Cell Theory

It’s history and cell cycle

History of Cell Theory

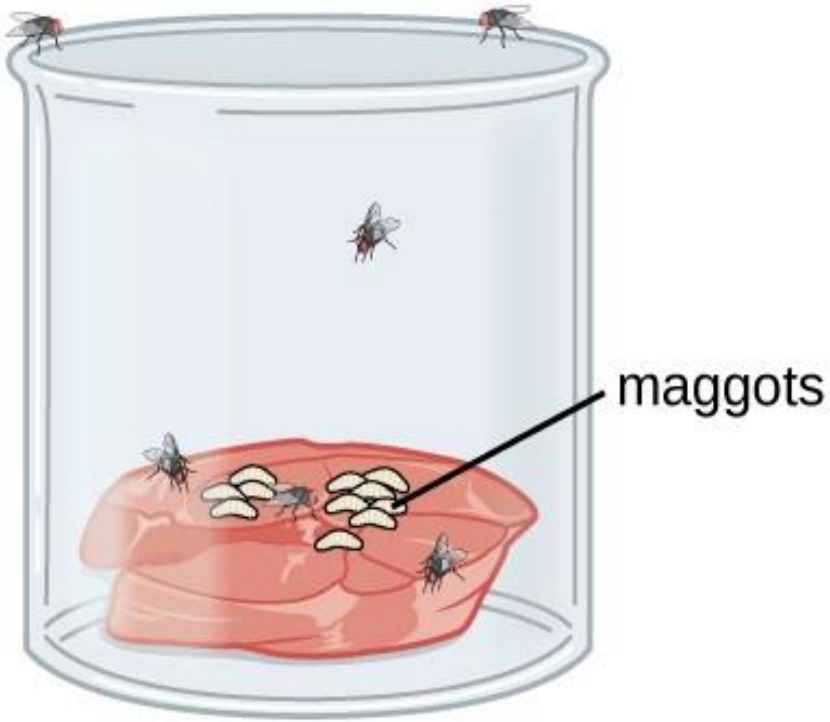
- It was once believed that spontaneous generation could turn non-living things into simple living things.
- These observations were not made through the scientific method but by untested observation.

History of Cell Theory

- For example, it was once believed that if you left mouldy grain out, it would spontaneously turn into mice.
- Therefore it was concluded that mouldy grain turned into mice.
- Today we know that the thatched roofs used in the past would leak and the water would spoil the grain and attract the mice.

History of Cell Theory

- An example of spontaneous generation that did get tested was the belief that rotting meat would spontaneously turn into flies.
- In 1668, Francesco Redi did an experiment with flies and wide-mouth jars containing meat.
- He used two jars of meat; one was covered with a fine mesh and the other was left open.
- Flies could only get into the open jar and after a brief period of time, maggots and eventually flies were found in the open jar.

