

TONICITY OF SOLUTIONS



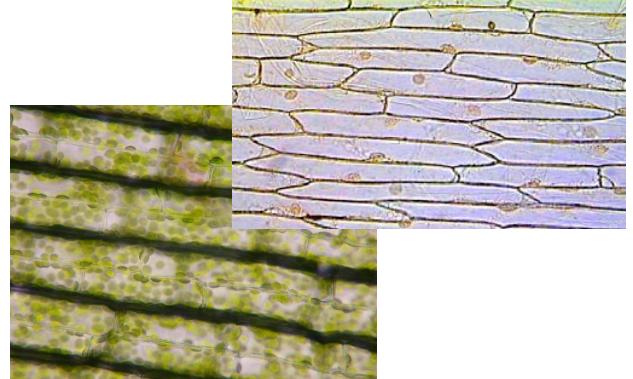
By: Lindsay Seely

Grade Level

- 10th, Variation of Unit 1, Activity 5 in LCC
- GLEs SI 1, 9, 10; LS 5

Materials

1. Elodea or red onion
2. Distilled water (hypotonic)
3. 0.9% Salt solution (isotonic)
4. 15% Salt solution (hypertonic)
5. Pipettes
6. Four slides with cover slips, deep well slides or Petri dishes
7. SOAR with 200X lens; use either in Stand-and-view or Invert-and-view configuration with XYZ mechanical stage



Procedure

- I. Discuss cell membrane structure and diffusion.
- II. Make up solutions – use the formulas given in the LCC, or for smaller amounts:
 - A. For .9% solution, add 0.45 grams of table salt to 50mL of distilled water
 - B. For 15% solution, add 7.5 grams of table salt to 50mL of distilled water
- III. Perform lab activity (Students will determine the effects of hypertonic, hypotonic, and isotonic solutions on a plant cell and predict in what direction water molecules will move when exposed to solutions)
 - A. Identify safety measures
 - B. Hypothesis: Water will flow into cells when placed in a hypotonic solution; water will flow out of cells when placed in hypertonic solution.
 - C. Experiment:
 1. Have a control slide of the plant to show students cells using SOAR
 2. Provide students with three slides of cell type being examined
 3. Use a pipette to drop a different solution type on each slide
 4. Wait 15 minutes and observe cells using SOAR
 - D. Analysis: Record observations in words and sketches
 - E. Conclusion: Write observations based on cells in types of solutions and direction of net flow of water

References

NatGeo Biology: Dynamics of Life 2004 ed. textbook

This work is supported in part by a grant to Louisiana State University from the Howard Hughes Medical Institute through the Precollege and Undergraduate Science Education Program.

LSU-HHMI Scope-On-A-Rope Program, 225-578-3080, soar@lsu.edu, www.scopeonarope.lsu.edu