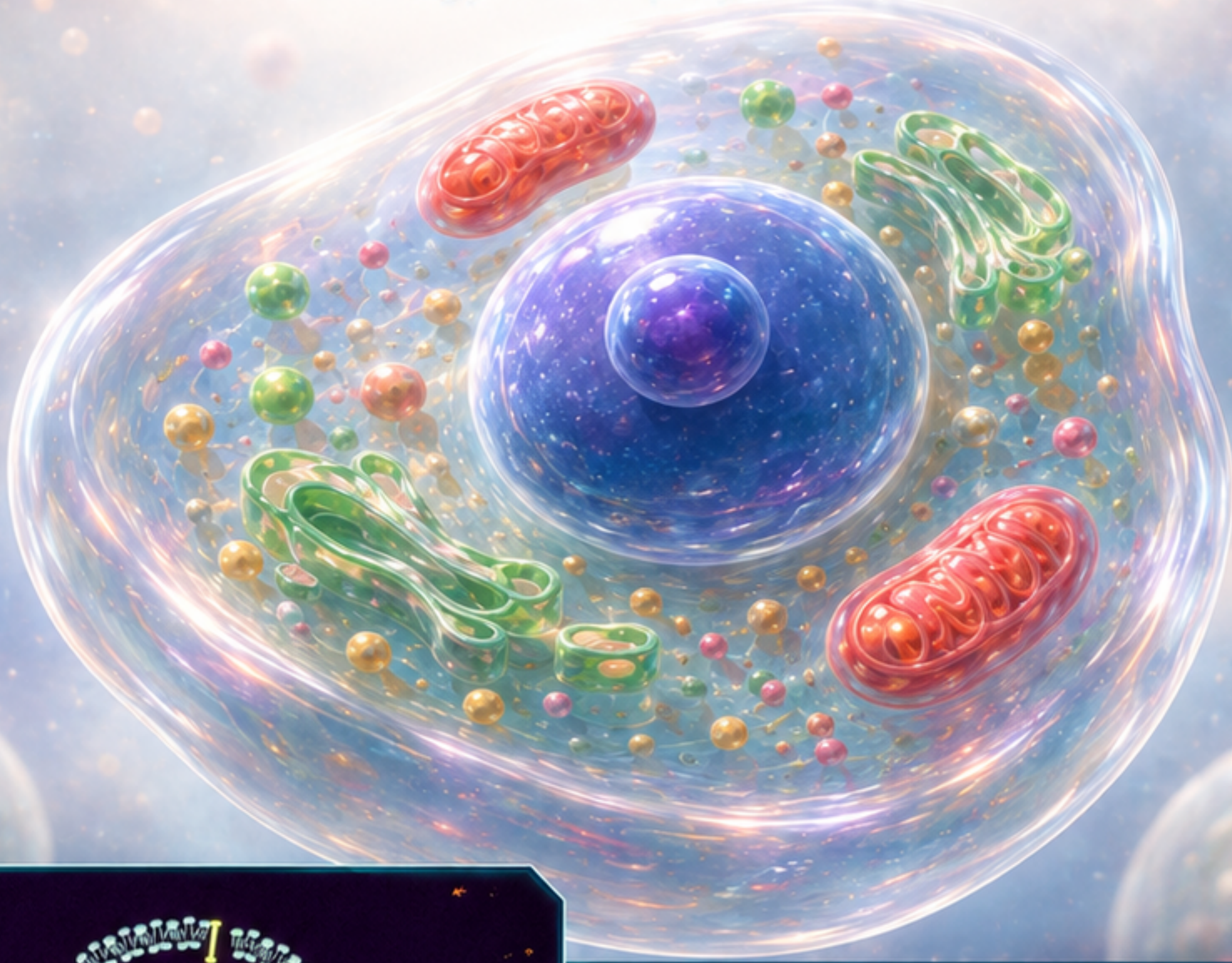




Cellula:

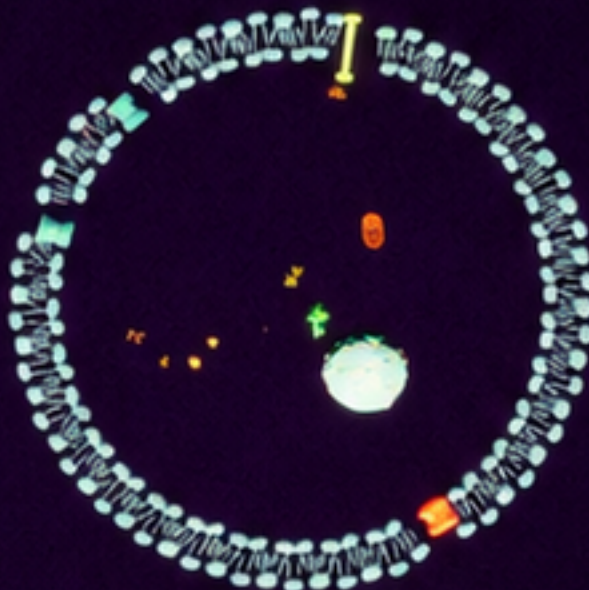
A Simple Guide to Cells

How cells survive, and how Cellula turns biology into a *playable* system



Score: 992

Cells: 1 (x1.0)



A free visual guide to cell survival, organelles, energy, waste, and infection.



Holy Splash LLC

Play Cellula on Steam for \$6.99

What Is a Cell?

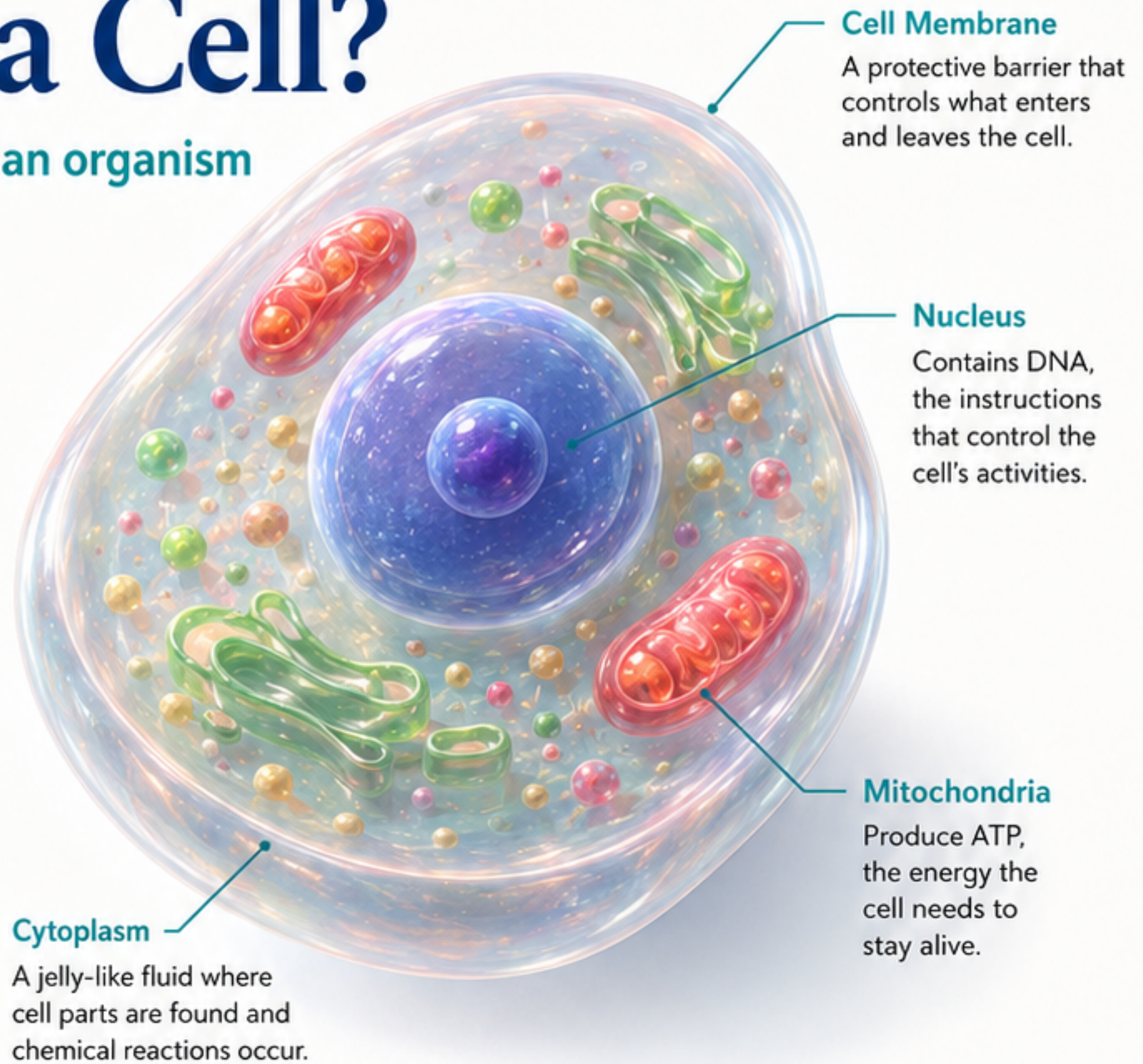
The smallest living unit of an organism

A cell is the smallest living unit of an organism.

Some organisms are made of only one cell. Others, like humans, are made of trillions of cells working together. But every living cell faces the same basic problem: How does it stay alive?

A cell must separate its inside from the outside world. It must bring in useful materials, make energy, build structures, remove waste, protect its genetic information, and respond to danger.

A cell is not just a bag of liquid. It is a living system.



In Cellula

In Cellula, you manage cells as survival systems. You begin with a simple cell and build the parts it needs to stay alive.

As you play, you manage resources, build organelles, bring in nutrients, produce ATP, clean up waste, defend against viruses, and divide into more cells.

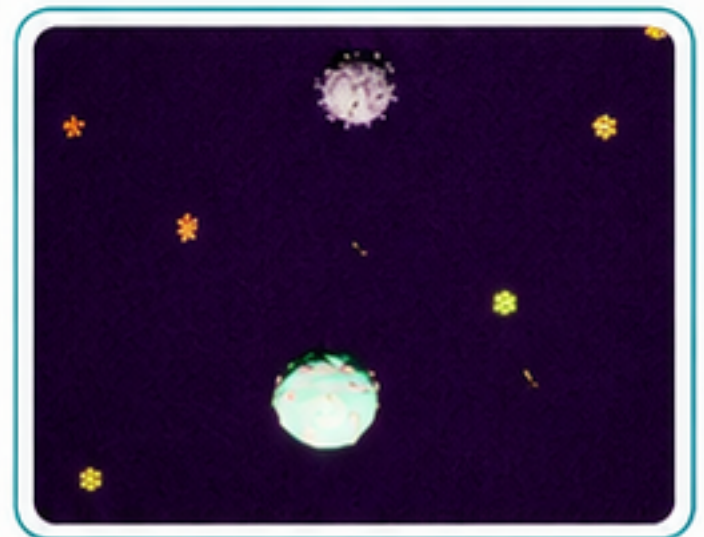
You are not just memorizing cell parts. You are learning what those parts do.

“A cell is not just a structure.
It is a living system.”



Build and Survive

Construct organelles, collect nutrients, and produce ATP to keep your cell alive.



Defend and Adapt

Protect your cell from viruses, remove waste, and respond to threats.



What you learn

A cell survives because many systems work together. If one system fails, the whole cell can be in danger.



