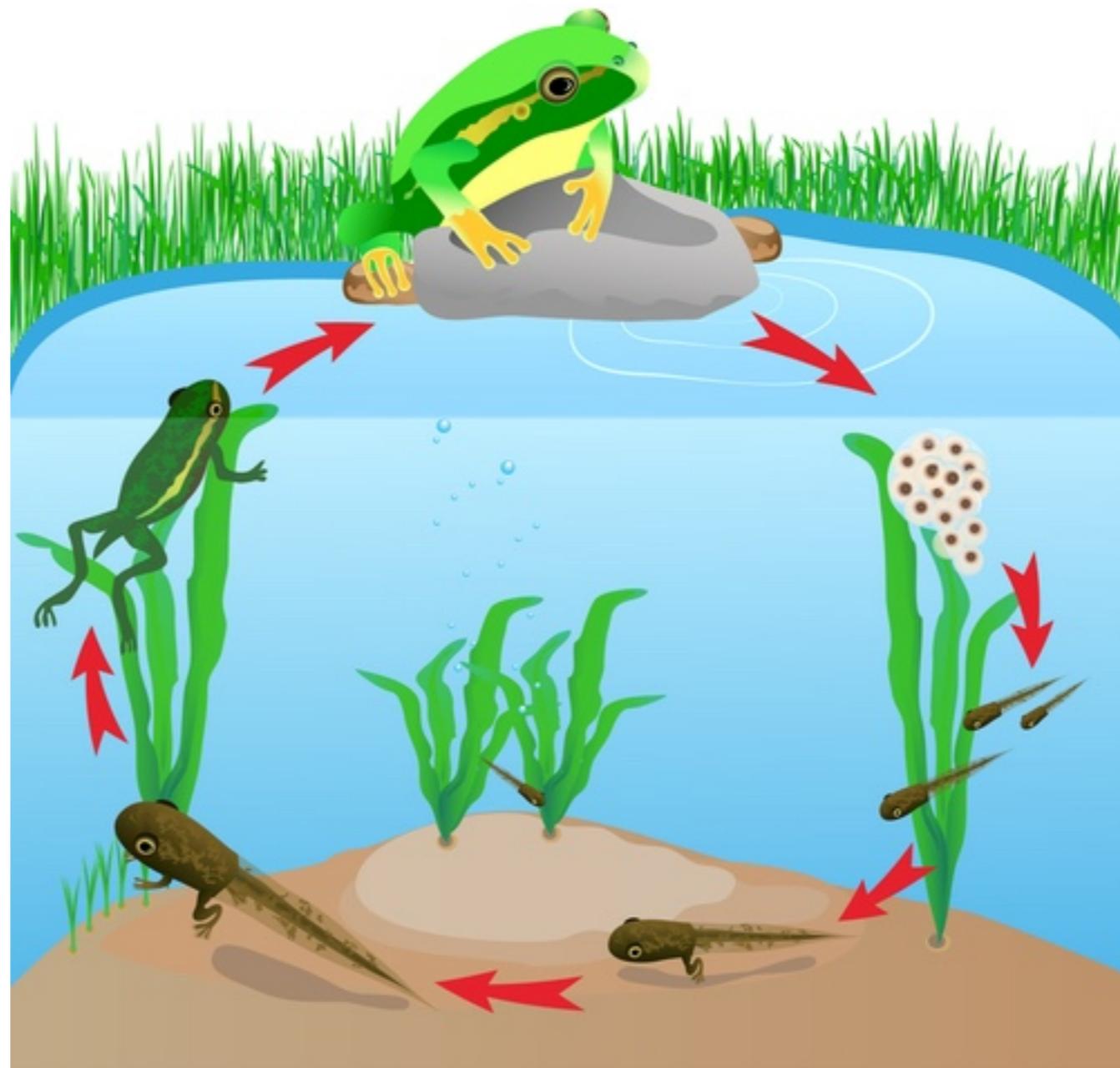


Cell Cycle

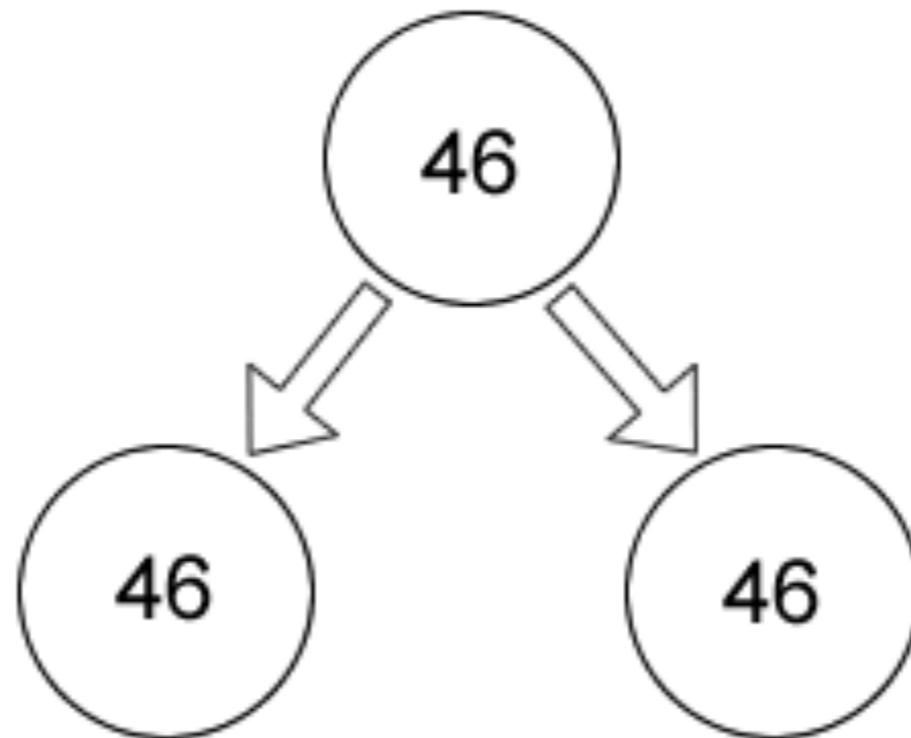
Cell Life Cycle

- Just like the life cycle of plants and animals, cells have a life



Cell Division

- The goal of the cell life cycle is to create more identical cells.
- In humans, a cell with 46 chromosomes will divide into two daughter cells, both with 46 chromosomes.



