

Cell Structure: Permeability of Living Membranes

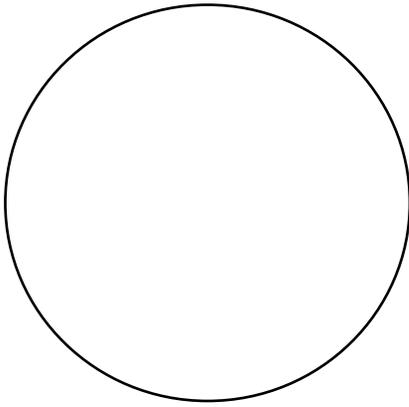
Intact membranes are essential for the health, well-being and the very existence of cells. Recall, membranes of living healthy cells control the entrance and exit of molecules to maintain homeostasis. What conditions affect membranes and the permeability of membranes? The model organism used in this activity is yeast. Yeast are single-celled members of the Kingdom Fungi.

Materials

Yeast	Test tube clamp or hot glove
Marker	Boiling beads
Pipette	Microscope slides -2
Test tubes – 2	Cover slips – 2
Test tube rack	Microscope
Hot plate	Congo red
Beaker – 500 mL	

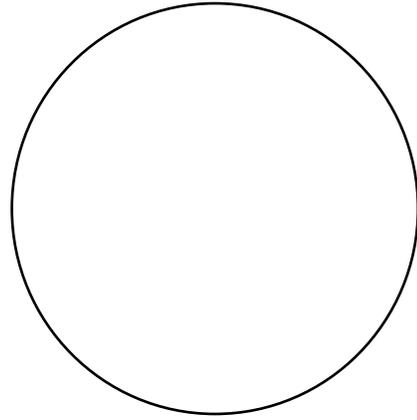
Procedure

1. Retrieve 2 test tubes and a test tube rack from the supply table.
2. Plug in the hot plate and turn on high. Fill the beaker half full with water, add boiling beads and place on the hot plate.
3. Label 1 test tube 100^o C and the other 25^o C. Label each tube with the initials of your group members.
4. Add 20 drops of yeast to each test tube. Add 3 drops of congo red to each tube.
5. Place the test tube labeled 100^o C in the beaker containing boiling water. Boil for 5 minutes.
6. Use the test tube clamp or hot glove to remove the test tube from the boiling water bath. Allow the tube to cool for 5 minutes.
7. Use a pipette to remove a sample of yeast from the 100^o C test tube. Place a drop in the center of a microscope slide. Cover the sample with a coverslip. Mark '100' on the slide to prevent the slides from being mixed up.
8. Use a pipette to remove a sample of yeast from the 25^o C test tube. Place a drop in the center of a microscope slide. Cover the sample with a coverslip.
9. Place each slide on the microscope in turn. Start at 4X, find and focus on the yeast. Increase magnification up to 400 X.
10. Draw what you observe below. Note the shape and consistency of cell shape in the samples. Also observe the Congo red dye, is it in the cells or not?



Non-boiled yeast

Magnification _____



Boiled yeast

Magnification _____

11. Describe the yeast in the non-boiled sample.

12. Describe the yeast in the boiled sample. Explain their appearance.

13. What effect did boiling have on the selective permeability of the yeast cell membranes?