The Cell Membrane

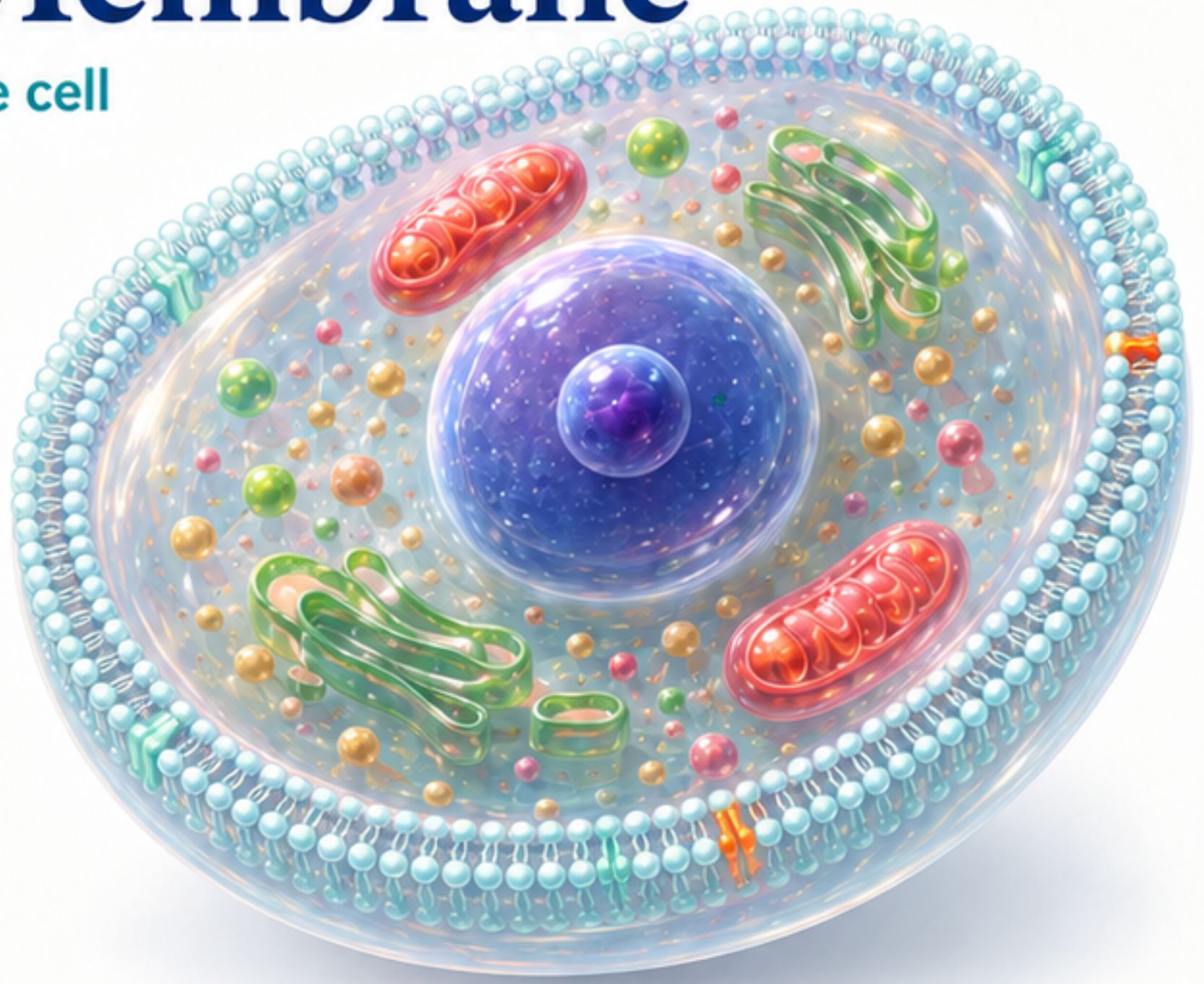
The border that protects the cell and controls exchange

Every cell needs a boundary. That boundary is called the cell membrane.

The membrane separates the inside of the cell from the outside environment. This matters because the cell must carefully control what enters and leaves.

Some things are useful. Some things are dangerous. Some things are needed only in the right amount.

The membrane helps the cell protect itself while still allowing exchange with the outside world.



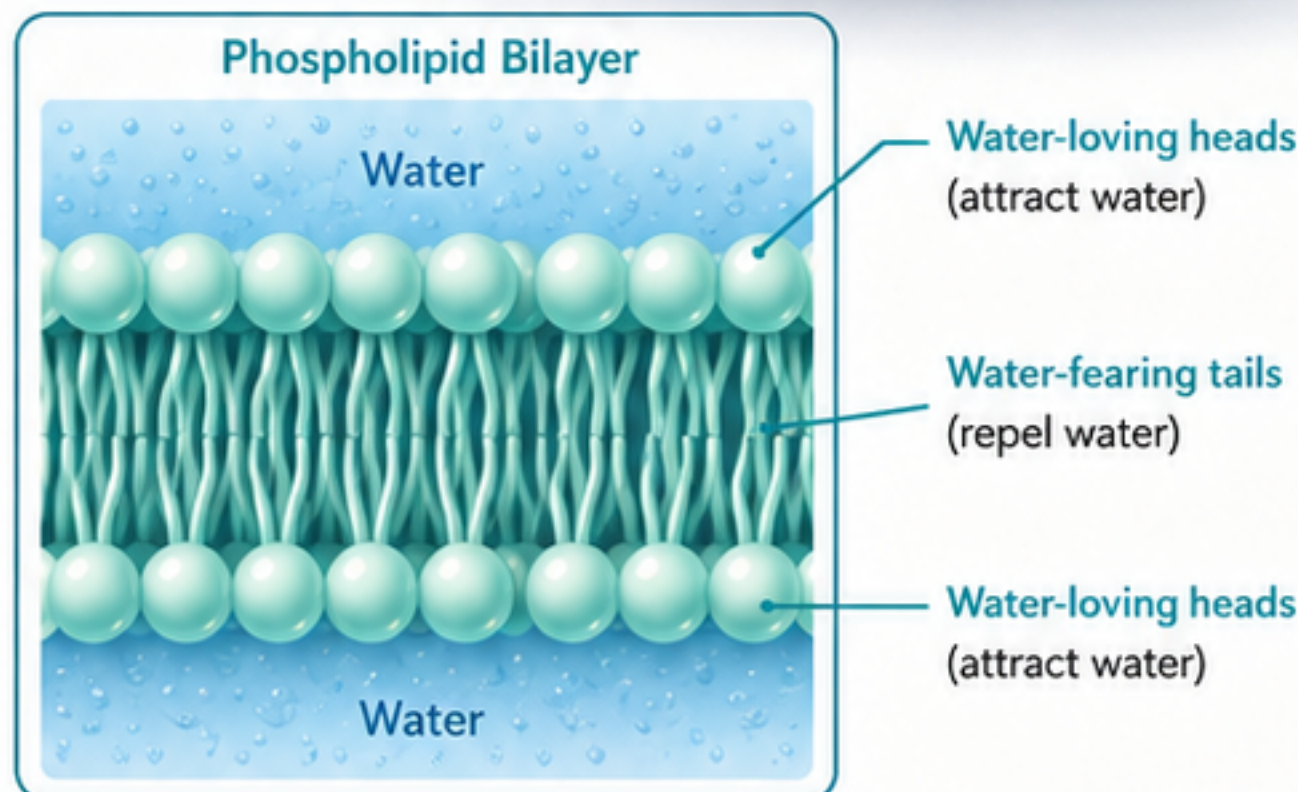
The phospholipid bilayer

The cell membrane is made mostly of molecules called phospholipids.

A phospholipid has two important parts: a water-loving head and water-fearing tails.

Because of this, phospholipids naturally form a double layer. The heads face the watery outside and inside of the cell. The tails hide together in the middle.

This double layer is called the phospholipid bilayer.



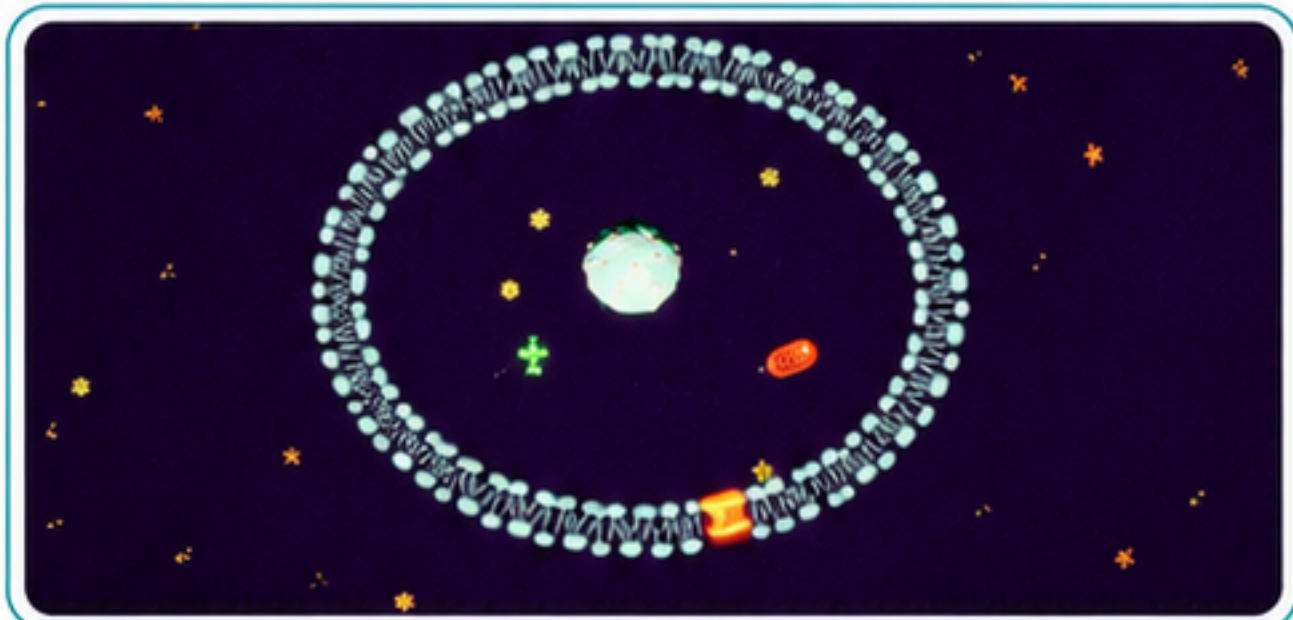
“
*It is not a
brick wall.
It is a living
border.*
”



In Cellula

In Cellula, the membrane appears as a ring around the cell. The membrane protects the cell's inside, but it also needs entry points so useful materials can get in.

As the cell grows, the player must build and maintain membrane structures. The membrane is not background decoration. It is part of survival.



What you learn

The cell membrane is both a wall and a gateway. It protects the cell while controlling what passes through.



Transporters in the Membrane

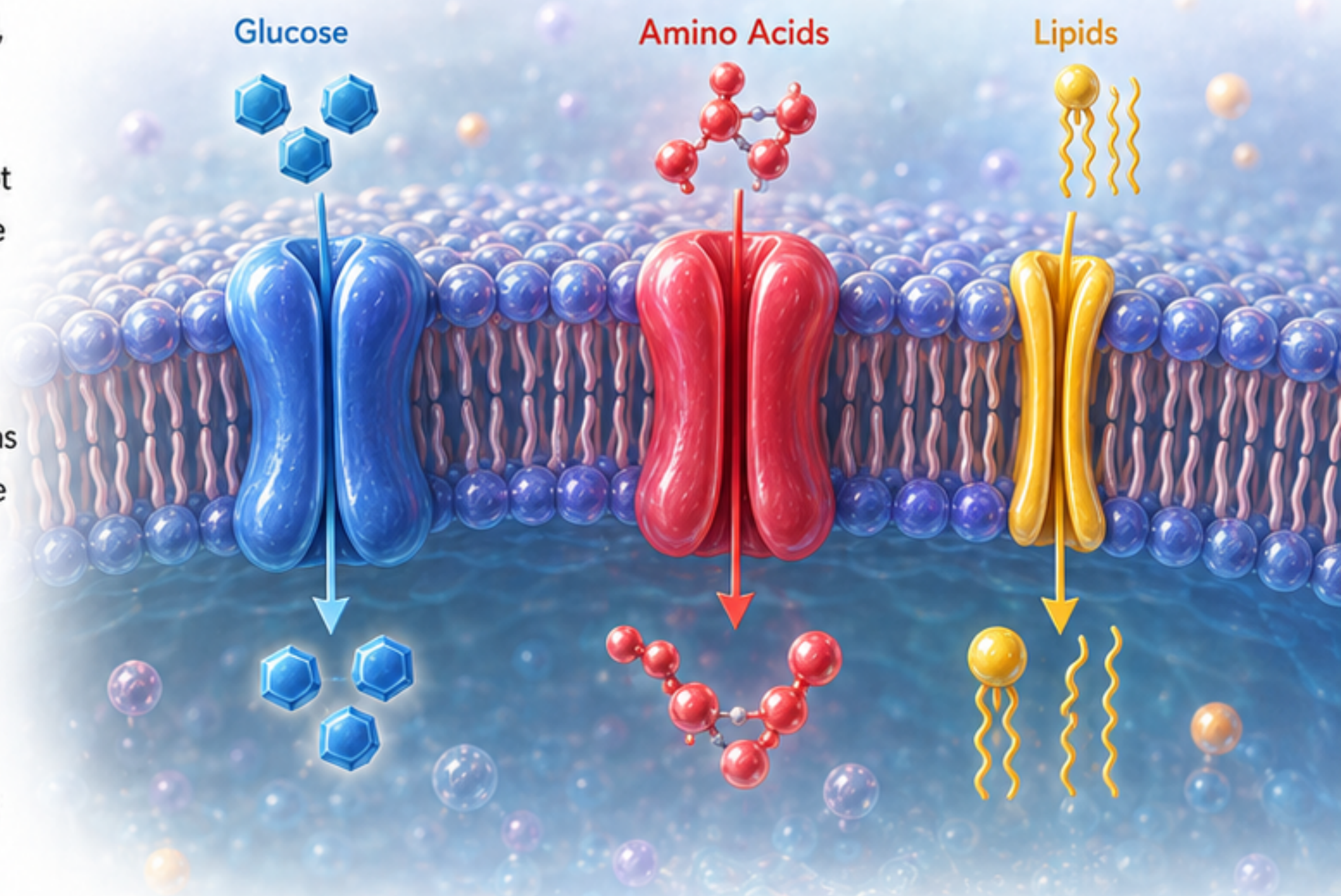
Different nutrients need different doors

The membrane protects the cell, but the cell still needs supplies.

