

Peanut Allergens Learning Materials

Overview

University of Florida researchers are studying the proteins in peanuts in order to determine why many humans are allergic to them. The research team hopes to develop a hypoallergenic peanut.

Materials Needed

1. Video: Dirty is the New Clean (2 minutes)
2. Video: Peanut of the Future (2 minutes)
3. Video: Pegs and Pods (2.5 minutes)
4. News story: Glorious Goobers & Growing Up...From the Bottom
5. Peanut Allergy Exerpts (attached)
6. Peanut Allergen Crossword Puzzel (attached)
7. Prop box (optional)



Related Resources

- Young, M. C. (2006). The peanut allergy answer book. (2nd ed.). Fair Winds Press.
ISBN #: 1592332331
- Dr. Gallo's Genetics Notes
<http://agr3303c.ifas.ufl.edu/>
- University of Florida News – Allergy Free Protein
<http://news.ufl.edu/2006/12/04/peanuts/>

Interest approach

Peanut Allergy Blog Discussion

Start with the statement “Approximately four million Americans have a peanut allergy.” Have students read Peanut Allergy Blog Excerpts (attached) and think about how peanuts can affect those with peanut allergies. Ask the students the following questions (answers follow in parenthesis): How many peanuts or how much of a peanut product did these individuals have to consume to cause a reaction? (very little) What were some of the symptoms these individuals experienced? (itchy throat, vomiting, hives, wheezing, swollen throat, redness, coughing, fatigue, and sweating) “Peanut allergies cause discomfort in some cases, but in serious cases they can even cause death. The only prevention of peanut allergies is to avoid peanut products.” Have students brainstorm items to avoid. (peanuts, peanut butter, baked goods, asian foods, vegetarian foods, peanut oil or anything cooked in peanut oil, cereals, ice creams, mixed nuts, soups, natural flavorings, egg rolls, sauces, granola and energy bars.) “How do you think science can help people with peanut allergies?” Allow students to brainstorm and then use their ideas to transition into the lesson.) “To better understand allergies, scientists have to first understand where they come from, in this case the peanut.”

Discussion Questions

Video: Dirty is the New Clean

1. Develop your own hypotheses which would explain why some people are allergic to certain foods and others are not. Defend your statements.

Video: Peanut of the Future

1. Describe the two goals of this research.

Video: Pegs and Pods

1. Compare and contrast the development of a peanut and other fruits.
2. How does the differences in the growth of the peanut explain the form of the peanut?

News story: Glorious Goobers

1. Should scientists create a hypoallergenic peanut? Why?

Quiz Questions

Video: Dirty is the New Clean

1. What do people have allergic reactions to in peanuts?
Answer: People have allergic reactions to proteins in the peanut seed.
2. How many proteins in the peanut are allergenic?
 - a. 1
 - b. 3
 - c. 5
 - d. 9

Answer: b. 3

Video: Peanut of the Future

1. What is anaphylaxis?
Answer: Anaphylaxis is an overall body allergic reaction.
2. What is the worst food allergy?
Answer: Peanuts

Video: Pegs and Pods

1. True or False: Peanuts are not actually a nut.
Answer: True. Peanuts are actually legumes.
2. What is another name for a peanut?
Answer: Groundnut

News story: Glorious Goobers

1. Food allergens account for what percentage of emergency room visits for anaphylaxis?
 - a. 10%
 - b. 25%
 - c. 50%
 - d. 80%

Answer: c. 50%

2. What regions of the protein are recognized by an allergic individual's immune system as a foreign invader?
- Allergens
 - Epitopes
 - Histamines
 - IgE antibodies
- Answer:* b. Epitopes

Activities

Crossword Puzzle

Supplies: Crossword Puzzle (attached), pen or pencil

Directions: Have students read the two news articles provided on the STEP website: "Glorious Goobers" and "Growing UP...From the Bottom". After reading the articles and taking the notes from class the students should be able to complete the attached Peanut Allergen Crossword Puzzle.