4 Phase Life Cycle

Normal Cell Life

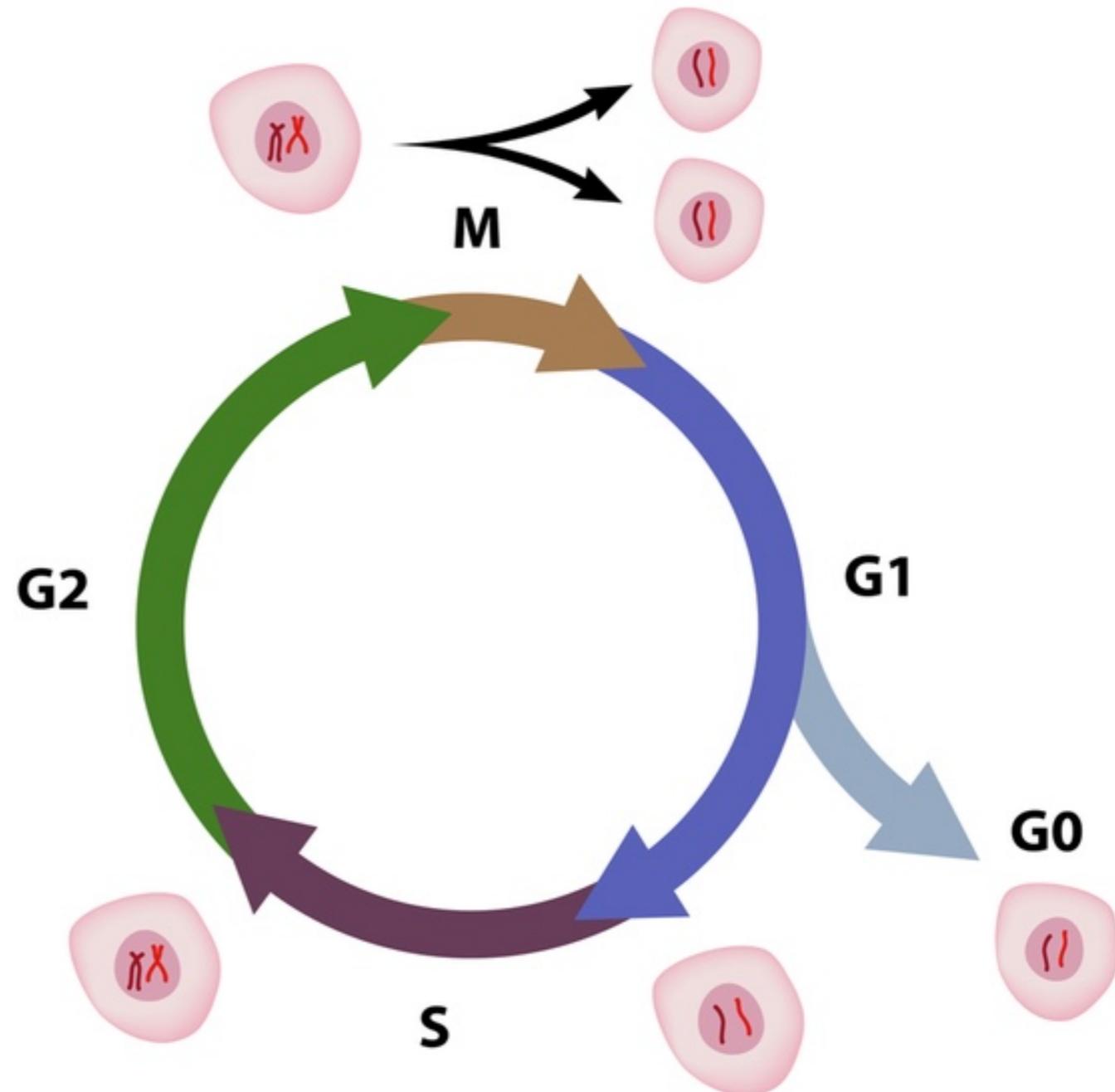
1. G1 (gap 1)

Cell Division

2. S (synthesis)

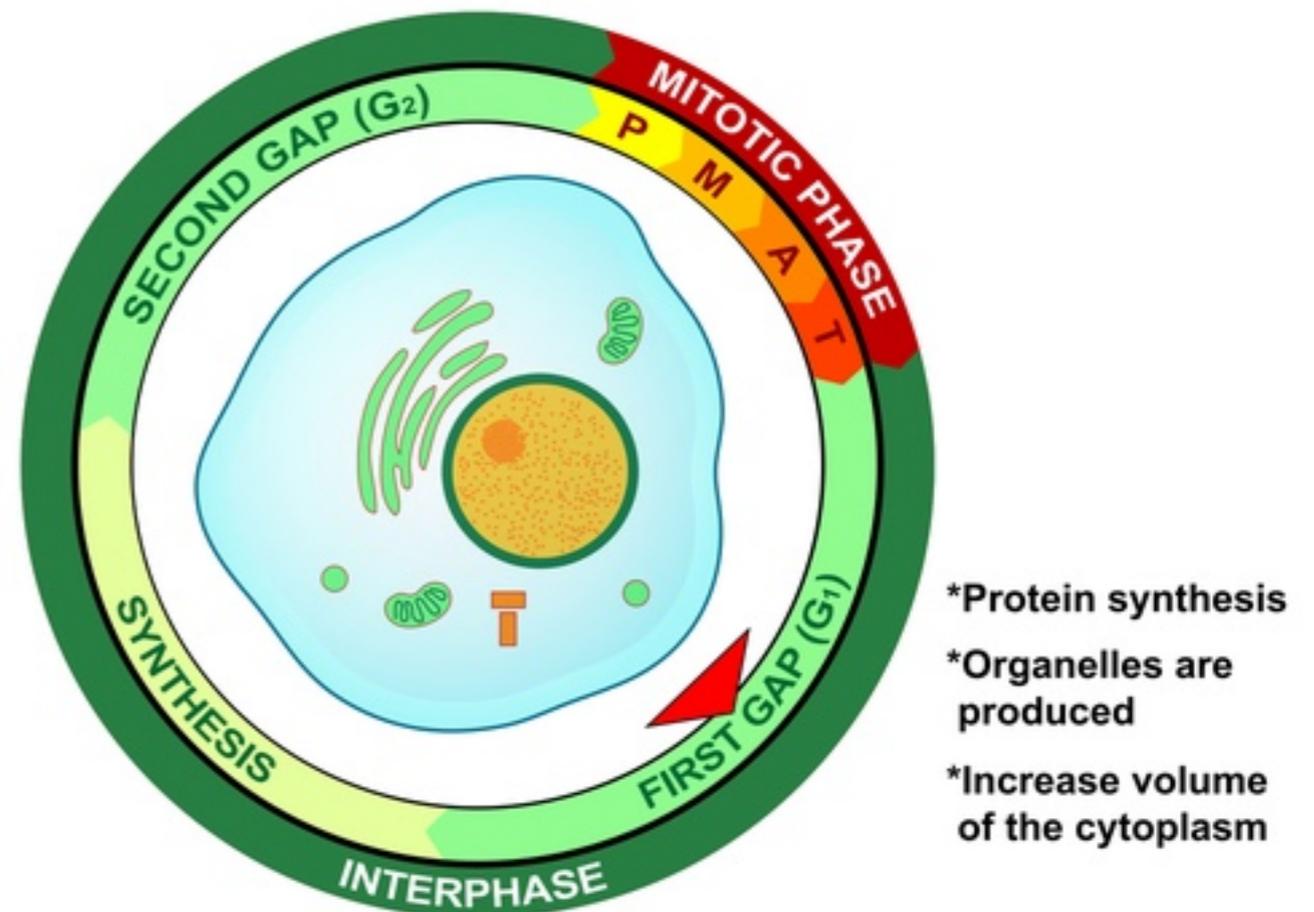
3. G2 (gap 2)