Many important molecules cannot simply drift through the membrane whenever they want. They need help crossing.

That help often comes from proteins embedded in the membrane. These proteins can act as transporters, moving specific materials into or out of the cell.

Transporters are selective. A transporter that helps one type of molecule may not help another.



In Cellula

Cellula shows transporters as distinct structures embedded in the cell membrane.

Blue transporters move glucose. Red transporters move amino acids. Yellow skinny transporters move lipids.

Because each transporter looks different, the player can see that nutrients do not all enter the cell through one generic door.

— Important nutrients —

Cells need glucose for fuel, amino acids to build proteins, and lipids for membranes and other structures.

“Different resources
— need different doors.”



What you learn

A cell membrane is not just a barrier.
It is a smart border with specialized entry systems.



Nutrients and Resources

A cell survives by managing materials and energy

Cells need materials to survive.

A cell must constantly take in useful molecules, transform them, move them, store them, and use them to build new parts.

In a living cell, resources are not abstract points. They are physical materials that must be gathered and used.

Proteins

Proteins perform most of the cell's work and provide structure, motion, and function.

Amino acids

Amino acids are the building blocks of proteins.

Glucose

Glucose is a sugar molecule. Cells can break glucose down to harvest energy.

Lipids

Lipids are important for membranes and many cellular structures.

Oxygen

Oxygen is needed by mitochondria to produce large amounts of ATP efficiently.

ATP

ATP is the cell's main energy currency.

Waste

Waste products are byproducts of cellular activities. They must be removed.

Phospholipids

Phospholipids are used to build and repair cell membranes.



In Cellula

Cellula makes resources visible.

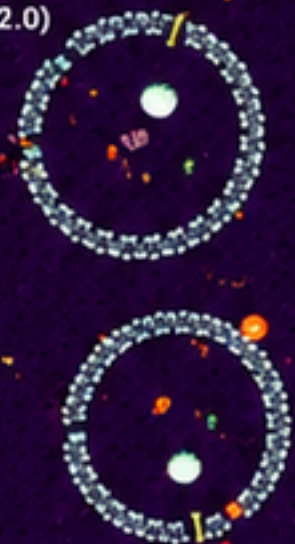
The player tracks materials like ATP, proteins, glucose, amino acids, waste, lipids, phospholipids, membrane bricks, and oxygen.

If the cell does not have enough resources, it cannot build what it needs. If it cannot build what it needs, it becomes vulnerable.

ATP: 125
Proteins: 87
Glucose: 49
Amino Acids: 8
Waste: 1
Lipids: 54
Phospholipids: 0
Membrane Bricks: 34
Oxygen: 294

Score: 738
Cells: 1 (x1.0)

Score: 2104
Cells: 2 (x2.0)



“A cell survives by managing resources.”



What you learn

Cells are living economies. They must gather materials, spend energy, build structures, and manage waste.



Mitochondria, Oxygen, and ATP

How cells turn fuel into usable energy

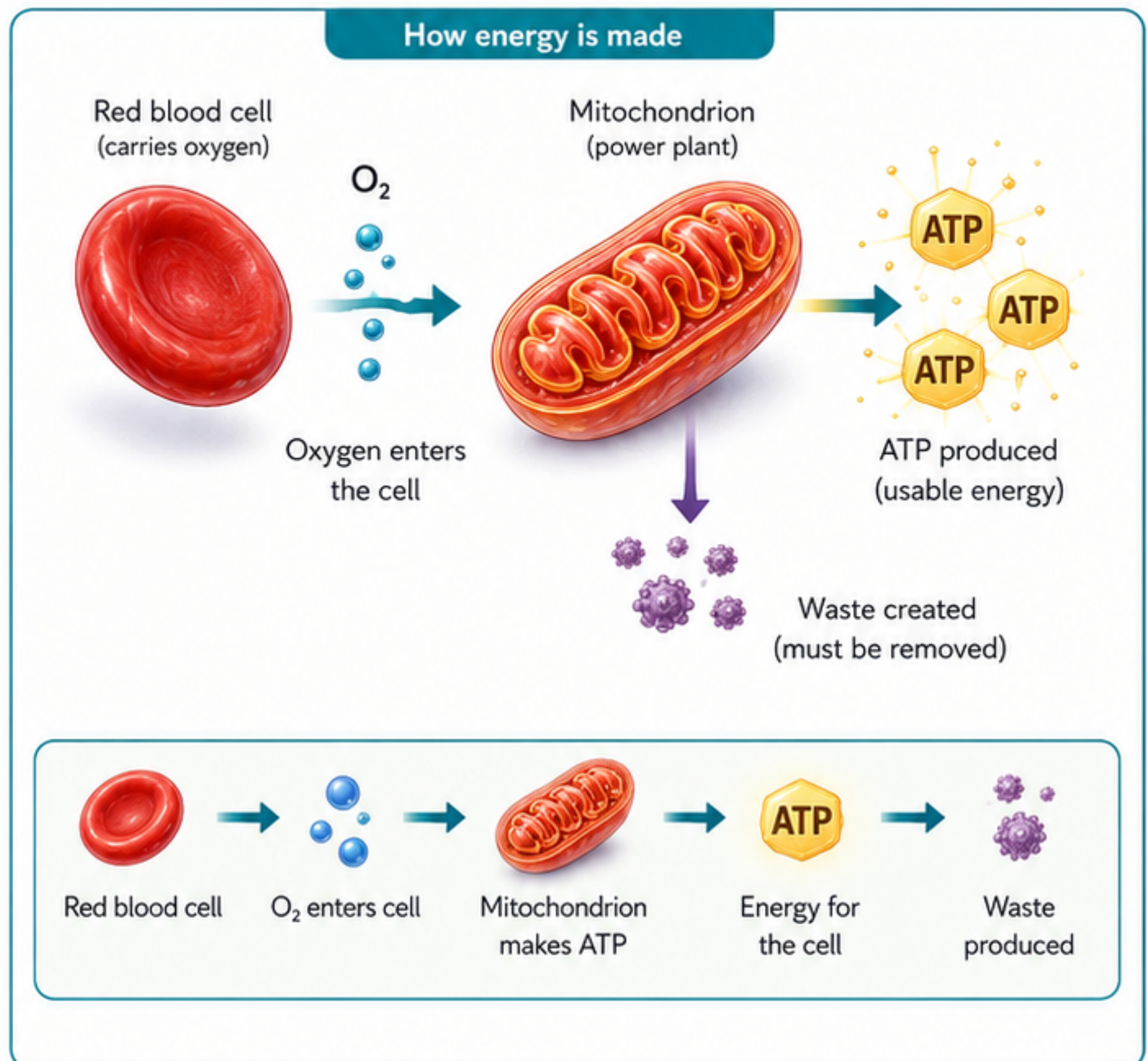
Cells need energy to do everything: build, move, repair, and think. They use a molecule called **ATP** for this usable energy.

Mitochondria are the cell's power plants. They make most of the ATP.

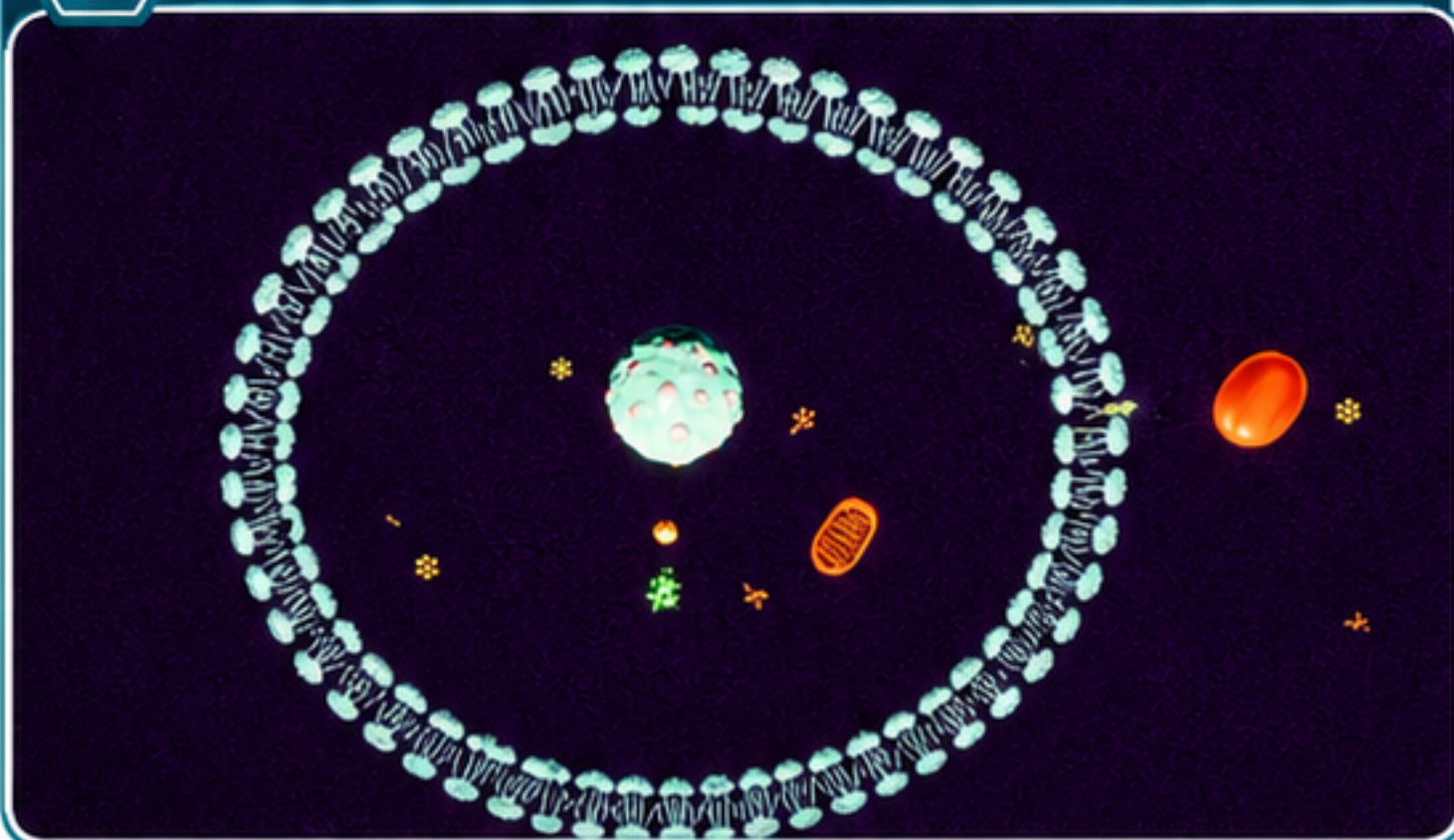
Oxygen is essential. It accepts electrons at the end of the electron transport chain inside the mitochondrion. This final step allows ATP to be made continuously.

In Cellula, red blood cells drift near your cell and release O_2 . That oxygen enters your cell and allows mitochondria to keep producing **ATP**.

Making ATP also creates waste that the cell must remove.



In Cellula



This is an actual gameplay screenshot. You can see:

- Your cell's **phospholipid membrane**
- The **nucleus** inside
- A **mitochondrion** (red/orange)
- A red blood cell outside the cell

When the red blood cell drifts close, it releases O_2 . That oxygen diffuses into your cell and helps mitochondria keep producing **ATP**.



What you learn

Energy is not magic. A cell needs fuel, oxygen, mitochondria, and cleanup systems working together.