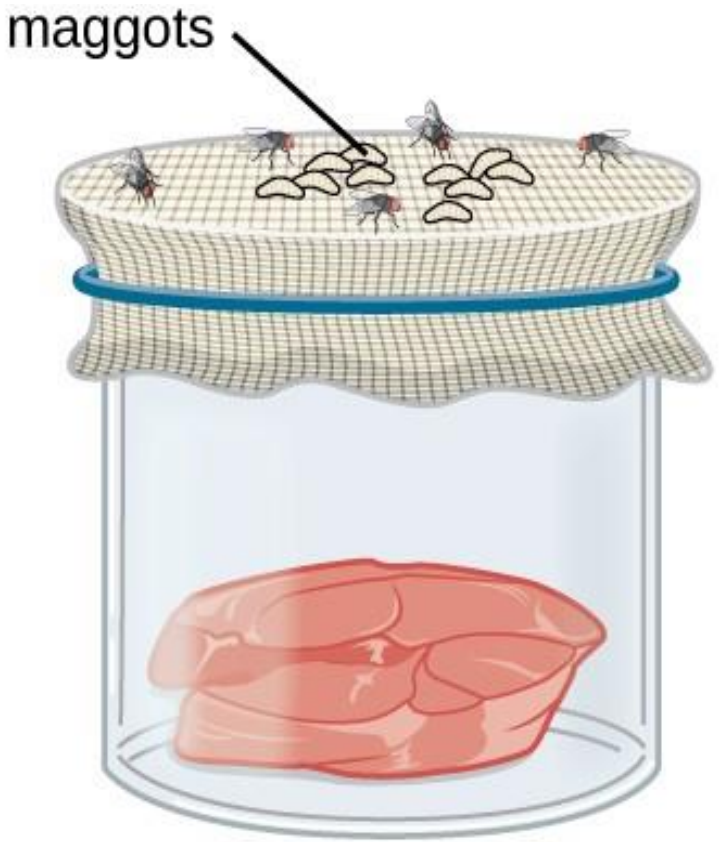


open container

formation of maggots in meat

cork-sealed container

no formation of maggots in meat



gauze-covered container

no formation of maggots in meat

History of Cell Theory

- However, flies and maggots were not found in the jar covered by the mesh.
- He was able to conclude that the rotting meat in the covered jar did not spontaneously generate flies, whereas the open jar that had flies continued to have more flies over time.
- He was able to conclude that flies come from flies and not from rotting meat.
- Therefore, living things come from other living things; it was the first step into developing the cell theory.

History of Cell Theory

- Around the same time as Redi, Robert Hooke, using his new microscope, observed the structure of plant cell walls and he was the first to use the term ‘cells’.
- In 1838, Matthias Schleiden and Theodore Schwann were looking at tissues with their microscopes.
- They were able to determine that all living things were made up of cells.

History of Cell Theory

They eventually developed the first cell theory:

1. All living things are composed of one or more cells.
2. Cells are the basic structural and functional units of life.

Modern Cell Theory

- It was through the earlier work of Redi, Hooke, Schleiden, and Schwann that Rudolf Virchow was able to complete the cell theory.
- Since he was a doctor of medicine, he was interested in human disease.
- Through the use of a microscope he was able to observe cells dividing.

