Case 11: Why is Everything Estrogenic

Session Objectives

Students will be able to:

- Describe the diverse physiologic roles of estrogen, and the diversity of estrogenic substances
- Discuss the special approaches to asking historical scientific questions
- Outline some hypotheses for the presence of estrogenic substances in many plants
- Connect these theoretical ideas to some practical issues—medicinal foods and endocrine disruption in agriculture
- Summarize the results of a research article

This lesson will start by having students examine a paper describing a surprising research result. Read the headline to them and then have them look at the paper to give a 3 sentence summary of what it describes. Discuss the implications.

What do you think of these news headlines?

Pesticides Block Crops' Natural Nitrogen Production

Estrogen mimics confuse bacteria-legume conversation

Scan the original article to see what is happening. Boil it down to a 3 sentence summary to share with the group

Give the students 5 minutes or so to complete this task. Strongly enforce the goal to be concise. Have a few volunteers share, and then discuss the paper.

A short presentation will lead students through some ideas, and help them to answer the questions below:

List a few of the many diverse examples of chemicals or conditions that can cause estrogenic responses

List a few of the many diverse examples of physiological/behavioral events controlled by estrogen

Why are "why" questions difficult for science to address? When do they come up? How can these topics be approached in a scientific manner?

What is the evolutionary pattern of organisms producing estrogenic chemicals?

What is the difference between analogous and homologous characters? Use some examples in your explanation.

Are phytoestrogens and estrogens analogous or homologous? Explain how this could be answered.

Why are plants producing these chemicals which act as estrogens?

Outline how legume roots and rhizobial bacteria communicate, and why EDC's disrupt this communication.

What implications do these ideas have for medicine?

What implications do these ideas have for agriculture?
Case Assignment

Each student will be assigned one of the questions above to embellish into a complete answer.

References