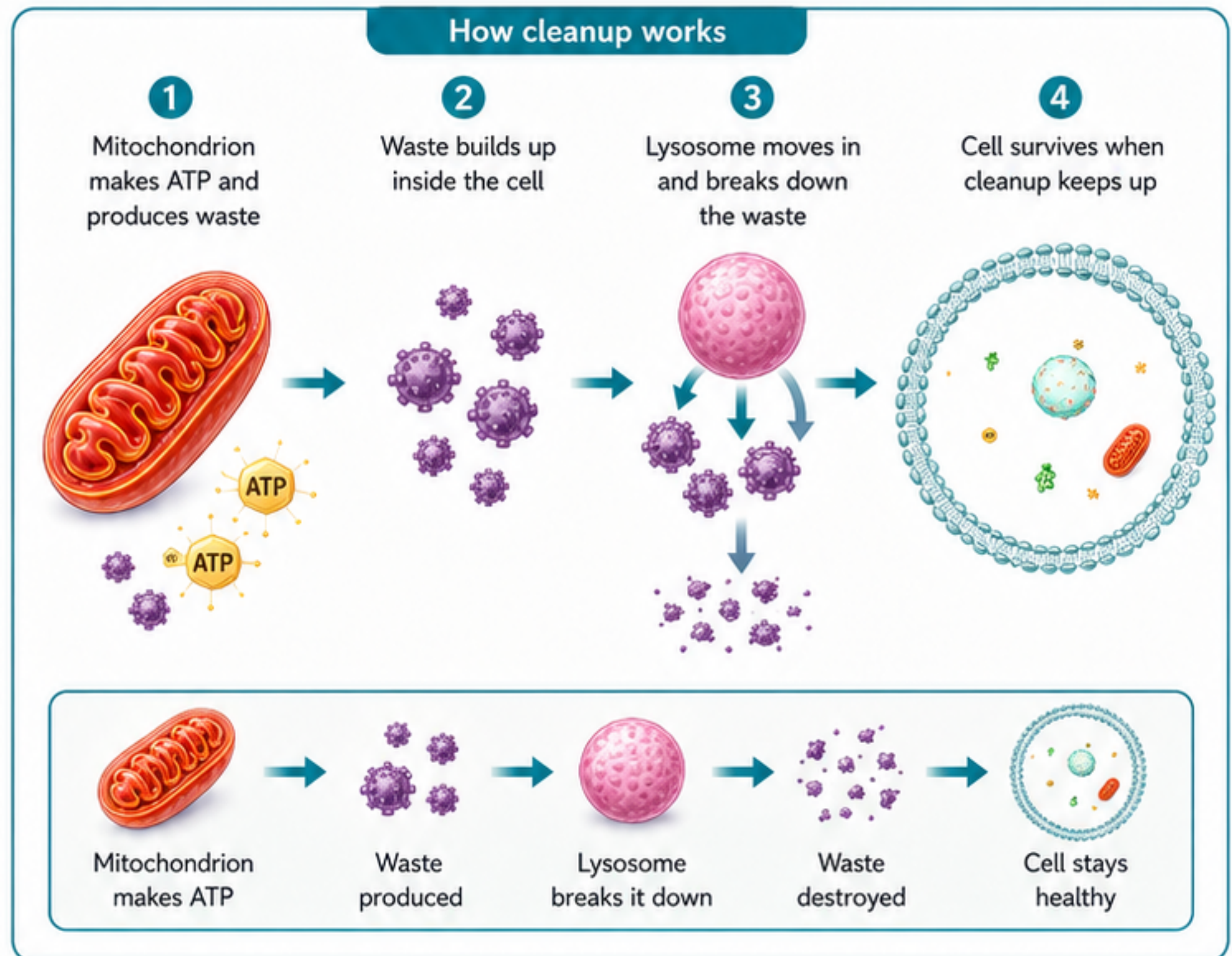
Cellula is available on Steam for \$6.99.

Waste and Lysosomes

Cleanup is survival

Cells are busy. They build, break down, repair, transport, defend, and produce energy. All of that activity creates waste. Some waste leaves the cell. Some damaged material must be broken down inside the cell. If waste builds up too much, the cell becomes damaged and can die.

One important cleanup organelle is the **lysosome**. Lysosomes contain digestive enzymes that break down waste, damaged cell parts, and unwanted material. A lysosome is not just a trash can. It is more like a recycling stomach inside the cell.



In Cellula

Score: 1592
Cells: 1 (x1.0)



This is an actual gameplay screenshot. You can see:

- Your cell's **phospholipid membrane**
- The **nucleus** inside
- A **mitochondrion** (red/orange)
- A **lysosome** (pink)
- **Waste** and threats inside the cell

As your cell makes ATP, waste builds up. Lysosomes help clean that waste before it becomes dangerous. Lysosomes can also destroy viral DNA or RNA before it reaches the nucleus.



What you learn

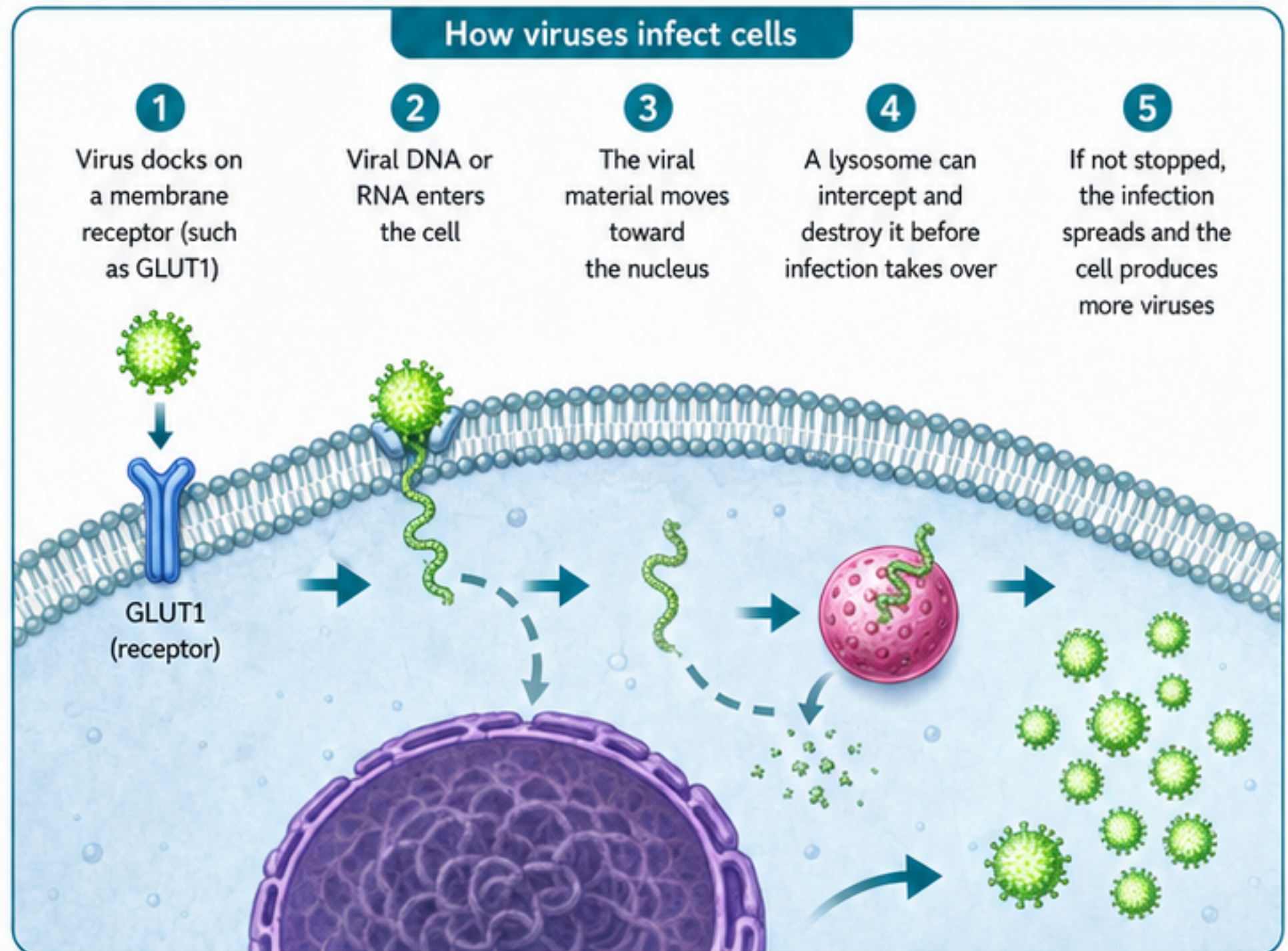
A living cell must clean as well as build.
Production without cleanup becomes danger.



Viruses and Infection

Tiny invaders that hijack cells

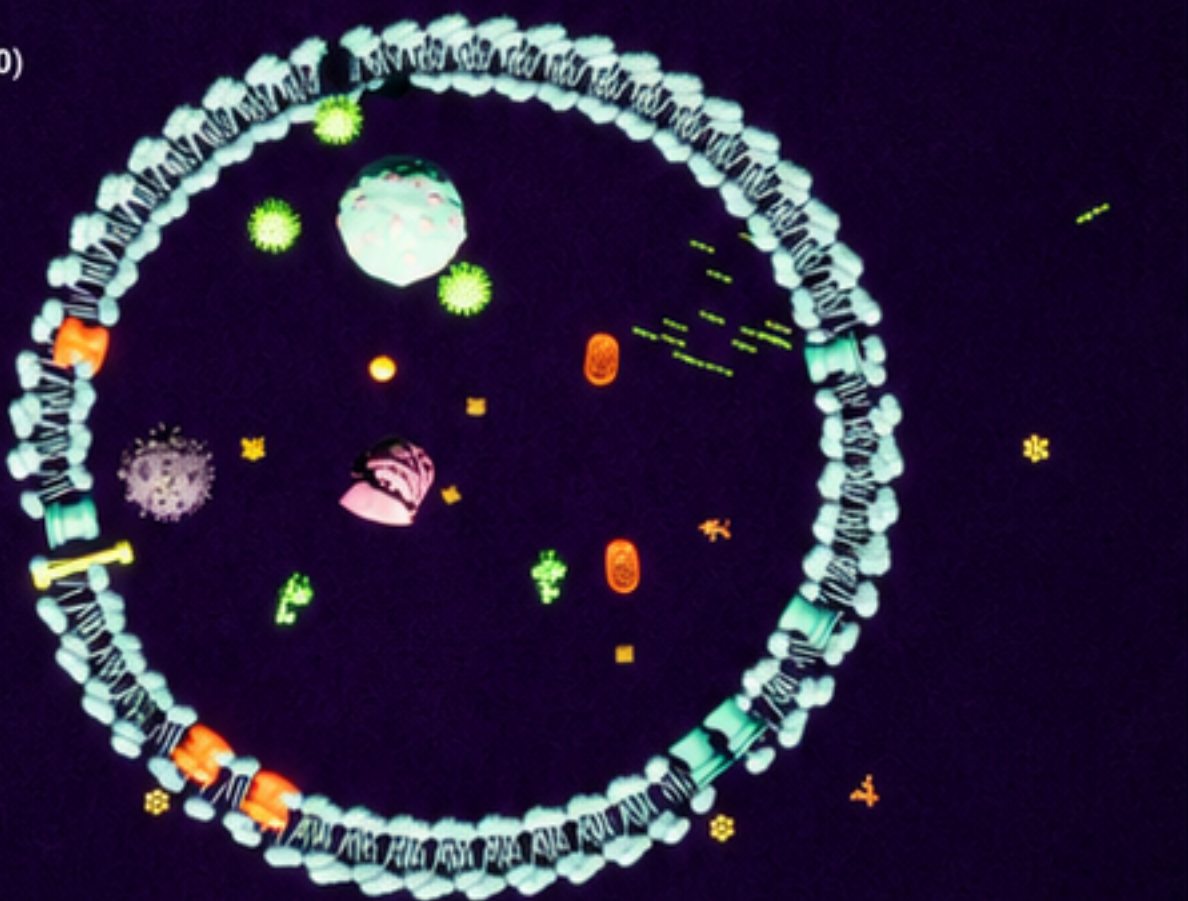
Viruses are not cells. They cannot reproduce on their own. To make more copies of themselves, viruses must enter living cells and use the cell's machinery. Many viruses begin by attaching to structures on the cell membrane. These structures may normally help the cell, but viruses can exploit them as entry points. Once a virus enters, it can release genetic material, such as DNA or RNA. If that genetic material reaches the right place inside the cell, the infection can take hold.



In Cellula

Score: 1592

Cells: 1 (x1.0)



This is an actual gameplay screenshot. You can see bright green viruses around and inside the cell. *In Cellula*, viruses can enter through a membrane receptor and release genetic material into the cell. If that material reaches the nucleus, the infection can spread and the cell begins producing more viruses. A lysosome placed between the receptor and the nucleus can help intercept and destroy the threat before it takes over.

- phospholipid membrane
- nucleus
- mitochondrion (red/orange)
- lysosome (pink)
- bright green viruses



What you learn

Defense is strategy. Where cell parts are placed can decide whether the cell survives.



