**DNA From an Onion** **Primary Audience:**

**Description:** Students will extract onion DNA and discuss genetic engineering of plants.

**Keywords:** DNA, DNA extraction

**Concepts:**

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**Materials:**

- ½ cup of water
- ¼ tsp non-iodized salt
- 3 drops of liquid dish detergent
- ½ tsp meat tenderizer
- 1/3 cup rubbing alcohol (chilled in freezer)
- Half a medium-sized onion, sectioned
- Cheesecloth or similar fabric

**Instructions:**

Disposal: If you choose to dispose of the experiment, check with your local wastewater treatment facility to determine if the alcohol can be disposed of down the drain. If not, simply let the jar sit out with the lid off. Over time the liquid will evaporate leaving the onion juice in the jar, which can be discarded in the trash. All other materials can be discarded in the trash.

1. Mix the salt, detergent and tenderizer with water.
2. Add the solution to the onion sections in a blender or food processor. Pulse blender/processor to make onion pulp (using about 15 pulses).
3. Pour the pulp through the cheesecloth fabric that is stretched over a glass; squeeze slightly when through. Remove cloth and its contents and discard in the trash.
4. Spoon any soap foam from the remaining liquid in the glass and discard in the trash.
5. Lean the glass over and slowly pour the rubbing alcohol down the inside of the glass so the alcohol floats on the filtered onion juice; stir gently.
6. White strands of onion DNA will appear in the alcohol layer. Use a fork to remove the DNA (which looks like a glob of egg white) from the solution.

**Possible Interactive Questions:**

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**What's Going On?**

DNA stands for deoxyribonucleic acid. It is the chemical in all the body's cells that contains the genetic information a cell needs to survive and reproduce. It is also a long polymer made up of individual subunit chemicals. Normally in it stays locked in the nucleus of the cells. By adding detergent, salt and tenderizer we can break open the cell membrane and the nucleus as well, spilling the DNA into the onion pulp. After filtering, we can use rubbing alcohol to make the DNA "gel" together so we can remove it from the onion juice.

**Further Exploration:**

1. With the increasing ability of genetic engineering, useful plants are now being created that are resistant to draught and insect invaders. Some food plants are also being considered for genetic modification. "DNA for Dinner?" is a web based activity that explores the science and ramifications of genetically modified food. It's web address is http://www.gis.net/~peacewp/webquest.htm#Task

**Relevant Ohio Science Content Standards: Life Science:** 10.1, 10.28