

**SIGN UP FOR THIS CLASS****A Half-Semester Biology Lab Experience****Biology 3960 (Section 8)****Stable Isotopes: You Are What You Eat (Your mother was right)****(1 unit elective)**

**Overview:** Enter the world of stable isotopes. Here chemistry from your diet and metabolism are recorded naturally in breath, hair, teeth, and bones. In this fresher seminar, students will get lab experience along with discussions on how stable isotopes are used in health, ecology, evolution, and physiology.

**Instructor:** Jim EhleringerEmail: [jim.ehleringer@utah.edu](mailto:jim.ehleringer@utah.edu)

Office; 522 ASB, Phone: 801-581-7623

Office hours by appointment

**Class meets:** Thursdays, 4:35-5:55 pm, 504 ASB (October 22 – December 10)

<b>Date</b>	<b>Topic</b>	<b>Lab activity</b>
Oct 22	Carbon isotopes and breath – your carbohydrate metabolism; introduction to C3/C4 photosynthesis	Visit SIRFER; collect and analyze student breath samples
Oct 29	How are carbon isotopes used to reconstruct human diets today, animal diets, as well those of early hominids	Interpret student breath results
Nov 5	Carbon and nitrogen isotopes and hair – your protein metabolism; introduction to trophic levels and diets	Collect and analyze student hair samples
Nov 12	How are hair isotopes used in anthropology, biology, ecology, and forensics today?	Interpret hair sample results
Nov 19	Where did your beverages and waters really come from? An introduction to spatial isoscapes	Joint project to analyze beverage and water samples from students
Dec 3	Food fraud – use isotopes to authenticate origins and quality of the foods and beverages you eat every day	Joint project to analyze foods selected by students
Dec 10	Learning how to present your data results effectively to friends and colleagues	Create a poster to be presented at the Fresher Science Gathering

**Readings (provided as PDF files):**

- Ehleringer, J.R. and T.E. Cerling. 2001. Stable isotopes, p. 544-550. In H.A. Mooney and J. Canadell (eds.), *Encyclopedia of Global Environmental Change*, John Wiley and Sons, London
- Ehleringer, J.R., L.A. Chesson, L.O. Valenzuela, B.J. Tipple, and L.A. Martinelli. 2015. Stable isotopes trace the truth: from adulterated foods to crime scenes. *Elements* 11:259-264.
- Chesson, L.A., B.J. Tipple, J.D. Howa, G.J. Bowen, J.E. Barnette, T.E. Cerling, and J.R. Ehleringer. 2014. Stable isotopes in forensic applications. In H.D. Holland and K.K. Turekian (eds.), *Treatise of Geochemistry*, Second Edition, vol. 14, pages 285-317. Oxford, London.
- Valenzuela, L.O., L.A. Chesson, G.J. Bowen, T.E. Cerling, and J.R. Ehleringer. 2012. Dietary heterogeneity among western industrialized countries reflected in the stable isotope ratios of human hair. *PLoS ONE* 7(3):e34234. doi:10.1371/journal.pone.0034234.

**Grading:** There are no exams in this course. Your grade will be based on weekly engagement and classroom participation. All work in this course will be collaborative and all products produced will be the joint responsibility of all participants. All students must be able to explain results to Mom.

**Content accommodation:** No content accommodation will be made in this course.

**Americans with Disabilities Act (ADA):** The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice must be given to the instructor and to the Center for Disability Services. Call or visit: <http://disability.utah.edu>, 162 Olpin Union Bldg, 581-5020 (V/TDD) for arrangements.

# You are what you eat (isotopically)

BIOL 3960-008



*Fall Semester  
Thursdays, 4:30 - 6:00  
Oct 22 – Dec 10  
1 unit elective credit*



*A hands-on, lab introduction  
to human diets and nature's  
stable isotope tracers*