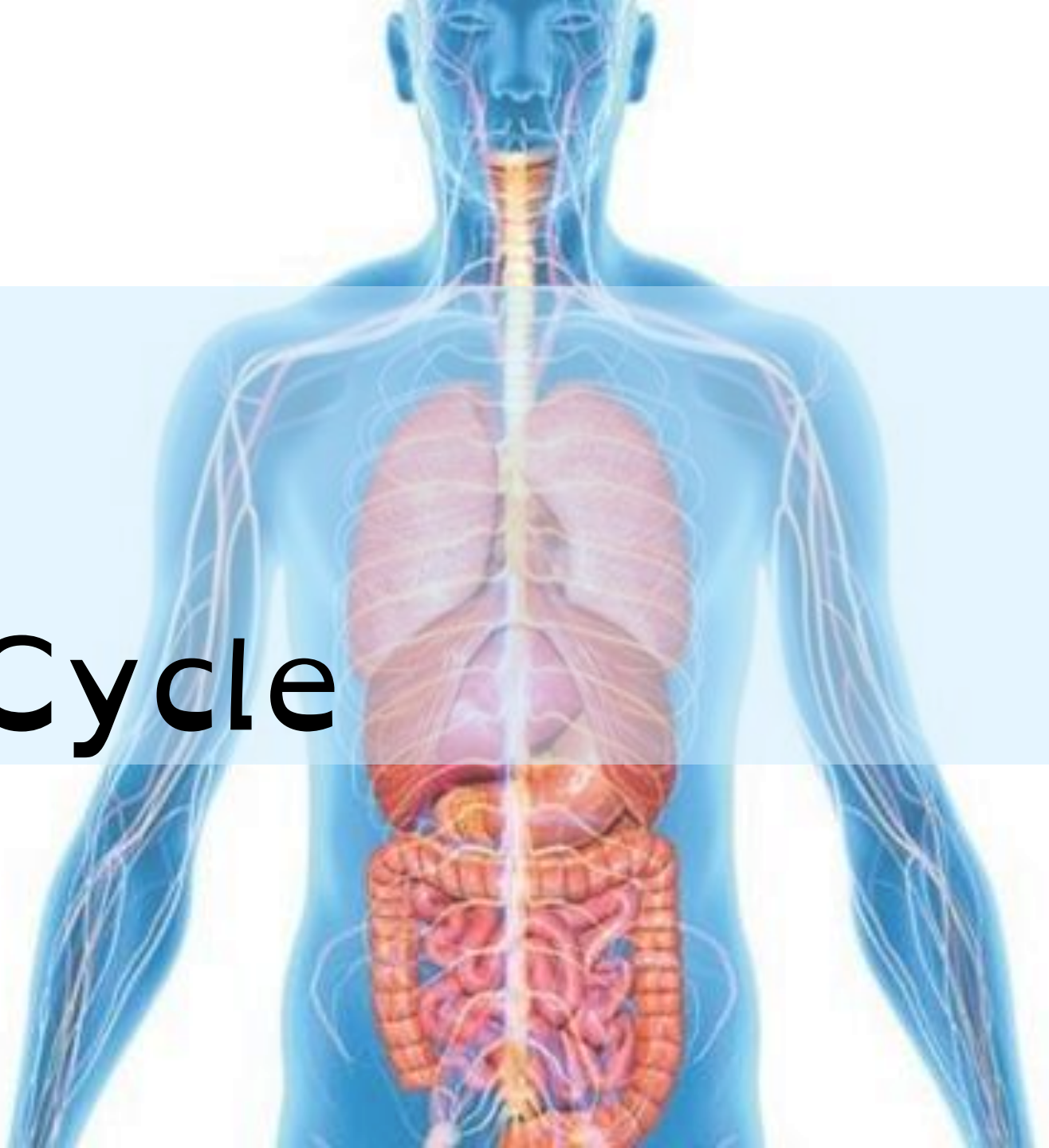
Modern Cell Theory

He further modified the cell theory to create the modern cell theory that now states:

1. All living things are composed of one or more cells.
2. Cells are the basic structural and functional units of life.
3. All cells come from the division of other cells.