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Supplies: Paper and pencil, access to resources (optional)

Directions: Have each student think of 3-5 'why' questions they have from the videos, news articles, and lesson. Have students take turns asking questions to the class. Classmates should help answer the questions. If the questions can not be answered, post them on the board. After all questions have been answered, return to the posted questions. Give students clues that lead to the correct answer or answers or challenge students to find the answers to these questions as an assignment. Make sure students understand that there may be more than one good answer or sometimes there isn't an appropriate answer.

Story Time

Supplies: paper and pen or computer, prop box (optional)

Directions: Have students create fictional storybook characters that represent the key concepts from the videos, news story, and lesson. Have them create a story that includes these characters and explains the concepts presented.

Modification: Allow students to use items from the propbox or make their own props to act out their stories.

FCAT Writing Prompt

Video: *Dirty is the New Clean*

Writing to Explain

- Write an essay in the format of a news article that explains the hygienic hypothesis.

Video: *Peanut of the Future*

Writing to Explain

- Write an essay to explain why research on peanut allergens is important.

Video: *Pegs and Pods*

Writing to Persuade

- Write a persuasive essay to convince others that a peanut is not a nut.

News Story: *Mammoth Mouse*

Writing to Explain

- Write an essay explaining the purpose of this research.

Developed and edited by:

Anna Warner, Education Specialist

Lisa Hightower, STEP Coordinator

Dr. Maria Gallo

The Scientific Thinking and Educational Partnership (STEP) program at the University of Florida strives to make cutting-edge genetics research conducted at the University accessible to middle school and high school students through educational materials. The goal of the STEP program is to interest students in science to create a more scientifically-literate public and encourage students to enter into scientific careers. For more information on the STEP program visit <http://step.ufl.edu>. To review additional educational materials on genetics produced by the STEP production team visit <http://ufgenetics.com>.

Peanut Allergy Blog Excerpts

Retrieved November 11, 2007, from www.peanutallergy.com

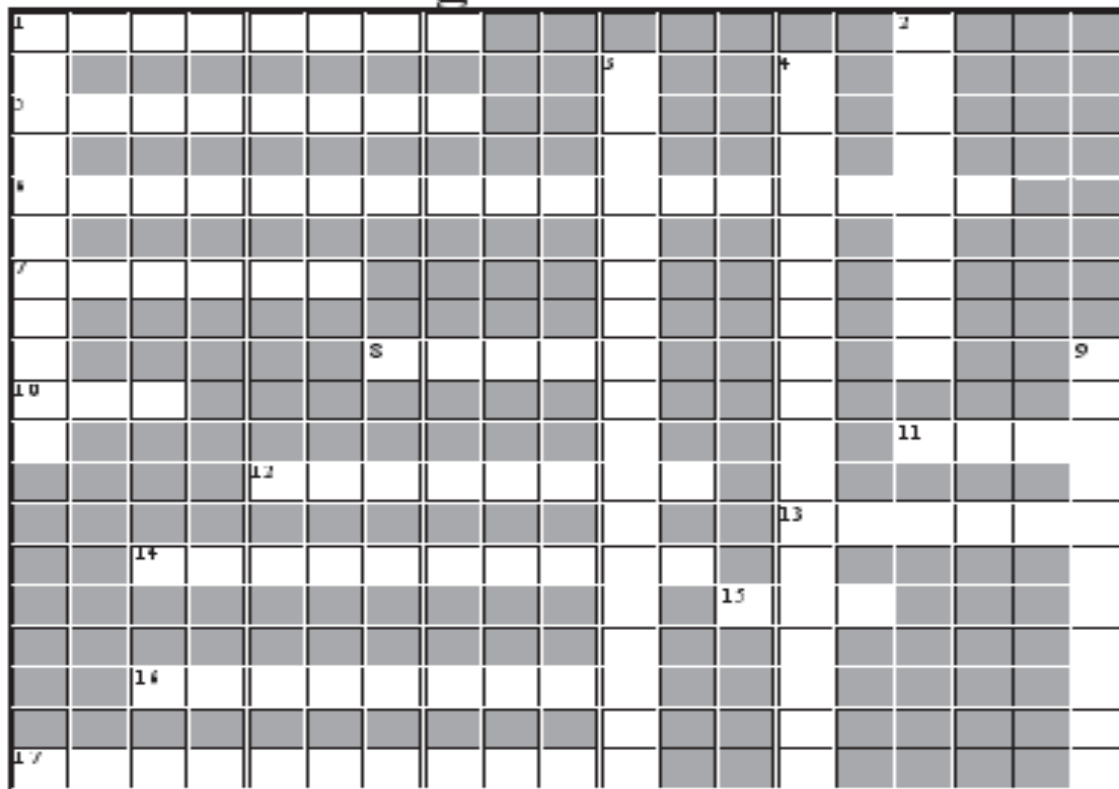
Posted: 9/9/07 I know allergic reactions manifest in different ways but as an allergy sufferer myself, my 5 yr old son's reaction is not something I am very familiar with. He ate a cookie at a school party that turned out to be a peanut butter cookie. His teacher notified me immediately and I watched him closely. He complained with an itchy throat. An hour later he began vomiting and broke out in hives. He has asthma but the peanut reaction did not trigger an attack. I gave him Benadryl and 12 hours later he began vomiting again. He also had a slight temperature.

