UNIT 2 - BASIC PRINCIPLES OF BODY CHEMISTRY

ACTIVITY - Active Transport Across The Plasma Membrane

Objective:
The student will be able to comprehend that energy is required to move substances across the cell membrane against the concentration gradient.

Materials:

- Dry Yeast
- 0.75% Na_2CO_3
- 0.02% neutral red dye
- 0.75% acetic acid
- filter paper discs to fit funnels.

Strategies:
Demonstrate the dye (neutral red) by adding weak acetic acid. Color change occurs.
Place 25 ml of 0.75% Na_2CO_3 in a large test tube. Add 1 gm dry yeast.
Boil solution gently for 2 minutes. Label the tube A.
Place 25 ml of 0.75% Na_2CO_3 in a large test tube, warm, and then add 1 gm dry yeast.
Allow the solution to sit for 10 minutes (to activate the yeast) Label the test tube B.
Add 25 ml of 0.02% neutral red to test tube A. Observe and record color change.
Add 25 ml of 0.02% of neutral red to test tube B. Observe and record color change.
Filter a portion of the contents of each test tube. Observe and record color of cells left on the filter paper and color of solution of each test tube.

Think about your observations and answer the following questions:
a) Did the dye enter the cells of either test tube?
b) Did Na_2CO_3 enter the cells of either test tube?
c) Is the cell membrane of the cells of A or B permeable?

Conclusion:
Either the cells of test tube B put out something to change the solution or the dye entered the cells and was changed in the cytoplasm. (Cytoplasm is slightly acidic)
Add an equal amount of acetic acid to the remaining contents of test tube A.
Observe and record any color change.
Filter a portion of the suspension. Record the color of the cells.
Remove the filter paper of the original filtration of test tube A contents.
Place a drop of acetic acid on the cells. Observe and record any color change.