

Exercise walk-through

4.1

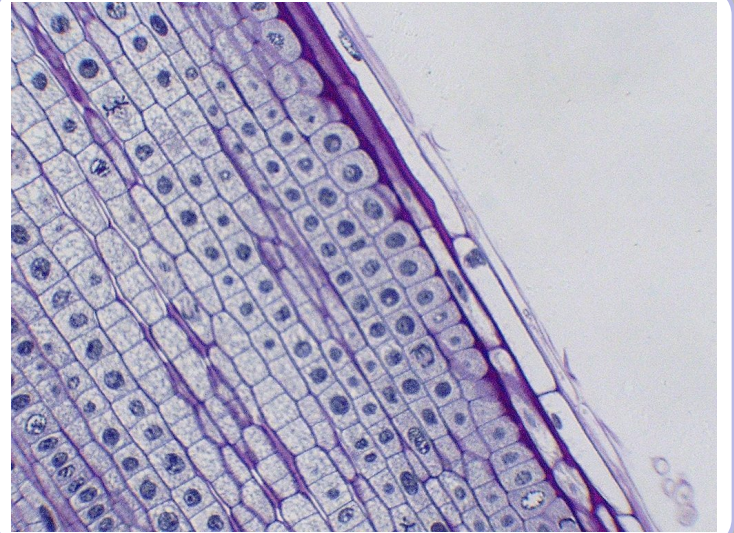
Cell Communication

AP Biology

The cell cycle

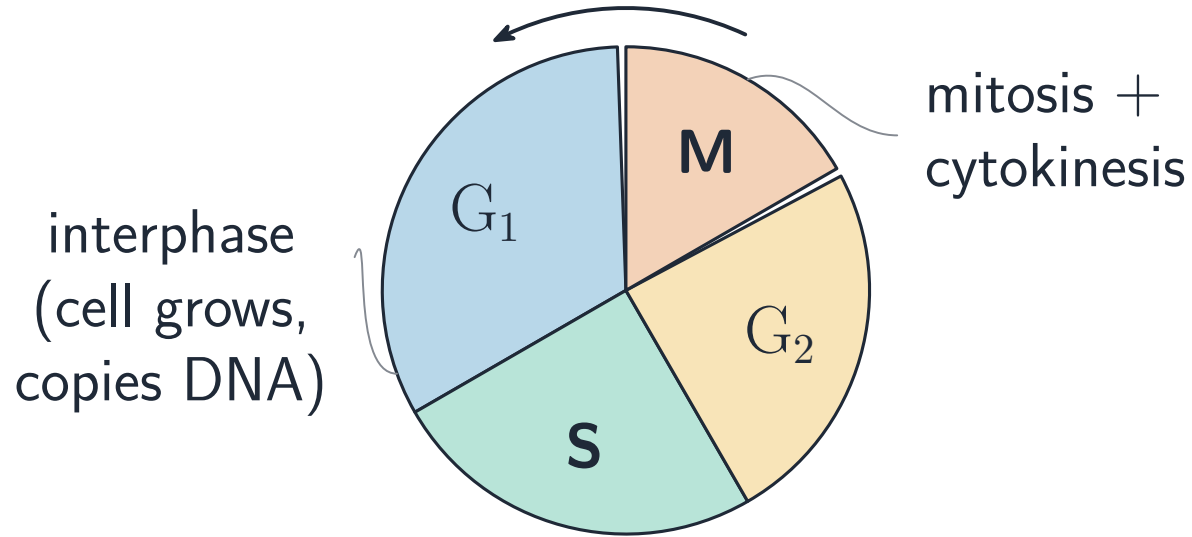
- **interphase** – grow and copy DNA
- **mitosis** (M) – split the nucleus: **P**rophase, **M**etaphase, **A**naphase, **T**elophase
- **cytokinesis** – split the cytoplasm

Two identical **diploid** **daughter cells** ; n divisions $\Rightarrow 2^n$ cells.



Mitosis produces two identical daughter nuclei

The cell cycle: interphase



The cell cycle: interphase, then mitosis and cytokinesis

Exercises 2.1-2.3

2.1 What binds a chemical signal on the target cell?

[1]

2.2 Name the three types of signaling by distance.

[3]

2.3 Why does a hormone affect only some cells?

[1]

Exercises 2.1-2.3

2.1 What binds a chemical signal on the target cell? [1]

2.1

- A receptor (protein)
-

2.2 Name the three types of signaling by distance. [3]

2.2

- Direct contact, local signaling, long-distance signaling
-

2.3 Why does a hormone affect only some cells? [1]

2.3

- Only cells with the matching receptor can bind the hormone and respond

Exercise 3.1

3.1 Only cells that respond to a particular signal have the correct

[1]

☐

A enzyme

B receptor

C ribosome

D membrane

Exercise 3.1

3.1 Only cells that respond to a particular signal have the correct

[1]

☐

A enzyme

B receptor

C ribosome

D membrane

3.1 B

- receptor

Exercise 3.2 (a)

3.2 Insulin travels in the blood to reach liver and muscle cells.

(a) Name this type of signaling.

[1]

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[1]

(a)

- Long-distance (hormonal) signaling

Exercise 3.2 (b)

3.2 Insulin travels in the blood to reach liver and muscle cells.

(b) Explain why insulin affects these cells but not others.

[2]

Exercise 3.2 (b)

3.2 Insulin travels in the blood to reach liver and muscle cells.

(b) Explain why insulin affects these cells but not others. [2]

(b)

- Only liver and muscle cells have the insulin receptor, so only they can bind it and respond

Exercise 3.3

3.3 Explain the difference between local and long-distance signaling.

[2]

Exercise 3.3

3.3 Explain the difference between local and long-distance signaling. [2]

3.3

- Local signaling reaches nearby cells by diffusion over short distances; long-distance signaling uses hormones carried in the blood to reach distant target cells