THE WACKY HISTORY OF CELL THEORY

Cell Cycle

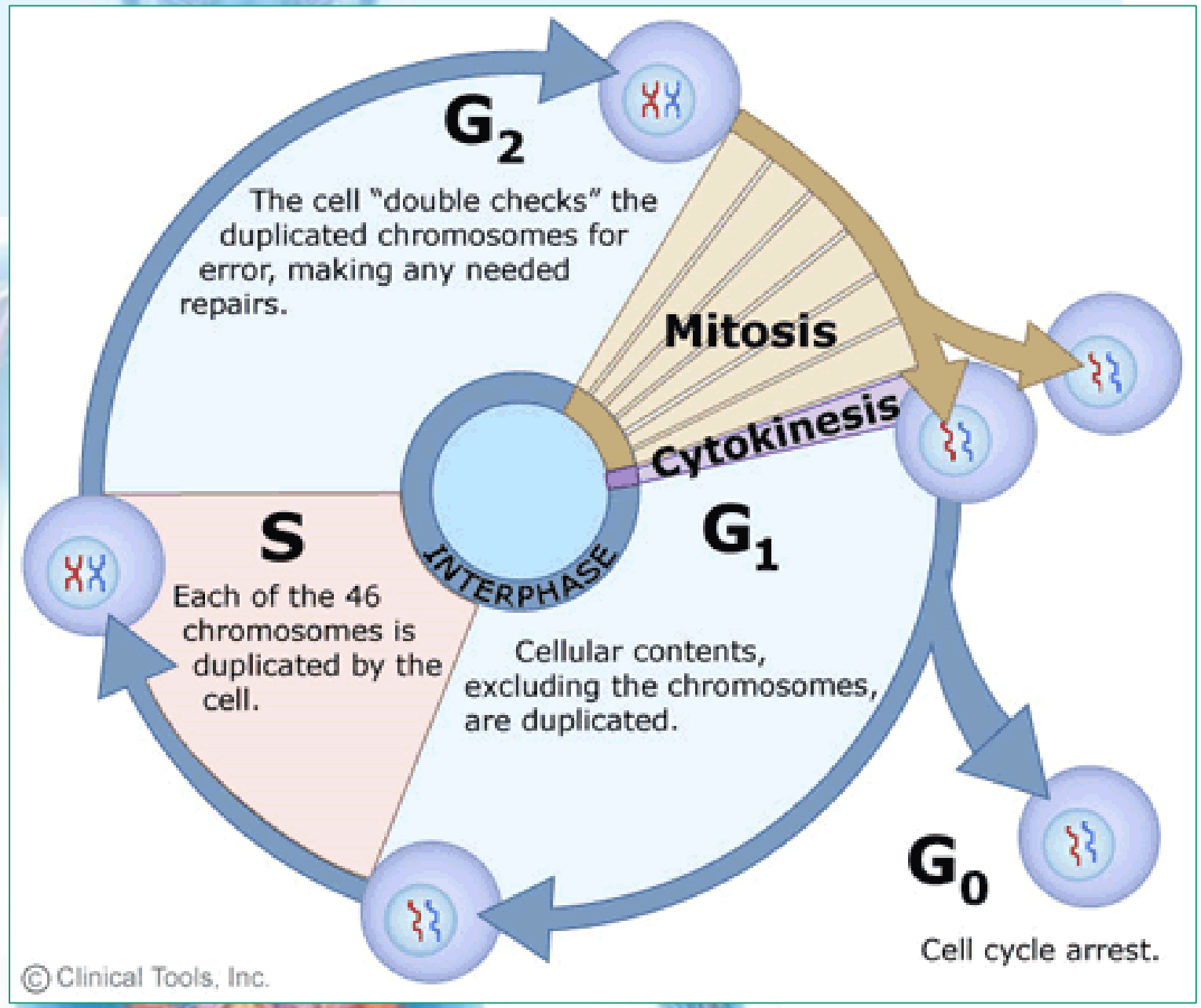


Cell Cycle

- The entire life of the cell is called the cell cycle.
- Within the human body the cell cycle happens in every cell, except nerve cells after the age of three.
- In plant cells, the cell cycle occurs in specialized parts called meristem located in the tips of roots and shoots.

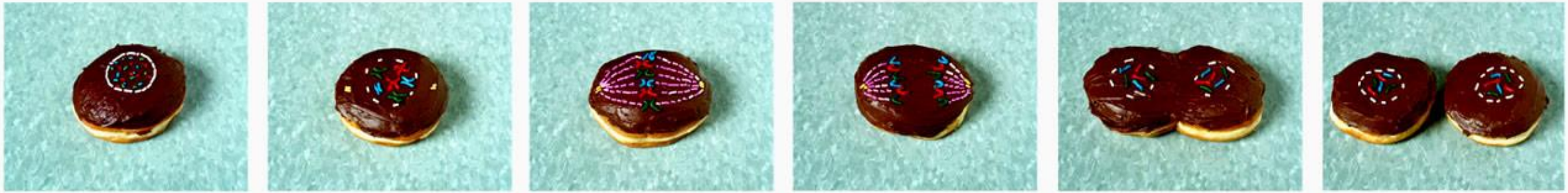
Cell Cycle

- The cell cycle can last about 24 hours.
- There are two major phases in the cell cycle, interphase and mitosis.
- The period between divisions is known as interphase and takes the majority of time.
- The second part is cell division or mitosis and lasts about one hour.



Cell Cycle

- All animal cells undergo a process by which they duplicate to create new cells. This process is what we refer to as the cell cycle - Mitosis.
- During the cell cycle, the cell grows, performs its specialized functions and then creates an exact copy of itself.
- This is a very important process, because this is how we grow and how our tissues get repaired.



Cell Cycle and Mitosis

The cell cycle consists of three stages:

- 1. Interphase, which is where cells grow, perform their functions and replicate DNA;
- 2. Mitosis, which is the process of cell division;
- 3. Cytokinesis, which is the final splitting into two genetically identical cells.

- Since Mitosis is a complex process, it is broken down into four phases: Prophase, Metaphase, Anaphase and Telophase.

New Skill

- Watch the video on the next slide and learn how to take Cornell notes.
- You will use them on the next video that is set in small chunks for you to practise this skill
- It is the stages of mitosis!!

How To Take Cornell Notes


Mitosis
with the Amoeba Sisters

Title: Mitosis

Key Points	Details
- Growing - Repairing - Mitosis is cells dividing	- Bandage heals cut - Nails get longer - Body growing - Mitosis is in common with all of these things - Making more cells - Repairing cells

Summary

Mitosis is cell division. It is important for my body to grow and repair itself.

Are you able to identify the cells when they were in Interphase, Mitosis and Cytokinesis?

Task

- Login into Explorelearning.com
- Use your board email account and password (it is the easiest to remember for the future.
- Complete the Cell Cycle Gizmo.

ZRBCQT

Class Enrollment Code