:25 AM	• Discussion of Potential Precision Ketogenic Therapy Foodomics research projects of each individual student and the target group for the project