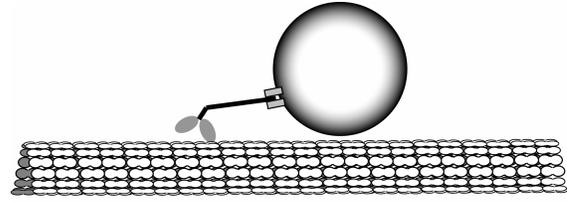


Biological Motors: The Movers and Shakers

Did you know inside our bodies are little motors that carry cargo inside of our cells? That is right our bodies have biological motors. These motors help to move important items inside of our cells. The motors move along tracks inside of our cells, the tracks start at the center of our cells and grow outward. The biological motors move along until they reach the place they need to go.



A drawing of kinesin carrying cargo along a microtubule.

COOL FACTS

- There are trillions and trillions of little motors in your body right now!!
- Our bodies contain many different types of motors, some work like trains moving on straight tracks, while others move in circles.
- The biological motors are 5 times more efficient than any motors humans can make on the same scale.
- Scientist have taken these motors out of our bodies and making them do work for us!!

FAQ's

Q: What are the motors and tracks made of?

A: The motors and tracks are both made of proteins. Specific motors will only move on a certain type of track. One type of motor track system is kinesin and microtubules. The kinesin protein is the motor and the microtubules are the tracks. The microtubules are made a protein called tubulin.

Q: How are the tracks made in a cell?

A: When our cells want to move cargo from the center of the cell to the outer portions the cells produce tracks. In the kinesin based motor system the tracks grow by adding individual tubulin proteins to the growing tracks.

Q: How do the motors walk along the tracks?

A: In the kinesin microtubule motor system the kinesin walks along the microtubule. The kinesin has feet that attach to the microtubule one at a time. After one foot attaches the other moves forward, the kinesin will do this until it reaches its destination.

Q: What do the motors carry in the cells?

A: One example is when our cells divide in a process called mytosis they need to have copy of everything that was in the original cell that divided. The tracks start at the center of the cell and move out in two opposite directions and cary the same cargo to each of the new cells. The motors will carry things such as DNA after replication to the new cells that are produced during the process of mytosis.

Q: How are the motors used outside of our bodies?

A: One example occurs when scientists attach the kinesin motors to a piece of glass so they can not move. The feet of the kinesin are sticking up in the air. A microtubule is placed on the motors. The feet of the kinesin push the microtubules along. It works just like a person who is body surfing!!! Scientists hope to attach cargo to the microtubules and use these motors to move very small cargo.

RELEVANCE TO OUR LIVES: While most of us did not know we have motors in our bodies, they certainly play an important role. They are vital to our cells diving and help keep the cells in good working order by moving things inside of our cells.

RESOURCES:

Nanotrains: <http://www.spacedaily.com/news/nanotech-03m.html>

Biomotors for drug delivery: <http://news.bbc.co.uk/1/hi/health/1035344.stm>

Biomotors: <http://cs.unc.edu/Research/nano/cismm/motors/>