Nano at Home

Understanding Passive Transport Using Eggs

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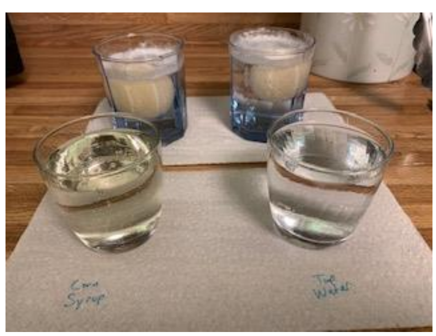
Description: How do single cells behave when their environment gets changed? When particles and solutes can enter or exit the cell through its membrane without requiring energy input, that is called passive transport. Let's experiment with an egg, the biggest cell.

What you will need:

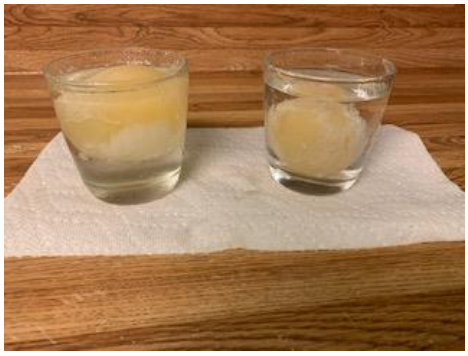
- 5 glass cups
- 3 eggs
- Vinegar
- Corn syrup
- Water

Instructions:

1.) Fill 3 glass cups with enough vinegar to fully submerge an egg
2.) Place one egg into each cup of vinegar and let it soak for 24 hours. This allows for the shell of the egg to dissolve, just leaving the membrane of the egg.

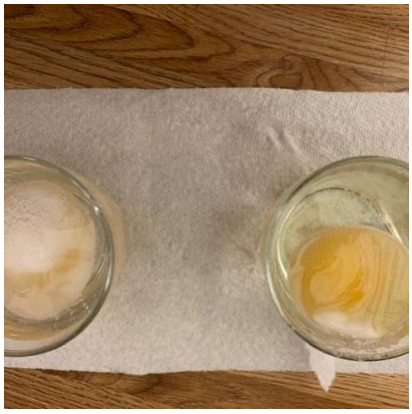


Here are the eggs soaking in vinegar for 24 hours. Image by Gabrial Goldner.



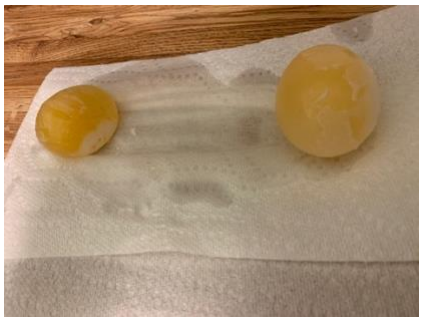
You can see that the eggshell is dissolving, leaving the bare egg membrane. Image by Gabrial Goldner.

3.) After 24 hours, take all three eggs out of the vinegar cups.
4.) Fill a new cup with enough corn syrup to fully submerge one egg. Place one of the eggs from the vinegar step into the corn syrup. Allow this to soak for 24 hours.
5.) Fill another new cup with enough water to fully submerge one egg. Place another one of the eggs from the vinegar step into the water. Allow this to soak for 24 hours.



Here are the eggs soaking in their respective solutions of corn syrup and water. Image by Gabrial Goldner.

6.) Compare the sizes of each egg. What do you notice about the difference in sizes? What can we infer about diffusion across the egg cell membrane?



The eggs after 24 hours. Image by Gabrial Goldner.