Hydrothermal Vent

A fissure found on the seafloor near volcanically active places. Temperature can reach as high as 867 F.

Colon

The last part of the digestive tract found inside animals. This is where the remaining materials are broken down with the help of bacteria and archaea before excretion.

Red Sea

A seawater inlet located between Africa and Asia. The Red Sea is one of the saltiest waters in the world, a perfect place for salt-loving creatures.

Septic Water

Plenty of wastes to be found here. These waters have become a breeding ground for methanogens.

Pond

A body of freshwater brimming with life. Water plants provide a good source of energy, and there’s plenty of sunlight.

Trachea

Known as the windpipe that connects the larynx, and the bronchi of the lungs. Many foreign organisms are disposed of here by the hands of white blood cells. Beware the wandering macrophages!

Pond

A body of freshwater within an area brimming with life. A perfect place for predatory organisms.

Murky Swamp

A body of freshwater filled with grime. This particular area is filled with toxic bacteria, not ideal for consumption.

Whirlpool

Watch out for this downward spiral into the void. However, with this many organisms being pulled in, it’s sure to be a buffet.

Hazards

Sunlight

Contains the genetic information of the prokaryotic cell. The nucleoid determines how the cell will develop and grow.

Responsible for making proteins. These proteins are the workers of the cell, they provide energy for communication, repair, and growth.

These are extra DNA molecules that are commonly found in bacteria, and sometimes in other cells. They allow cells to mutate and adapt to an ever-changing environment.

An affinity for extremely hot temperature. These archaeans can thrive in environments near volcanos, hot springs, and acidic soils.

These archaeans release methane as a result of digesting materials such as carbon and hydrogen. They are known to play a role in breaking up materials for other cells to consume.

An affinity for salt. These archaeans can withstand the effects of salt which causes dehydration. They are also known to be resistant to UV radiation, giving them a reddish look.

A single flagellum that favors long distance travel.

Multiple flagella in one polar end of the cell that favors frequent twists and turns.

Multiple flagella around the cell that helps with even more frequent twists and turns.

A prokaryote that metabolizes methane. This particular type is anaerobic, which means it can live with little to no oxygen.

Capable of harnessing energy from sunlight through its chlorophyl component. This energy is then used to produce its own food from inorganic matter.

Eats anything organic that contains carbon and hydrogen, such as glucose.

This particular bacteria feeds from within the host, draining it of all its energy. Once engulfed, it secretes special proteins that will prevent itself from being consumed.

The command center of the cell that contains genetic information. The nucleus controls the cell’s actions such as growth and reproduction.

The factory of the cell that is responsible for synthesis of various materials. There are two types: rough and smooth. The rough one contains ribosomes and synthesizes protein, while the smooth one synthesizes different types of lipids.

The shipment and delivery service of the cell. The golgi apparatus puts proteins and lipids into vesicles to be transported to other parts of the cell.

The powerhouse of the cell. Its primary role is to generate energy in the form of adenosine triphosphate (ATP). Other functions include: heat generation, signaling activities, and mediates cell growth/death.

The storehouse of the cell. Its role is to store materials generated and digested by the cell.

Secretes special fluids that immobilizes smaller organisms on contact. Once immobilized, the organism is digested.

Protrudes sharp needle-like appendage to skewer unsuspecting victims. These appendages also act as a suction that drains the victim of all its vital energy.

Inhales anything small in its path. Unwanted liquid and materials are jetted out from the rear, which also allows this organism to propel itself forward.

A long whip-like structure that allows the cell to maneuver in liquid environment. A single flagellum allows for efficient long-distance travel.

Small hair-like structures around the surface of the cell. This one is used for motility in a liquid environment.

This environment is extremely hot! Only an organism capable of resisting extreme heat will be able to thrive here.

This environment is mostly filled with hydrogen components. An organism capable of digesting such materials will do well here.

This environment contains high concentration of salt, along with UV radiation. Unless an organism can withstand both salt and UV radiation, it will dry up to death.

This environment is low on oxygen, and filled with methane. Only an anaerobic, methane-eating bacterial will do well here.

If you are having difficulty with these predators, perhaps deploying parasitic bacteria will do the trick. Otherwise, this environment mostly provides glucose and sunlight.

Most bacteria cannot stand a chance against white blood cells, unless they are completely overwhelmed. For a greater success, try deploying parasitic bacteria.

This environment has a mixture of big and small organisms. A predator capable of hunting both will benefit the most here.

Toxic bacteria dominate this environment. An organism that can resist toxins should be able to thrive here.

The whirlpool is a pain, try to deploy your organisms at the outer region. That aside, an organism with strong propellant should be able to maneuver around it with much ease.

Welcome!

I am here to guide you on this journey to learn about cells.

But not just any cell…

The perfect cell!

<animate mote entering>

In this vast sea of nothingness comes a lifeless inorganic spec.

<animate mote turning into a blob>

By mysterious circumstances, various chemicals have gathered and formed to create a living organism.

In order to maintain its form, it must continuously consume materials, and convert them to energy.

But it can only maintain its form for so long…with your help however, we can let it grow, and reproduce for many generations!

<show life branch>

This is the classification of cells. As you can see, a cell can be one of two things: Prokaryote or Eukaryote.

We will begin our journey as archeans, the extremophiles of the prokaryote cells!

<next level>

Here we are going to choose which environment our organisms are going to inhabit.

Press the left and right arrow on the side of the screen to switch between environments. Keep in mind the hazards and energy sources!

Once you’ve decided, press the button on the lower right of the screen to proceed.

Now it’s time to shape the perfect cell!

Although organisms go through evolution in order to shape itself, you will instead choose what’s best.

Before we continue, let’s take a moment to look at the two components that keep the cell together.

The plasma membrane is a barrier that determines what goes in and out of the cell. That is something we can decide later.

Cytoplasm is the fluid that fills the cell. Its role is to sustain the structure and flow within the cell, along with metabolic activity.

Now you will place the internal components that keeps the cell alive.

Excellent! With all the essentials of the cells filled, we can now choose the other components.

In order for the cell to survive, pick the right structure that determines its resistance and energy source.

A cell cannot reach its energy source efficiently without proper motility. Pick a form of motility to determine how the cell moves.

Now that we’re here, the goal is to grow the population of our organisms to a certain amount.

You can find the population number, and the progress at the bottom left of the screen.

Time is limited, and when it is reached, all is lost. This is displayed at the bottom of the screen.

To deploy an organism, press any valid location on the screen. You have a limited amount to deploy, so choose each location wisely.

Press this button to speed things up!

Good work! Now let’s try another environment, and then we can move on to grander things!

As the perfect cells pass through numerous environments, few are able to adapt.

A new strategy for adaptation is in order.

We will now be moving forward as bacteria.

Though they are structurally similar to archaea, they differ in how their membrane is structured.

Now let’s see how they fare with the next environments!

After devouring many in its path, the perfect cell has outgrown the simple life of a prokaryotic cell.

In order to further grow, the perfect cell needs a more complex internal system to sustain its life.

Some of these digested organisms have found a way to integrate itself inside the perfect cell.

By taking refuge inside, they in return, provide the perfect cell further room to grow.

This is known as endosymbiotic. The smaller organisms inside allow the perfect cell to further evolve as they are given a safe haven.

Now it’s time to move on as eukaryotes.

Unlike prokaryotes, eukaryotes have membrane-bound organelles.

This allows eukaryotes to have more complex system such as unique appendages for hunting, as well as a way to communicate to other cells.

For the next environments, we will be going as protists.