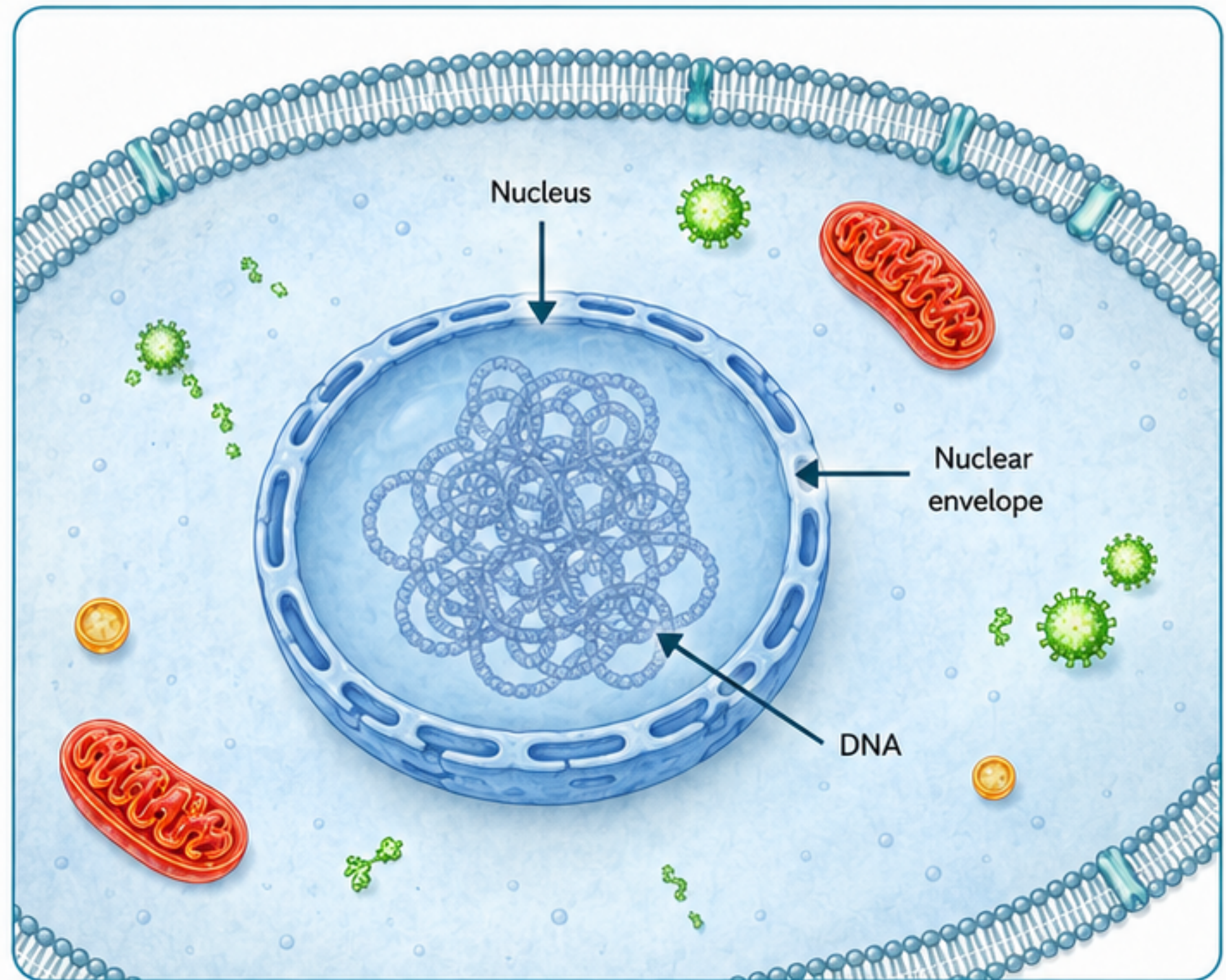
The Nucleus

Protecting the cell's instructions

The nucleus is the part of the cell that stores most of its DNA. DNA contains instructions for building proteins and controlling cell activity. These instructions help the cell grow, repair itself, respond to signals, and maintain its systems.

The nucleus is protected by a membrane called the nuclear envelope. This envelope helps separate DNA from the rest of the cell.

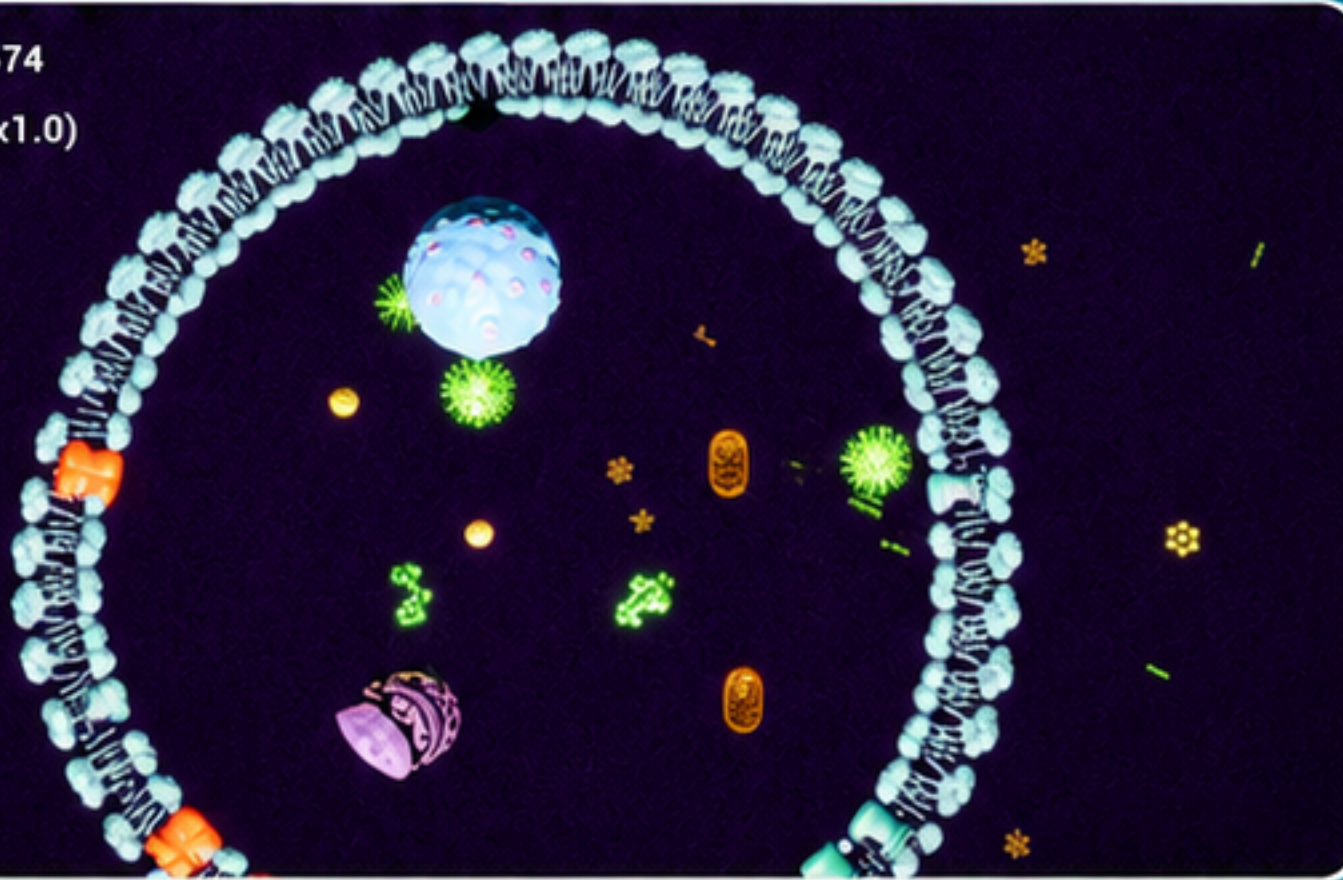
The nucleus is not simply the 'brain' of the cell. A better way to think of it is this: the nucleus is the cell's protected information center.



In Cellula

Score: 1574

Cells: 1 (x1.0)



In Cellula, the nucleus is a major structure inside the cell. It must be protected.

If viral DNA or RNA reaches the nucleus, infection can take hold and the cell may be lost.

This makes the nucleus more than decoration. It becomes something the player must defend.



What you learn

Life depends on information. A cell must protect its instructions as well as its energy supply and structure.



ER and Golgi

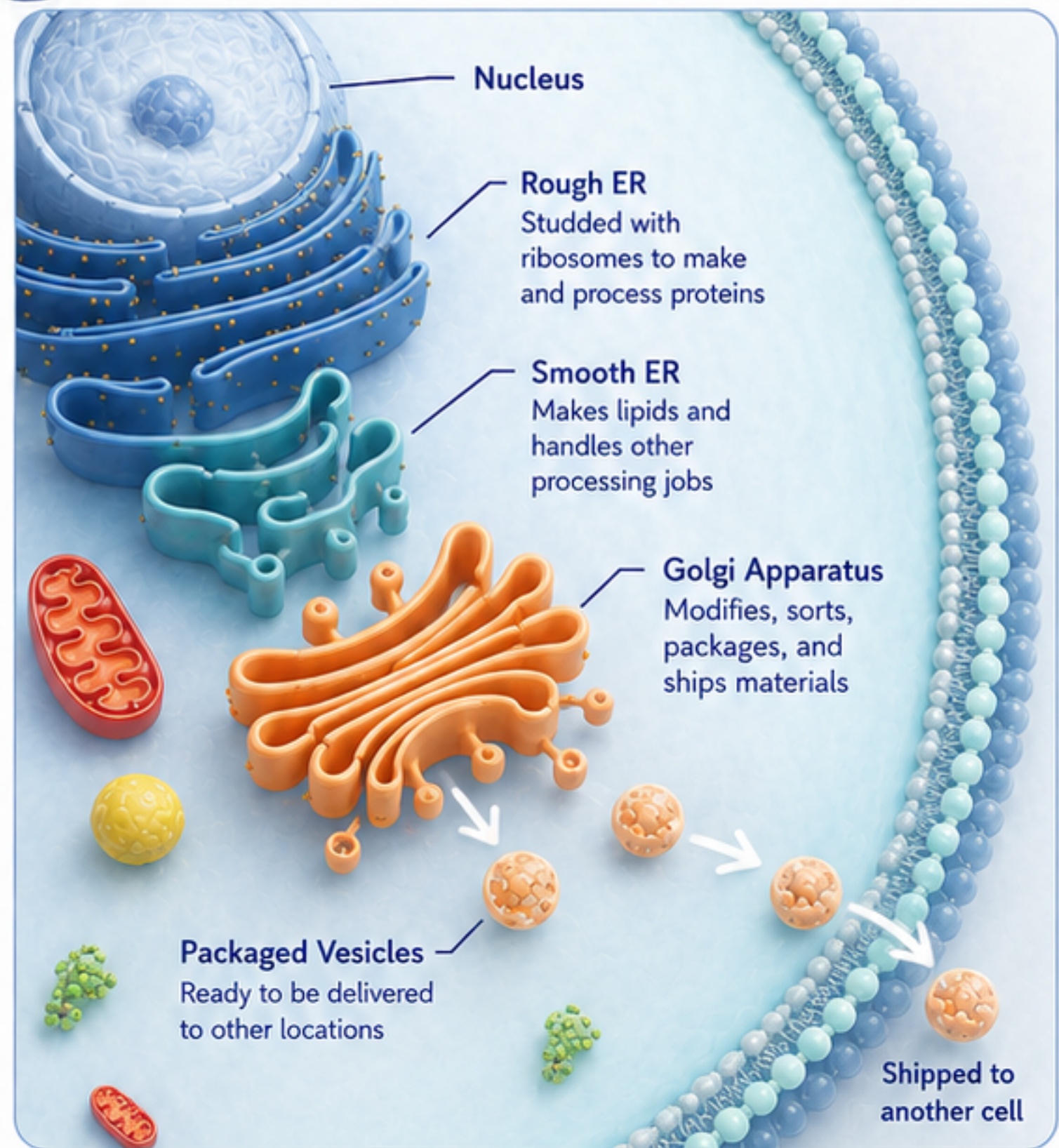
Building, processing, and shipping

1. What they do

Cells do not just collect resources. They also build, process, and move them.

The endoplasmic reticulum, or ER, helps make important cell materials. Rough ER helps make and process proteins, while smooth ER helps make lipids and handle other processing jobs.

