

If you want to do this experiment at home, follow this link to the instructions!

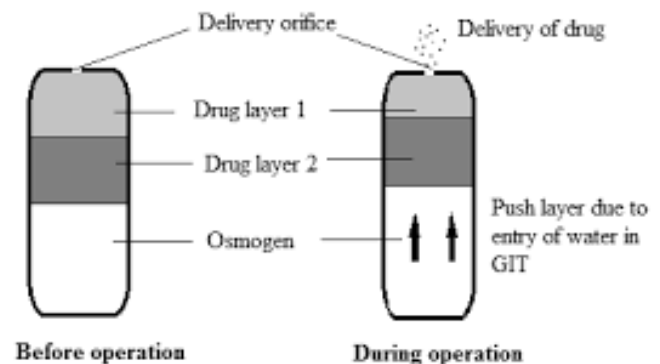
https://www.teachengineering.org/activities/view/cub_biomed_lesson05_activity1

How does biomedical engineering link chemistry, biology, and engineering?

Biomedical engineers use science and skills from each of the different fields to solve problems in the world of medicine and health. Biomedical engineers often combine the three fields in medication design, as coming up with new drug delivery systems requires knowledge of both chemistry, biology, and engineering.

Real Life Applications of Protect That Pill:

In order for pills to release the drug in the correct amounts at the right time, biomedical engineers must design pill coatings and a system that will put the coatings on the pills. The coatings on the pills are important, as the thickness and material the coatings are made of will determine how the drug affects the body. If the coating of the pill is wrong, the medication will not work properly. Engineers play a key role in the design process of the drug delivery system, and they invent these systems for making sure each pill is coated correctly before it is sent to the consumer.



The image to the left shows what your experiment will look like after the candies have sat in the solution for about 8 minutes, showing us that the coating on the “pill” on the right delays the delivery of the drug in the stomach.

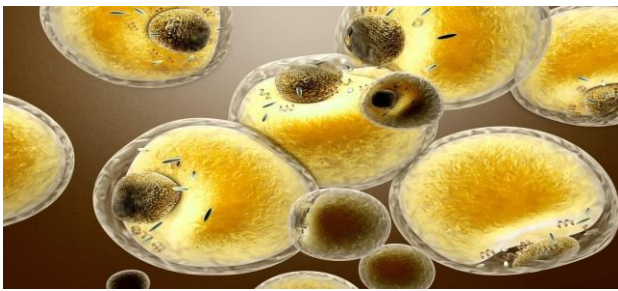
If you want to try Protect That Pill at home, feel free to get creative with your “pill” coatings, and see if you can come up with different coatings from other household items!



Biomedical Engineering: Candy Cell Creation

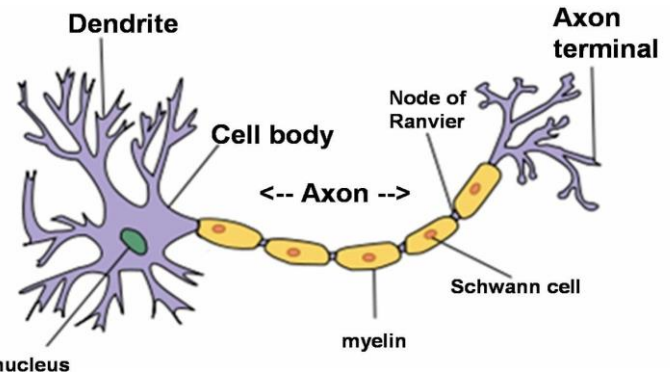
What is a cell?

Cells are the building blocks of life. The average size of a cell is 30 micrometers. Every cell contains a membrane, nucleus, ribosomes, mitochondria, and Golgi apparatus. Despite every cell's make up being startlingly similar, some kind of cells look nothing like the other. For example, the nerve cells, muscle cells, and liver cells look nothing alike.



Cells and Engineering:

Tissues are a structure made up of similar cells. Tissues are important because biomedical engineers can work in tissue engineering. Tissue engineering is the ability to create tissues through cell culture, materials development, and genetic engineering. Tissue engineering has the possibility to positively change the treatment of both injuries and disorders. The core knowledge when developing said tissues is understanding and predicting cell behavior and cell growth.



Why are cells important?

Trillions of cells are contained in the human body alone. Cells are constantly at work to keep the body healthy. Nerve cells in the body are what allows a person to know whether something they touch is hot or cold. An electrical impulse will go through the nerve cell which will result in the neuron releasing a message to the neighboring nerve cell. This continues until the message reaches the desired destination, usually the brain or muscle.



ADIPOCYTE



Want to do the Candy Cell Creation at home?

All you need to recreate this activity at home is a picture of the structure of the cell that is being modeled and an assortment of candy to use as the parts of the cell.



What are prosthetics?

A prosthetic is an artificial body part. Engineers design prostheses for maximum strength, durability, longevity, and lifelikeness so that amputees can live full and normal lives. Prosthetics are typically made for the leg or the arm. Sometimes the entire leg is a prosthetic, sometimes just below the knee, and sometimes it is just the foot. Prostheses can be made for a specific individual to accommodate their height, weight, and what activities they want to perform. If you watch the Special Olympics, you will frequently see athletes who have prostheses that are tailor made for maximum athletic movements (such as running or swimming).



Why do we need prosthetics?

Prosthetics can help people who have lost their limbs live normal lives. Maybe someone got in an accident and lost a limb, maybe someone came back from war wounded, or maybe they developed a disease that required a limb to be amputated. There are many reasons why someone may have lost a limb, but the loss of a limb can make life incredibly challenging. Imagine trying to walk with only one leg. Imagine trying to make a sandwich with only one arm. As technology becomes more and more advanced, prosthetics continue to get better. They are becoming more life-like, stronger, comfortable, and presently scientists and engineers are working on getting a prosthetic to move and respond to what the brain tells it to do.



Want to try the Prosthetic Party at home?

Gather up any supplies you have laying around at home and try to design the strongest, most comfortable, and longest lasting prosthetic leg. Try using paper rolls, sticks, pipes, or maybe try something else. Use your imagination and see what happens when you build a prosthetic at home.