4. M (mitosis)



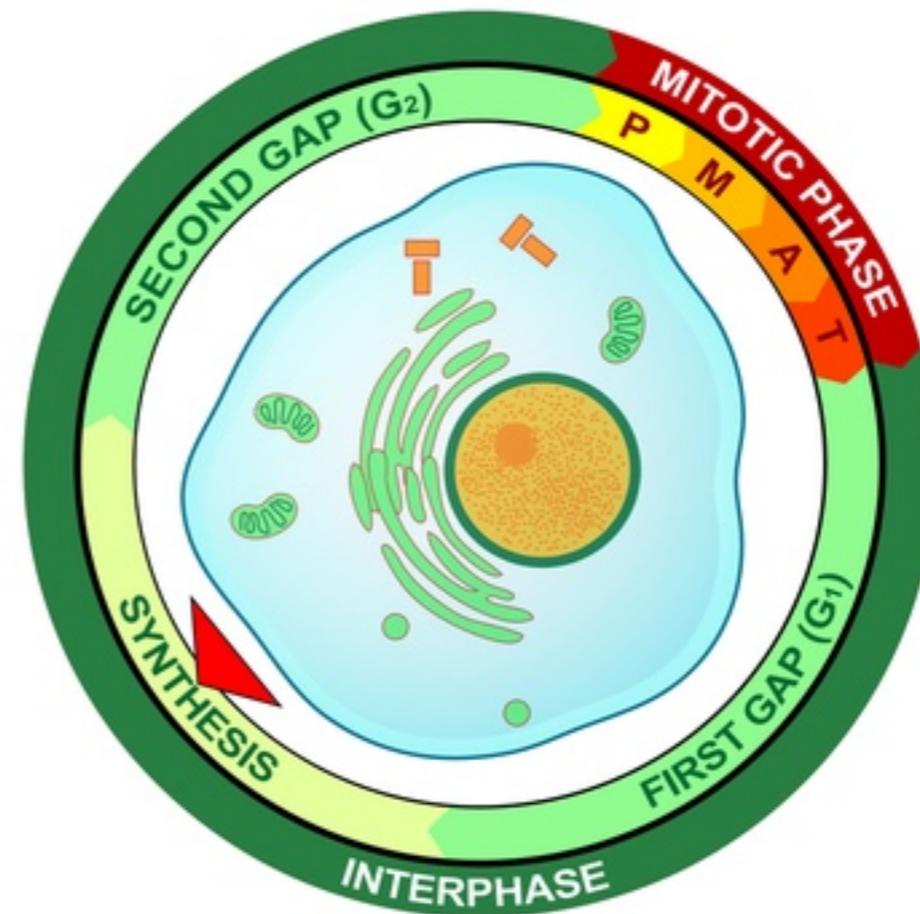
G1 Phase

- The cell grows larger in size = increases its surface to volume ratio
- This phase is normal cell life.



S Phase

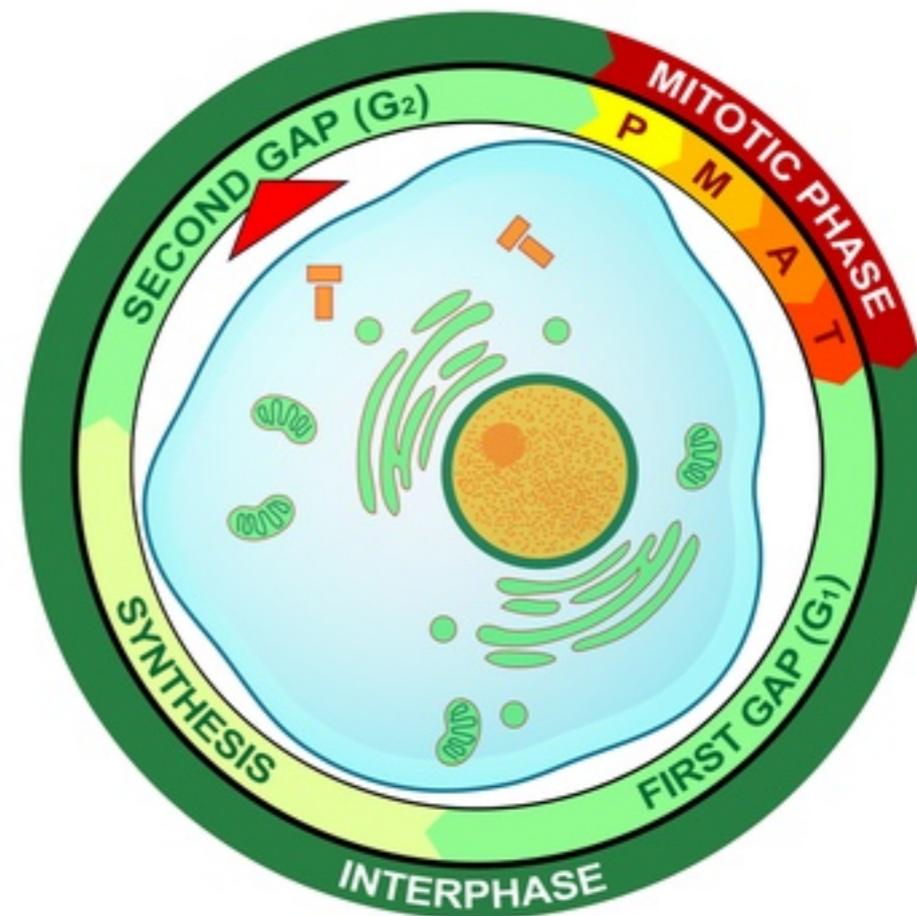
- DNA is synthesized, meaning DNA is copied.
- Cell performs DNA replication.



*Cell duplicates its DNA

G2 Phase

- Cell prepares to mitosis.
- Cell duplicates organelles.