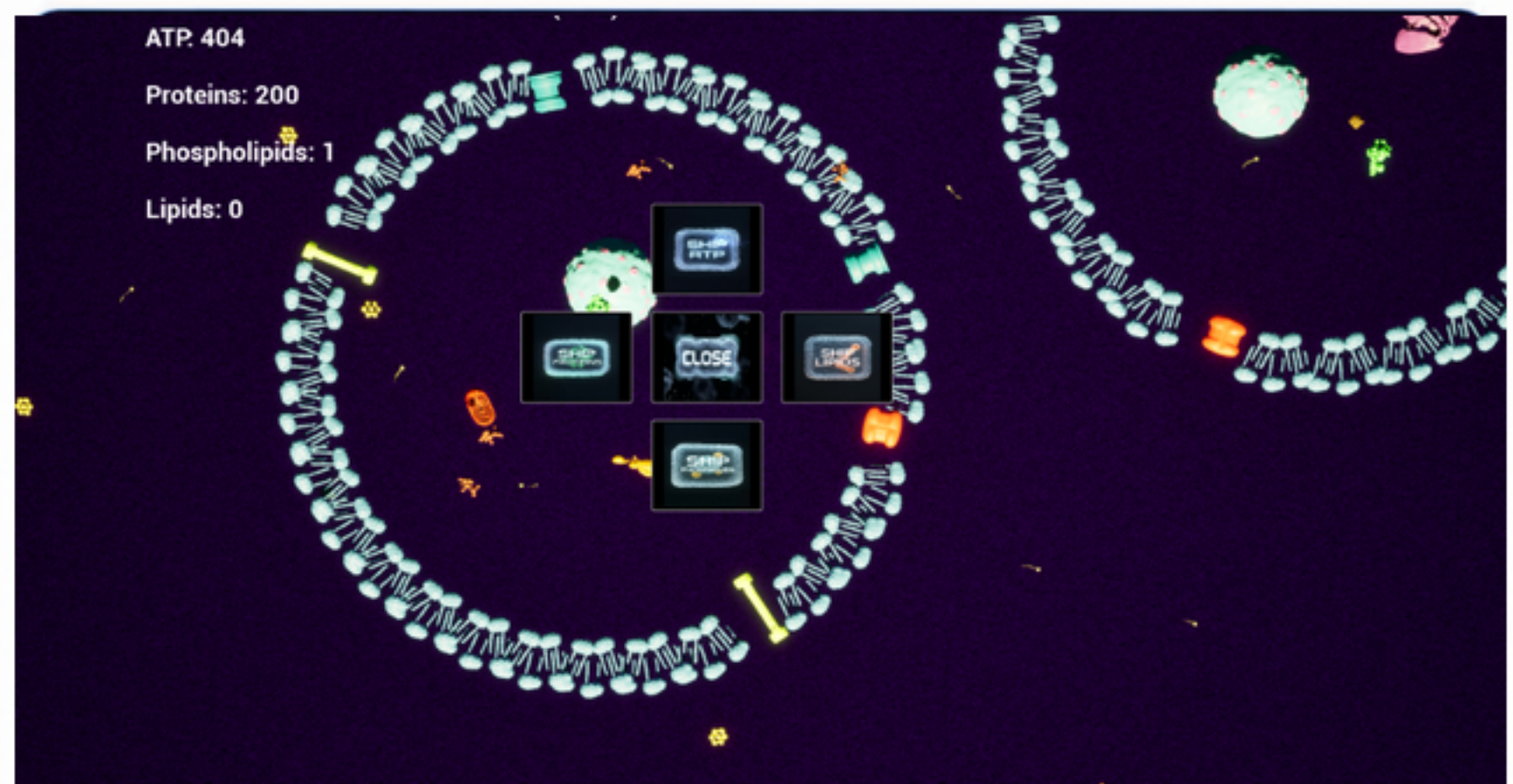
The Golgi apparatus receives materials, modifies them, sorts them, packages them, and sends them where they need to go.



2. In Cellula

In Cellula, the Golgi is orange and acts like a shipping center. It packages resources into vesicles and sends them toward the nearest cell.

This turns cell logistics into something the player can actually see: one cell can help support another by sending supplies across space.



Actual gameplay screenshot



3. What you learn

Survival is logistics. Cells must build, process, package, and deliver materials.



Cell Division and Growing Your Colony

• *More cells means more life to manage* •

Cells do not stay alone forever. Many cells grow, copy important materials, and divide to create new cells. Cell division is one way living systems grow, repair themselves, and reproduce.

Before a cell can divide, it must have enough materials and energy. It needs membrane material, proteins, genetic instructions, ATP, and working organelles. A cell that divides too early may create weak cells that are harder to keep alive.

In *Cellula*, the player can divide a cell once enough materials are available. Division creates another living cell to manage. More cells can increase your score and survival potential, but they also make the system harder to control. Each new cell needs resources, oxygen, cleanup, defenses, and maintenance.

In Cellula

Score: 2757

Cells: 2 (x2.0)

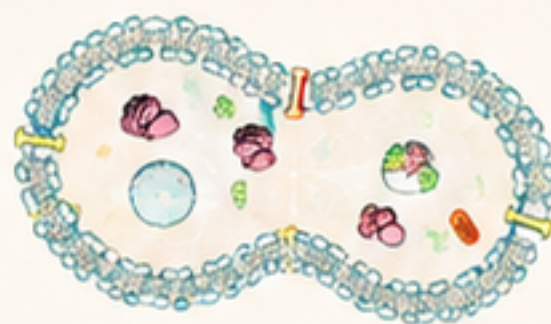


In Cellula, once a cell has enough resources, it can divide and create a second cell to manage. More cells increase your reach and score, but they also make survival more complex.

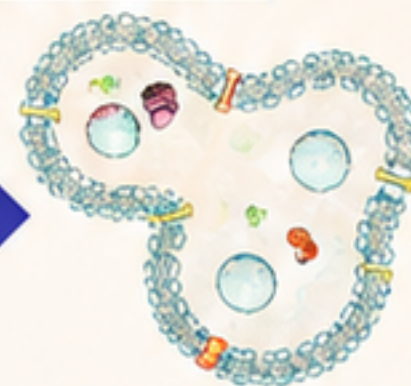
How a Cell Divides



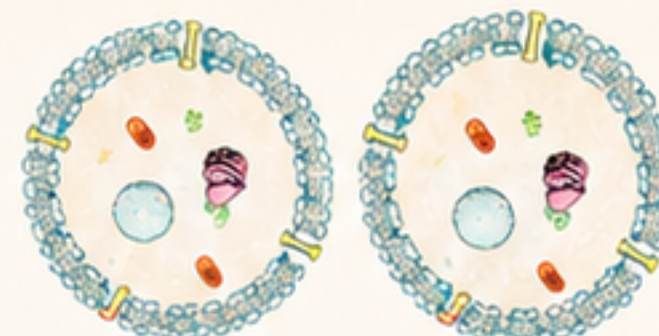
1. A healthy cell grows and copies its materials.



2. The cell stretches and the membrane begins to pinch.



3. The cell splits into two separate cells.



4. Two daughter cells are ready to grow, share, and survive.



What you learn

Growth creates opportunity and pressure.
More cells means more life, but also more systems to maintain.



Cellula is available on Steam for \$6.99.



Immune Defense and B Cells

Protection does not happen by accident

Cells live in dangerous environments. Viruses and other threats can appear around them.

In multicellular organisms, the immune system helps defend the body.

B cells make antibodies. Antibodies can bind to threats and help block or mark them.

In *Cellula*, B cells appear as large dark purple immune cells, and antibodies appear as orange-red Y-shaped structures. Viruses are bright green threats.

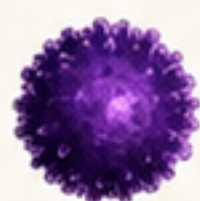
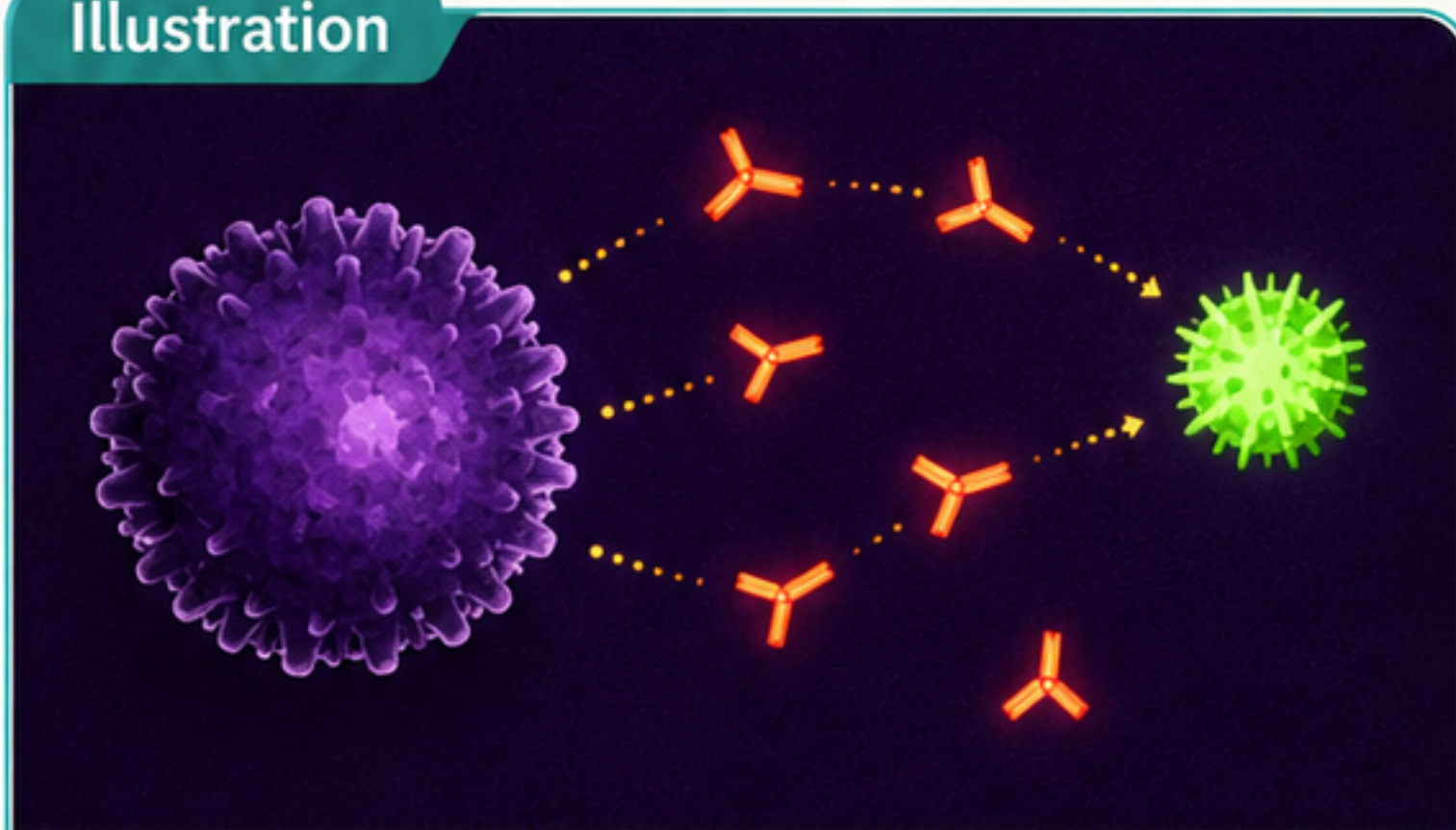
The game shows that survival depends not only on the cell itself, but also on larger defense systems around it.

In Cellula



In *Cellula*, B cells can launch antibodies at nearby viruses. This shows that immune defense is part of the larger biological battlefield around the cell.