Posted: 11/6/07 My daughter's first and only time had a reaction was at ten months. She had a tiny bit on her finger (that she stuck in my sandwich). Within a minute she was very irritable (thought she was tired) my husband called me in to the bathroom (thought a warm bath might soothe her) she was beet red from head to toe and swelling. Quickly dried her and tried to give her a bottle and she started wheezing and refused bottle. Called 911 and went to ER where they gave her Benadryl and steroids. Diagnosed officially at one year. However a mom in the ER came over and asked me if she had ate anything with peanuts as her son reacted the same way. Bless her heart, this is how we figured it out right away until her official diagnosis.

Posted: 11/6/07 When my son was about 9 months old his cousin was diagnosed with nut allergy. At the time, I read the American Pediatrics Guidelines and it said to wait on Nuts until 3yrs. I was very very careful that my son didn't get have any nuts or nut products although he ate a few may contains items like plain M&M's. Just after he turned 3 I decided to let him try the tiniest bit of PB on the end of a baby spoon. With in 1-2 minutes he started coughing and then was vomiting over and over. ...We also had a cross contamination reaction about a month later to Bakery bread. Full Body hives that time - took him to the ER just to be safe. I have learned a lot since then and we don't do bakeries or may contains.

Posted: 11/11/07 I was eating choc covered peanuts just after Halloween and my curious two year old wanted to try, we knew kids could be allergic , so we decided to give it watch and see , that way we would know, she ate the smallest one ,very tiny, as soon as it was down her throat she started to stick her hand down her throat and scrape her tongue , trying to make herself gag, it was an instantaneous reaction, no delay , I called 911 immediately as I knew people could die from peanut allergies, by the time they arrived about 7 minutes the reaction was calming down, paramedics assessed her, took her blood pressure and said she didn't need any treatment she wasn't showing any symptoms any more, I now think we should have gone to the hospital just to observe her incase the reaction returned.Her reaction symptoms consisted of itchy throat, hives around mouth, and fatigue, sweating, she tried to go up the stairs and could do it from exhaustion.

Peanut Allergen Crossword Puzzle



A CROSS

1. A substance which causes an allergic reaction.
5. Which department at the University of Florida is studying peanut allergies?
6. The cleaner your environment is growing up, the more likely you are to develop allergies.
7. A peanut is classified as a _____.
8. How many major proteins in the peanut cause allergic reactions?
10. What type of antibodies are released to signal the body to produce histamines?
11. How many million Americans suffer from peanut allergies?
12. Regions on proteins that are recognized by a person's immune system.
13. A symptom of an allergic reaction.
14. An organism with four copies of each chromosome is a _____.

15. Part of the peanut that contains the fertilized ovules and grows into the ground.

16. Product produced by the body in response to an allergen.

17. In what area of the U.S. are peanuts usually grown?

DOWN

1. A severe allergic reaction.
2. A product that is grown and harvested under human control.
3. Maybe available in the next 5 to 20 years.
4. Possible way to alter the peanut's genetic structure in order to make it hypoallergenic.
9. Researchers screen the peanuts to find _____.