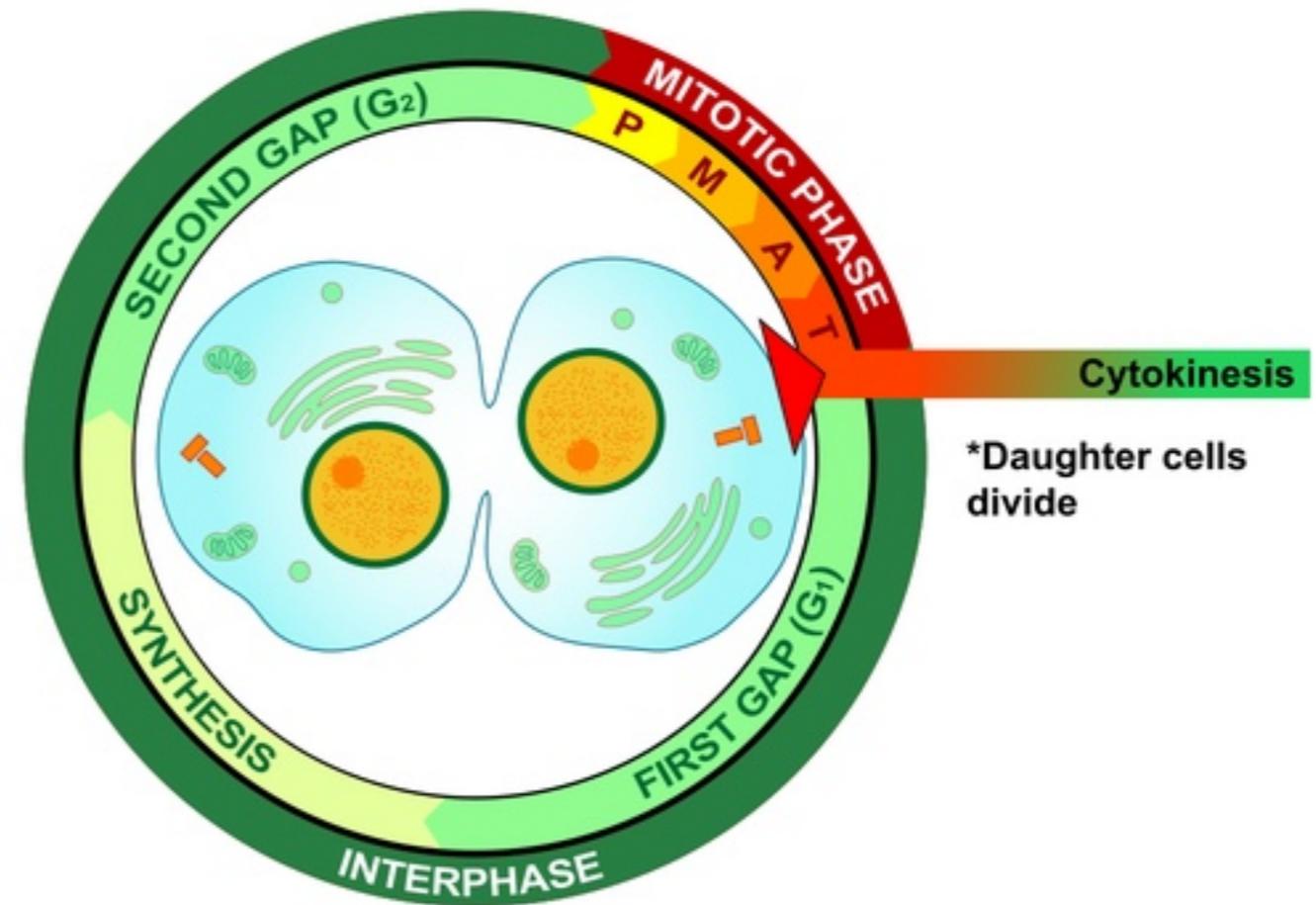
*Organelles are produced
*Increase volume of the cytoplasm

Question

- What phase comes next?

M Phase

- M phase = Mitosis
- Mitosis is all about cell division.

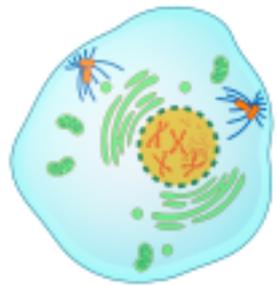


Question

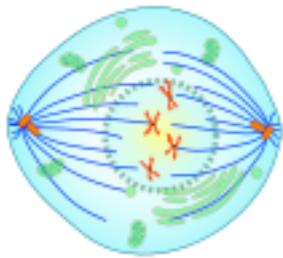
- What are the names of the phases in mitosis?

Mitosis

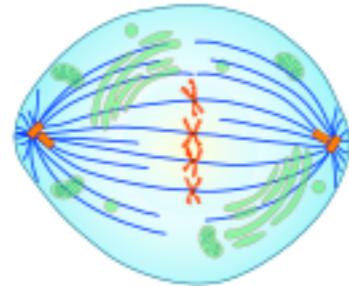
- Mitosis is made up of four stages and then the cell divides.
 1. Prophase
 2. Metaphase
 3. Anaphase
 4. Telophase
 5. Cytokinesis = cell divides