Illustration



B cell =
large dark
purple
immune cell

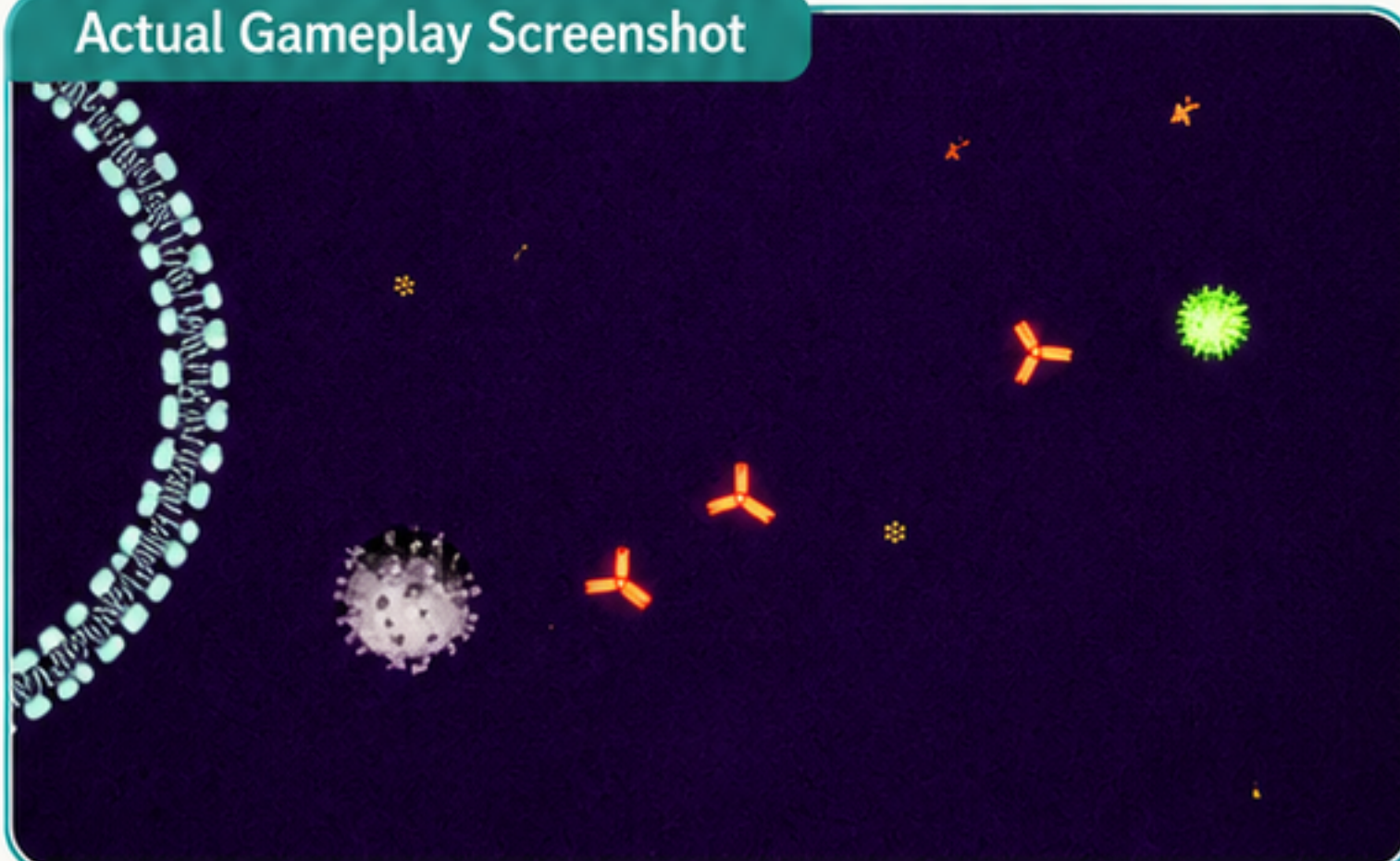


Antibodies =
orange-red
Y-shaped
proteins



Virus =
bright green
threat

Actual Gameplay Screenshot



What you learn

Cells do not survive alone. In larger organisms, defense depends on immune systems working around and between cells.



Failure, Lysis, and Game Over

What happens when the system breaks

Cells can die when their systems fail.

A cell may be damaged by infection, waste buildup, lack of energy, membrane failure, or other internal problems.

One dramatic kind of cell death is lysis. Lysis happens when the cell breaks open. The membrane fails, and the cell can no longer maintain the separation between inside and outside.

In *Cellula*, if the player cannot keep up with waste, energy needs, viral infection, or other pressures, the cell can lyse and die.

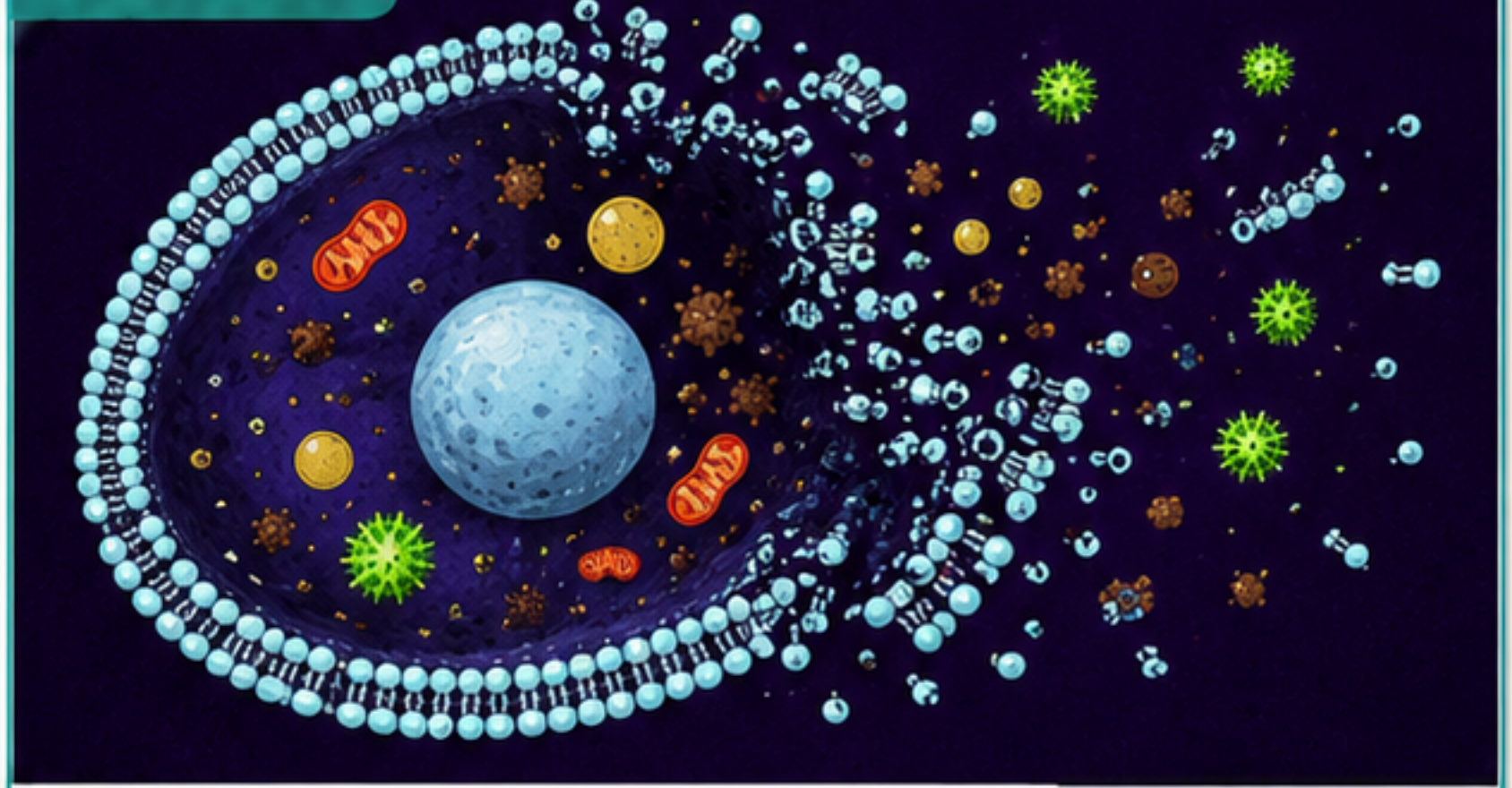
The Game Over screen is not just a failure screen. It is the result of a biological system breaking down.

In Cellula



When the cell loses control of energy, cleanup, defense, or structure, the system collapses. The game turns cell death into a visible consequence.

Illustration



Membrane rupture



Cell contents leak out



Waste escapes



Viruses spread

Actual Gameplay Screenshot



What you learn

Failure is information. When a cell dies, it shows which system broke: energy, cleanup, defense, structure, or balance.



What Cellula Teaches

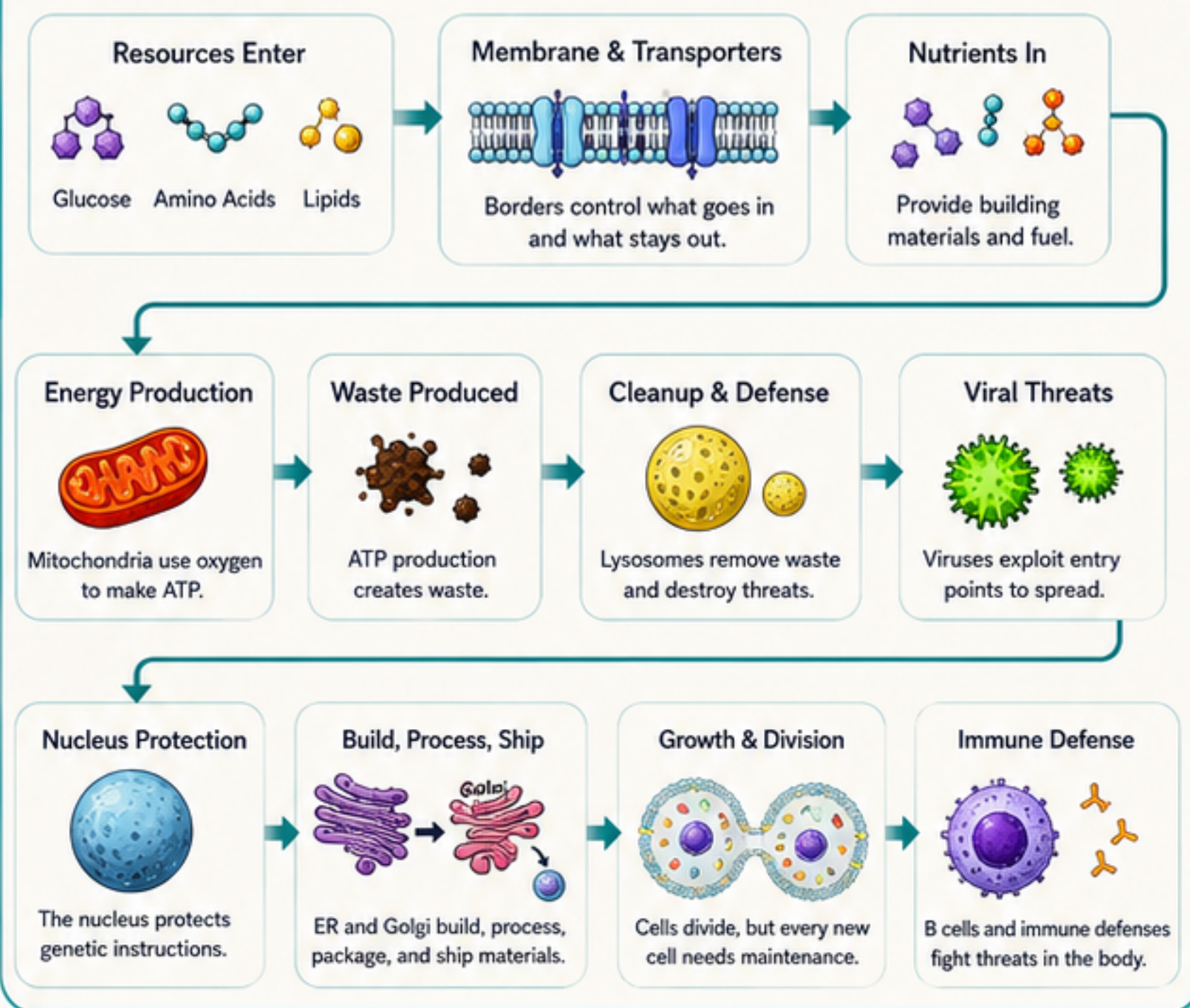
Cells are systems, not vocabulary lists

Many people first learn cells by memorizing organelle names. But a living cell is not a list. It is a system.

- The **membrane** controls borders.
- **Transporters** bring in specific resources.
- **Nutrients** provide building materials and fuel.
- **Mitochondria** use oxygen to make ATP.
- ATP production creates waste.
- **Lysosomes** clean waste and destroy threats.
- **Viruses** exploit entry points.
- The **nucleus** protects genetic instructions.
- The ER and Golgi build, process, package, and ship materials.
- Cells divide, but every new cell needs maintenance.
- Immune defenses help fight threats in the larger organism.

In *Cellula*, the game turns these ideas into gameplay. You see oxygen become necessary for ATP. You see waste become dangerous if not removed. You see viral material threaten the nucleus. You learn through the living loop, not through memorization.

