

# Create a DNA protocol

*What elements are necessary to remove DNA from a cell and in what quantities? What skills are necessary to be a successful group member?*

Protocols are procedures that are established and adopted by a lab or group of labs in order to produce quality results that can be replicated by others. Protocols are detailed step-by-step instructions to ensure that scientists are doing all the actions necessary to get accurate results. Different labs testing for the same disease may use different protocols based on the equipment and resources available. Protocols are constantly updated based on new technology and/or scientific discoveries.

Extraction of DNA is possible using common materials. In this lab, you will be creating your own protocol for extracting DNA. However, you will be grouped with other scientists who are part of your team. This exercise will be considered a portion of an interview for a job as a lab technician.

## Materials

- DNA extraction cards
- Small quantities of substances described on the DNA extraction cards: vinegar, sugar, pineapple juice, dishwashing liquid, water, salt, oil, baking soda, meat tenderizer, ethanol or isopropyl alcohol
- Filter paper or cheese cloth
- Test tubes or centrifuge tubes
- Test tube rack
- Small cups
- Plant-based food (strawberries, kiwi, or similar)
- Sealable plastic bag
- Funnels
- Wooden splints/tweezers

## Procedure

1. Think about the skills necessary to do well in an interview. Write at least two skills or characteristics that would help you be a successful candidate for a job. Share your ideas with a classmate. Share your ideas with your group.
2. Review cell parts and where DNA is located within the cell. What structures will need to be broken down to reach the DNA? What materials on the cards will help you to break down those structures?
3. Collaborate with your group members to create a protocol to extract DNA.
4. Record the materials used, the amounts used, and the sequence of the steps as well as who completed them. When your protocol is complete, fill out the blank SOP form below.
5. Determine if you were successful by observing your final product.
6. Repeat the process with changes if necessary.
7. Be prepared to share your process and results with other lab groups during the next class session.

## Assesment

Complete the following exit ticket evaluating your group and yourself at the end of class.

|                                                                                |                     |                  |                  |
|--------------------------------------------------------------------------------|---------------------|------------------|------------------|
| Everyone had a chance to participate equally in our discussion.                | <i>No</i>           | <i>Sometimes</i> | <i>Yes</i>       |
| Everyone is listening to contributions.                                        | <i>No</i>           | <i>Sometimes</i> | <i>Yes</i>       |
| Someone in the group is taking over.                                           | <i>No</i>           | <i>Sometimes</i> | <i>Yes</i>       |
| I am “keeping up” and understanding what our group is doing and why.           | <i>No</i>           | <i>Sometimes</i> | <i>Yes</i>       |
| We have divided the work fairly.                                               | <i>No</i>           | <i>Sometimes</i> | <i>Yes</i>       |
| I would rate our collaboration as:                                             | <i>Non-existent</i> | <i>OK</i>        | <i>Very good</i> |
| One improvement I would suggest to improve communication and collaboration is: |                     |                  |                  |
|                                                                                |                     |                  |                  |

## Reflection

1. What do you know now that you didn't know before about how to get DNA out of a cell?
2. On a scale of 1–10. 1 is very low, 10 is very high:
  - Rate your current ability to communicate using evidence when talking in your lab group.

1            2            3            4            5            6            7            8            9            10

- Rate your current ability to communicate using evidence when talking in large class “lab meeting.”

1            2            3            4            5            6            7            8            9            10

- What is one way in which you grew in your ability to participate in a class discussion? Be specific. Give an example from the lab group work or meeting if possible.

1            2            3            4            5            6            7            8            9            10