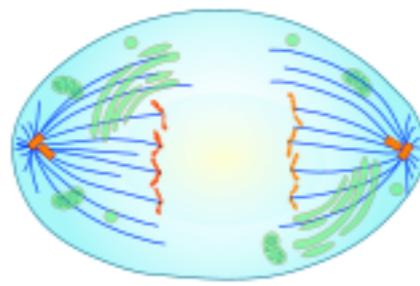
Prophase



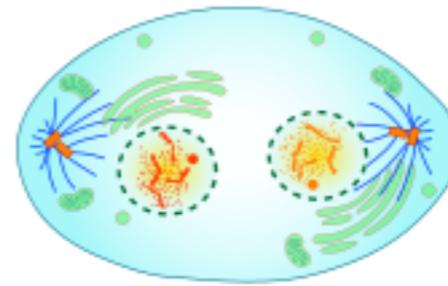
Metaphase



Anaphase



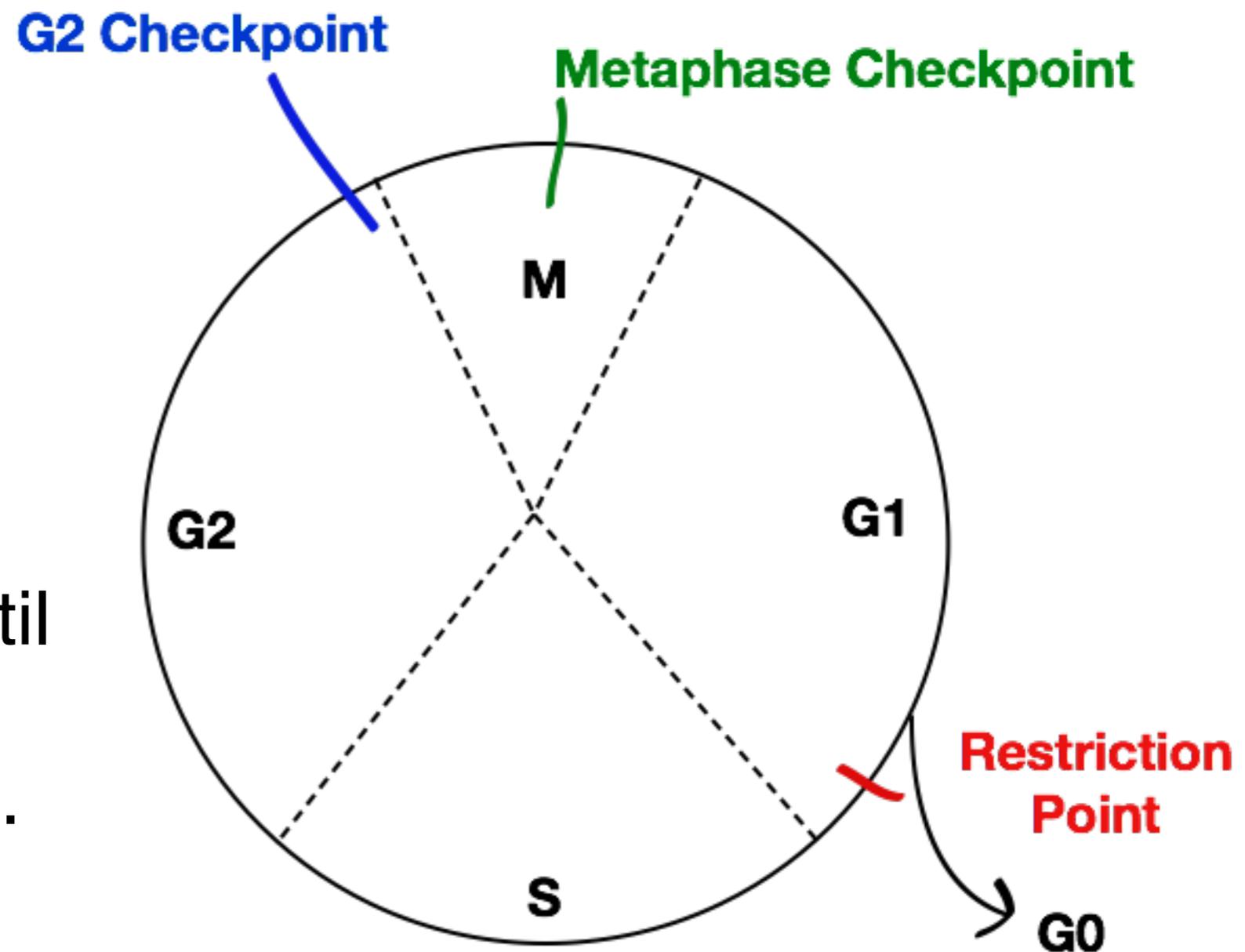
Telophase



Cytokinesis

Control System

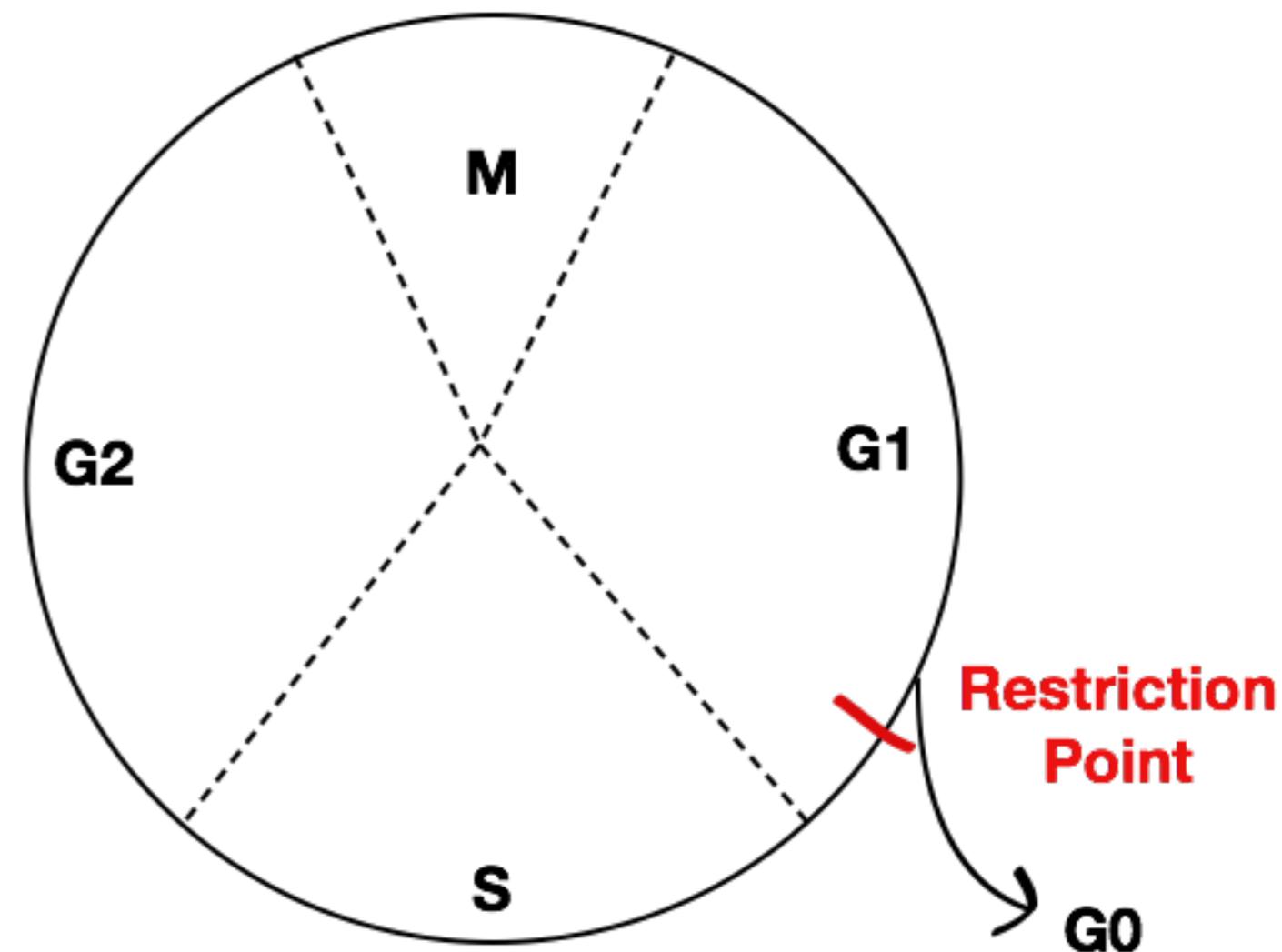
- The cell cycle is regulated by 3 checkpoints.
- A checkpoint is when the cell cycle stops until go-ahead signal molecules are present.



Checkpoint 1

- The 1st checkpoint is called the restriction point and it determines if the cell will divide.