Illustration



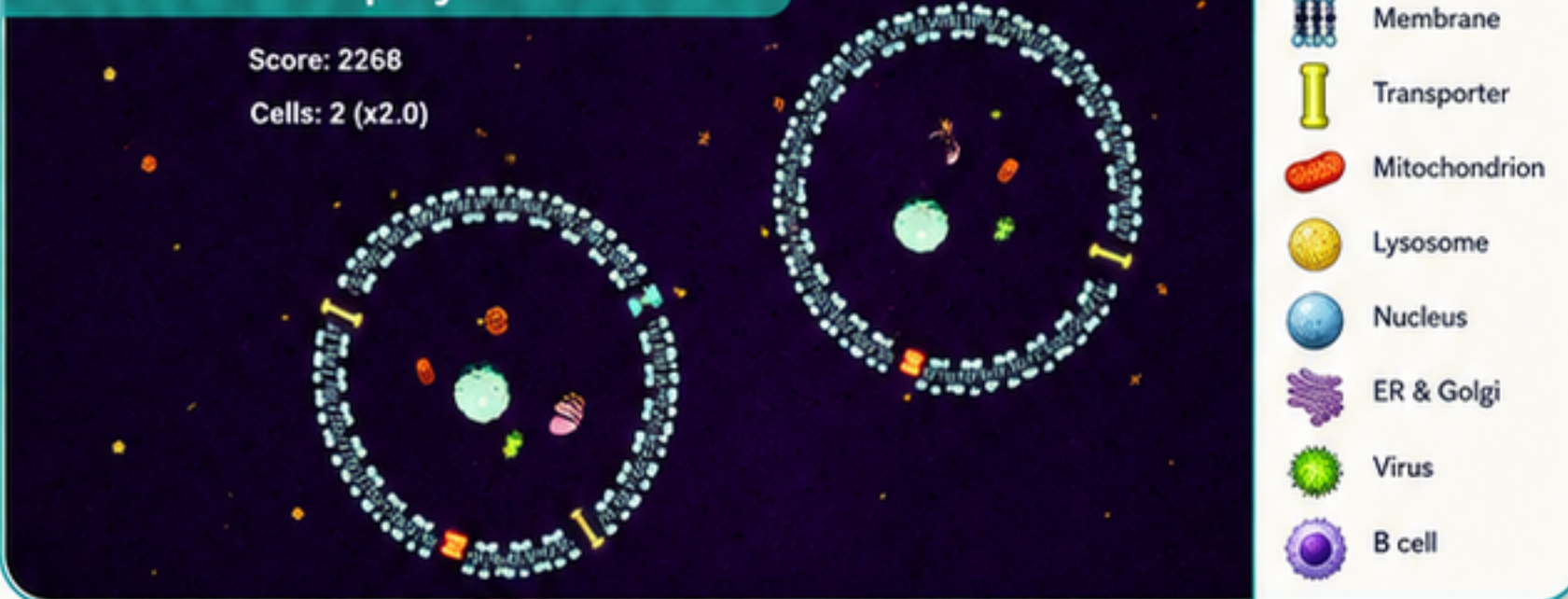
“Do not just name the parts.
Understand the loop.”

In Cellula



Cellula teaches through interactive systems. You connect cause and effect, make strategic choices, and see how every part works together to help the cell survive.

Actual Gameplay Screenshot



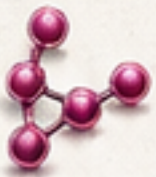
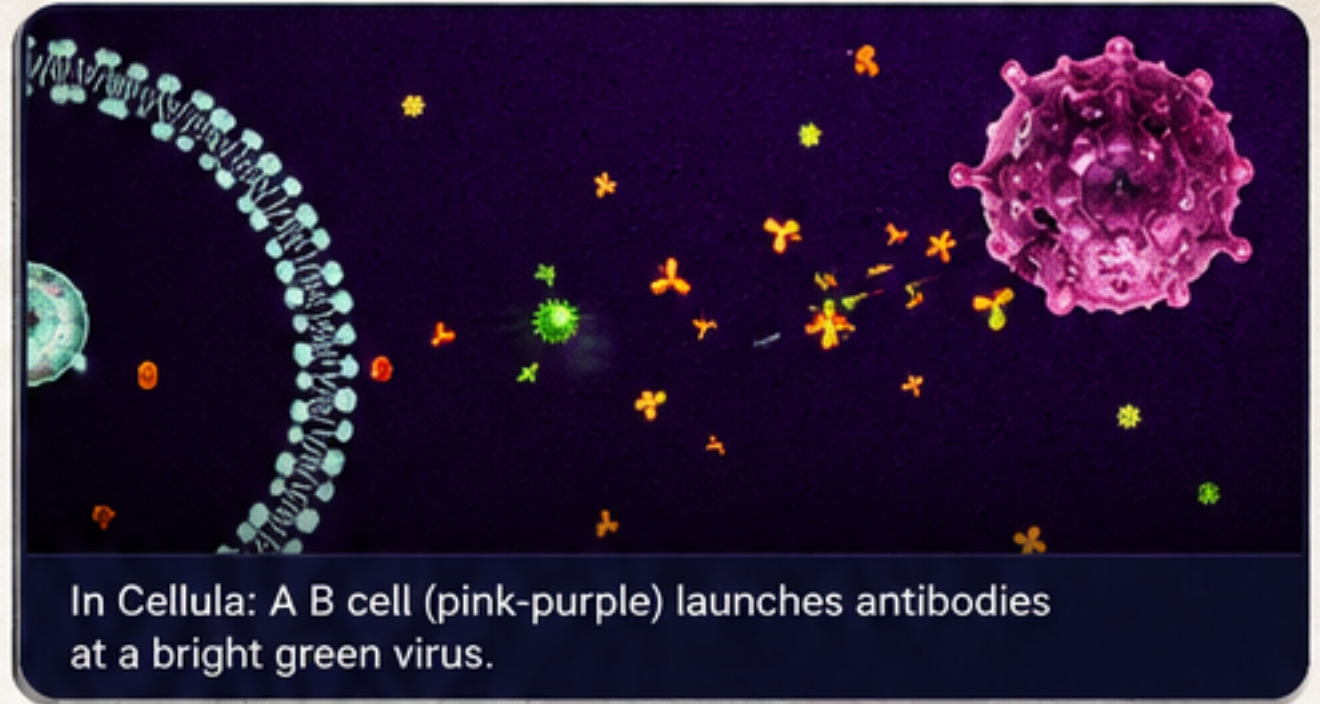
What you learn

Biology is not just memorization.
Biology is systems thinking.



Glossary

Simple definitions for important cell terms



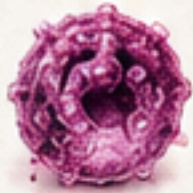
Amino acids

Small molecules used as building blocks to make proteins.



ATP

The cell's main usable energy molecule. Cells use ATP to power many activities.



B cell

An immune cell that can help defend the body, including by producing antibodies.



Cell membrane

The flexible boundary around the cell. It controls what enters and leaves.



Cell lysis

The breaking open of a cell. If a cell lyses, it dies.



DNA

The molecule that stores genetic instructions.



Electron transport chain

A series of reactions inside mitochondria that helps produce ATP. Oxygen accepts electrons at the end of this chain.



Endoplasmic reticulum (ER)

An organelle system involved in making and processing proteins and lipids.



GLUT1

A glucose transporter in the cell membrane. In Cellula, it can also become a dangerous docking point for viruses.



Glucose

A sugar molecule cells can use as fuel.



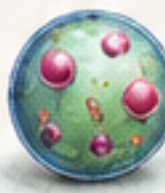
Golgi apparatus

An organelle that modifies, sorts, packages, and ships cellular materials.



Lipid

A fat-like molecule. Lipids are important for membranes and cell structures.



Lysosome

An organelle that breaks down waste, damaged parts, and unwanted material.



Mitochondrion

An organelle that helps make large amounts of ATP using fuel and oxygen.



Nucleus

The protected information center of the cell. It stores most of the cell's DNA.



Oxygen (O₂)

A molecule used by mitochondria at the end of the electron transport chain. It helps ATP production continue efficiently.



Phospholipid bilayer

The double layer of phospholipids that forms the main structure of the cell membrane.



Protein

A molecule that performs many jobs in cells, including structure, transport, signaling, and chemical reactions.



Receptor

A structure that can bind or respond to a specific molecule. Some viruses exploit receptors to enter cells.



Ribosome

A structure that helps build proteins.



Virus

An infectious particle that must enter a living cell to make more copies of itself.



WHAT YOU LEARN

Cell words are easier to remember when you understand what the parts do.

Play Cellula on Steam.
Available for **\$6.99**



Play Cellula

Learn the cell by keeping one alive

Cellula turns cell biology into a playable survival system. You're not just reading about the cell—you're in it.

Manage oxygen, ATP, nutrients, lysosomes, viruses, membranes, organelles, and cell division as you try to keep your cells alive and thriving.



REAL CELL BIOLOGY

Every system is inspired by real science—membranes, organelles, molecules, and immune responses.



SURVIVAL STRATEGY

Balance resources, respond to threats, and adapt to a constantly changing environment.



IMMUNE DEFENSE

Deploy B cells and antibodies to fight viruses and protect your cells.



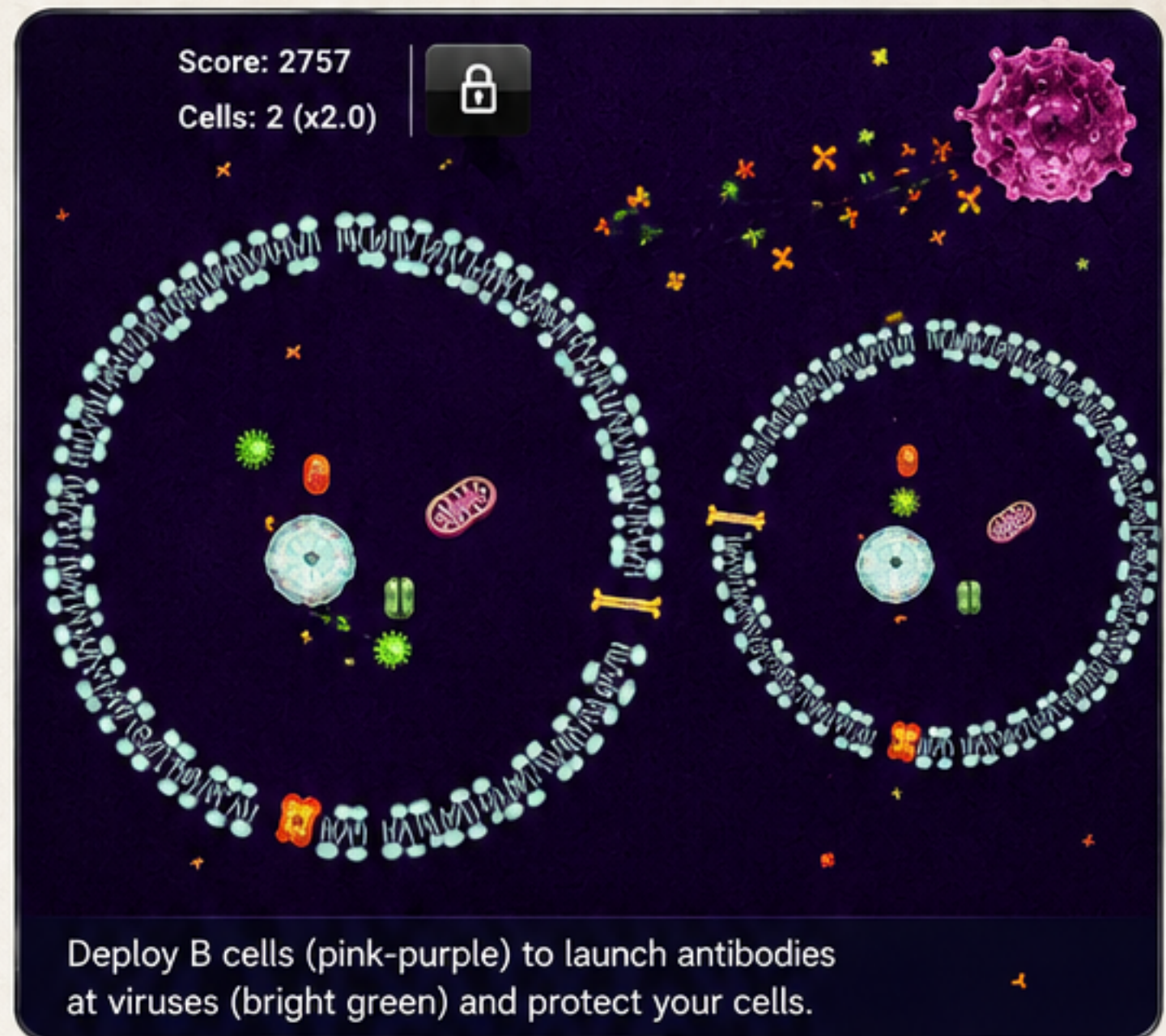
GROW AND DIVIDE

Build new cells through mitosis and expand your colony.



LEARN BY DOING

Turn complex cell concepts into intuition through gameplay.



AVAILABLE ON
STEAM®

Available on Steam for

\$6.99

<https://store.steampowered.com/app/4853070/Cellula/>



SCAN ME



GREAT FOR

Students, teachers, curious minds, and anyone who wants to really understand how cells work.



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