**DAY 33: Wed Nov 12** Stable isotopes in mammalian research

1. **10:00-10:08 Business—**
   1. tonight by 11pm submit any edits to your background that you want me to see
   2. Next Monday, your project description is due, describe handout
   3. For Friday, you will do a message box, take a blank one from your folder
      1. Make sure to mention the data collection and the type of analysis. For the red-legged frog, I was looking for comparison of mean values of GIS factors for frog present/absent sites, Χ2 test of variables; logistic regression
      2. Again: previous work is establishing what was known that led to this study, not WHO did it
      3. Try to keep the major research findings simple
2. 10:08-10:16 individual; 10:16-30 Pop Quiz🡪questions to ask them to answer individually, then as a team write the answers up on the board🡪I’ve moved this to an earlier date for next year
   1. What is a natural abundance versus enriched stable isotope study? (they did well with this)
   2. Make a graph that compares the amount of substrate on the x axis with the proportion of heavy isotope in the animal/tissue
   3. Make a graph that compares the amount of substrate on the x axis with the amount of discrimination against the heavy isotope
3. **~~10:08-10:15 Activity 1:~~** ~~Put up on your board—just which of the bullets are not repeated and a list of new ideas.~~
4. **10:42** **Activity 2:** They will list the figures on their board and point out which bullet the figures demonstrate (we didn’t get through this, next year, maybe give them a bulleted list and they have to find the meaning of the figure, or just ask them to describe the figure?)
   1. Table 2—variation within tissues;
   2. ~~Figure 3—effects of physiological, biochemical and behavioral processes on stable isotope ratios (too complicated)~~
   3. Figure 4—how to verify signature of diet items is unique
   4. Fig 5—effects of atmospheric CO2 over time
   5. Fig 6—using enriched stable isotopes, you can investigate metabolic rates
5. **10:40-10:50** discuss answers, grade each other
6. Paper for next time, do a message box.
7. **Before you go, on the blue quarter sheets, Yes, no, or not sure**
   1. *I understand how 13C reflects primary production and 15N reflects trophic level.*
   2. *I understand that other factors can alter stable isotope values and need to be accounted for.*
   3. *The activity (ies) today increased my understanding of stable isotope analysis*
   4. *I’m ready to move on to the Cave Bear paper for Monday*

**THEIR PREP:**

**READ:** Ben-David, Merav, and Elizabeth A. Flaherty. "Stable isotopes in mammalian research: a beginner's guide." *Journal of mammalogy* 93.2 (2012): 312-328.

Used the bulleted list and added to it

**MY PREP:**

* Team folders
  + Blank Message Box for each student
  + Printout of the Bulleted list for each team
  + Project Description Handout
  + Graded message boxes

TEST QUESTION

Give them a multiple choice showing one of the figures from the mammalian paper for today and ask them what issue/resolution the figure demonstrates

Then, follow up with the short answer, what do you do to fix the problem or account for it (like within-tissue heterogeneity, you sample the same tissue several times)