1. Restriction Point

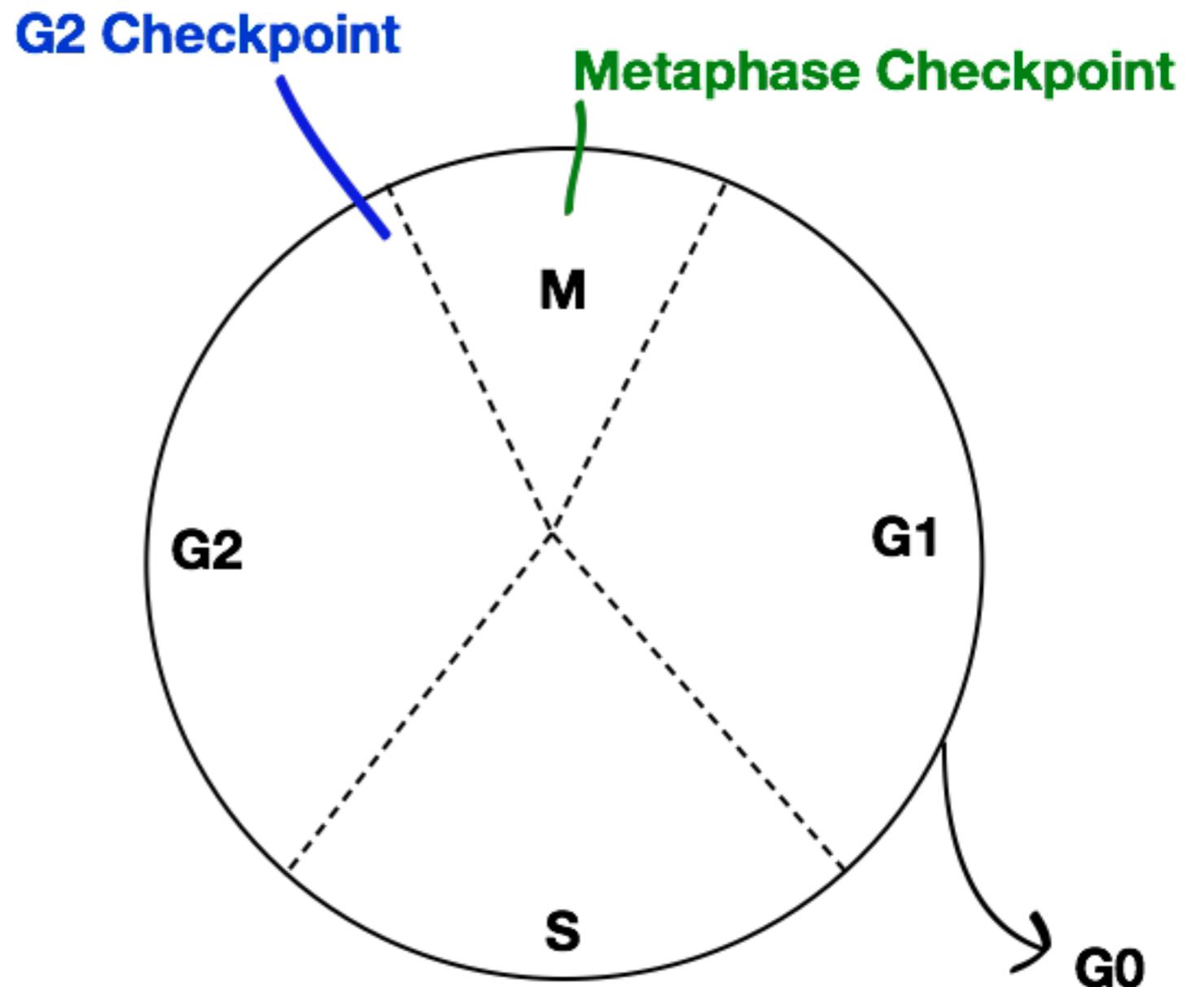


Checkpoints 2 & 3

- The other two checkpoints makes sure cell division is functioning properly.

2. G2

3. Metaphase

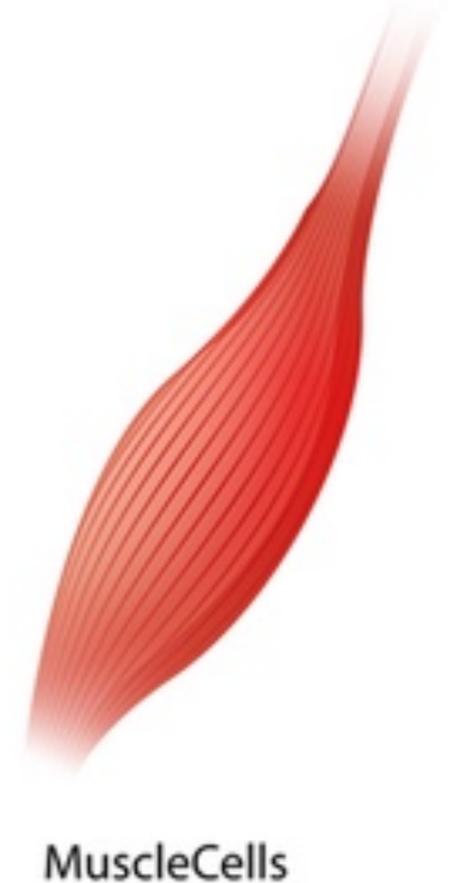
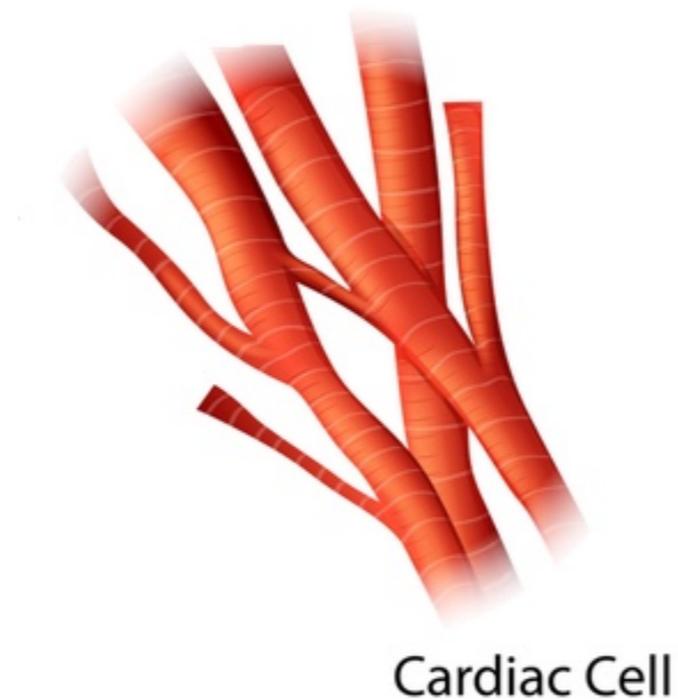
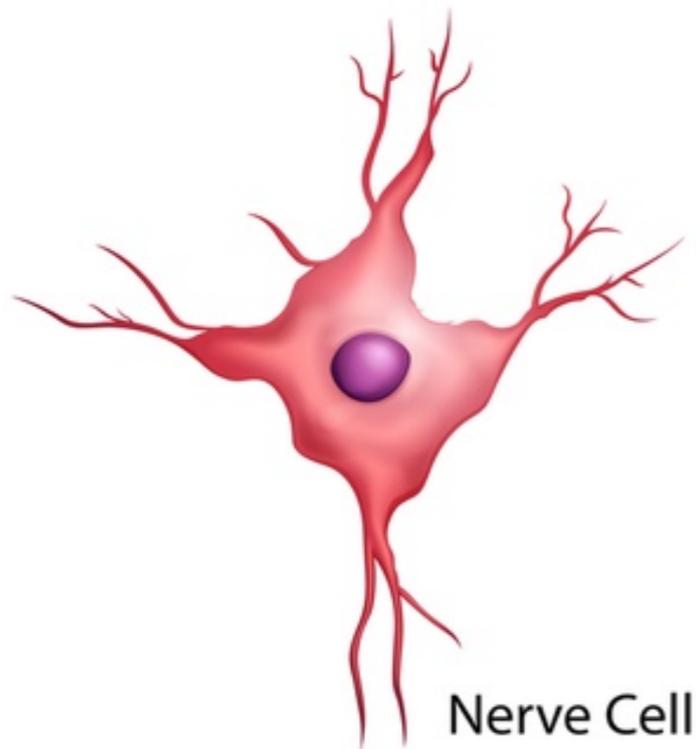


