Chapter 28: Animal Systems II

Class	Biology

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28.4 — Homeostasis

Interrelationship of Body Systems

Homeostasis: the control of internal conditions

- Failure of homeostasis for a few moments → Devastating

> **ALL** body systems interact to maintain *homeostasis*.

- Many organ systems are rendered useless without working with others

Fighting Disease

Pathogens: disease-causing microorganisms

- Internal environment for animals is hospitable to pathogens
    - Easy to steal helpful nutrients

Immune System → differentiates between the body and pathogens

Chemical Controls

Body functions are *mostly* regulated using chemical controls.

- **Endocrine Glands** → release hormones into the blood to give chemical instructions to the body

Body Temperature Control

All organisms respond to external temperature.

- Most organs can only operate within specific temperatures
    - Can't work if solely dependent on external temperature
    - Temperature must be regulated in an organism's internal environment

Body Temperature Control: source of heat, way to conserve heat, method to eliminate excess heat

- Interactions betwen multiple body systems

Ectotherms

Ectotherms → animals regulate body temperature depending on relationships to external sources of temperature

- *Most* reptiles, invertebrates, fishes, amphibians
- Mostly low metabolic rates while resting

Endotherms

Endotherms → animals regulate body temperature using heat generated by the body

- High metabolic rates (generate heat even when resting)
- Insulation using body fat, hair (some animals), feathers (birds)

Comparing Ectotherms and Endotherms

Endotherms:

- Move around easily in colder temperatures
- Requires a lot of fuel for metabolism

Ectotherms:

- Need much less food than similarly-sized endotherms
- Trouble in colder temperatures

Evolution of Temperature Control

There is a lot of evidence to suggest that *some* dinosaurs were endotherms.

- Feathered dinosaurs could've used feathers as *insulation*

Current evidence → endothermy has evolved **at least twice** among vertebrates

- Once along ancient reptiles → *birds*
- Once along ancient reptiles → *mammals*