Question

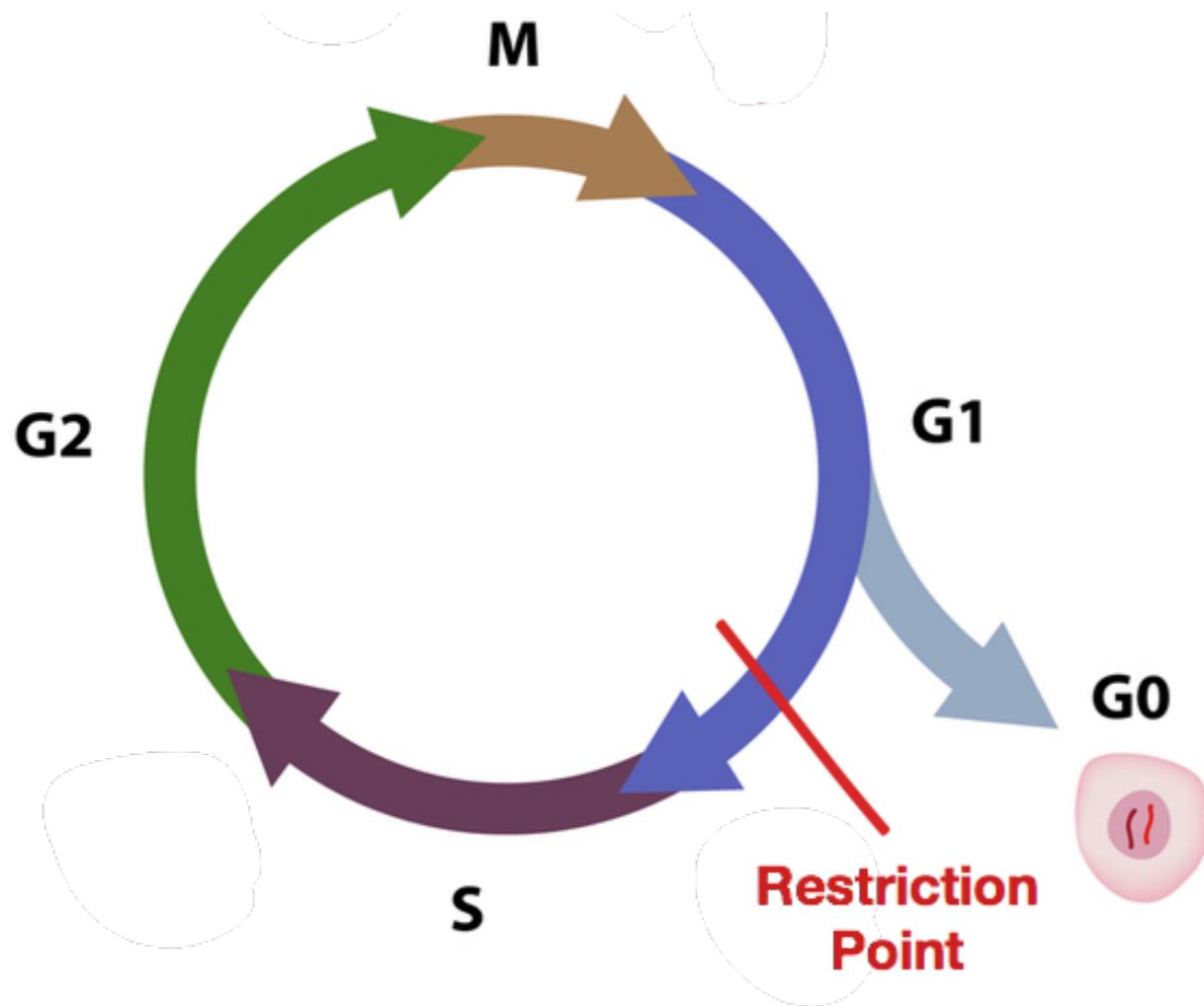
- Do all of the cells in your body divide?

Differentiated Cells

- Most of the cells in your body do NOT divide.
- Differentiated cells are specialized cells.



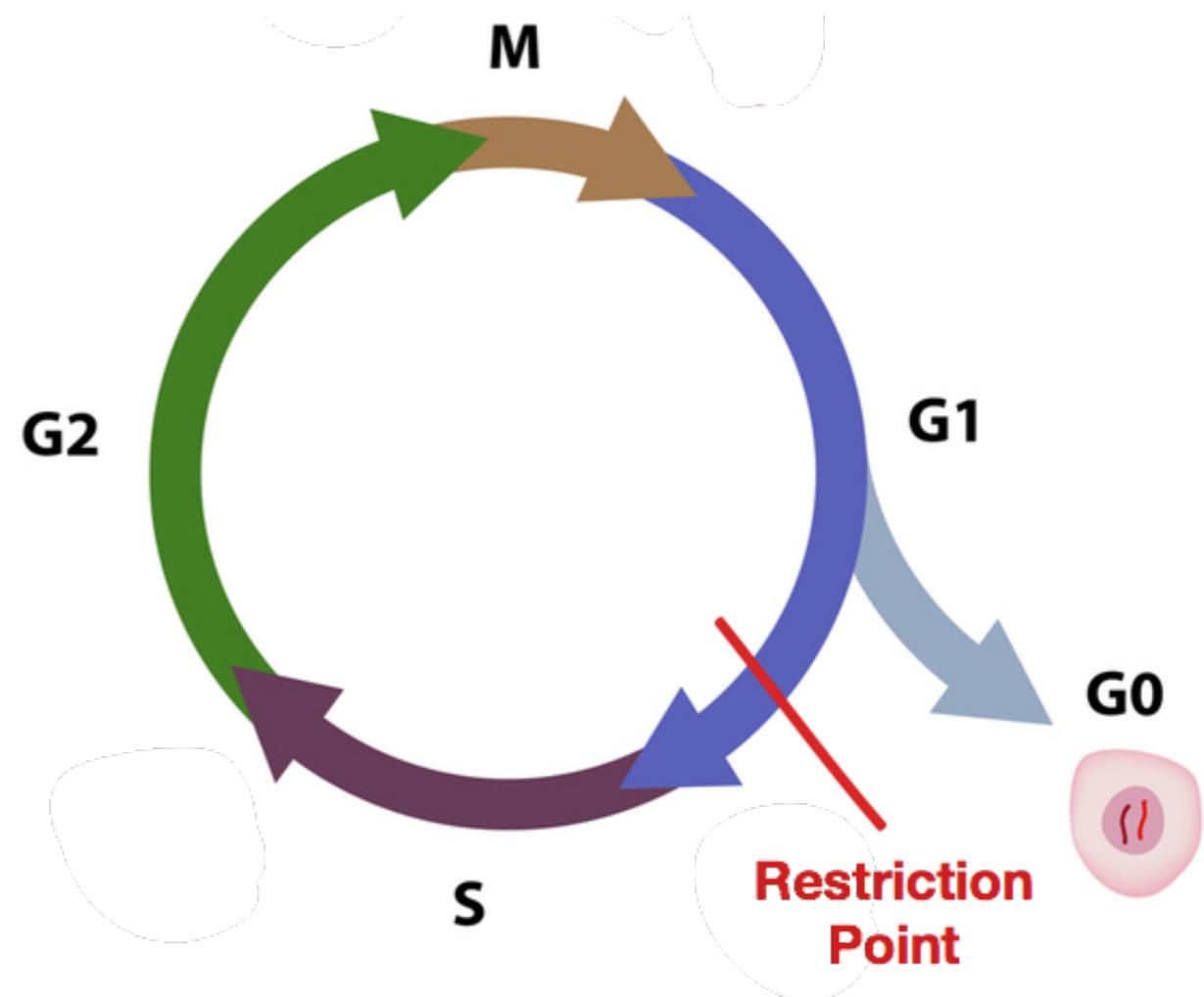
Specialized Cells



- A cell will become specialized during the G1 phase of the life cycle.
- Once a cell has become specialized, it will enter G0 and the specialized cell will NOT divide.

G0

- In order for a cell to pass the restriction point, it will need the right signal molecules.
- If the signal molecules are NOT present, the cell will enter G0.
- G0 is a nondividing state of the cell cycle.

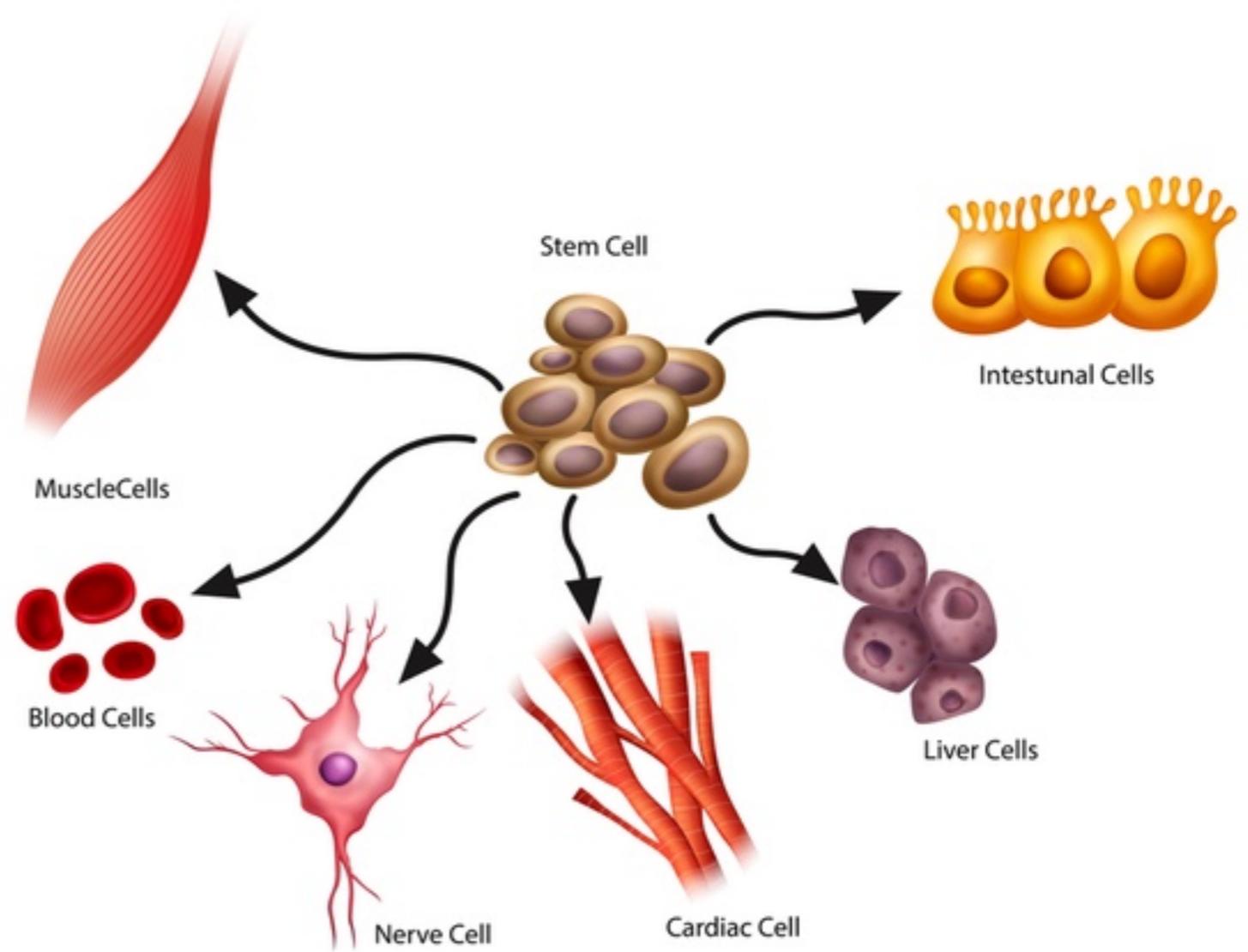


Question

- If most cells don't divide, which cell do?

Stem Cells

- Stem cells and their intermediate cells are the cells that divide.
- Once the intermediate cells have become completely differentiated, that cell will enter G0.



Question

- Draw the cycle circle with the name of the 5 cell cycle phases.
- Draw in the the 3 checkpoints and properly label each checkpoint.