

# Unit 3

## Maintaining Dynamic Equilibrium p.298-303

Maintaining Dynamic Equilibrium = Homeostasis

**Homeostasis** – The body's maintenance of a relatively stable internal physiological environment.

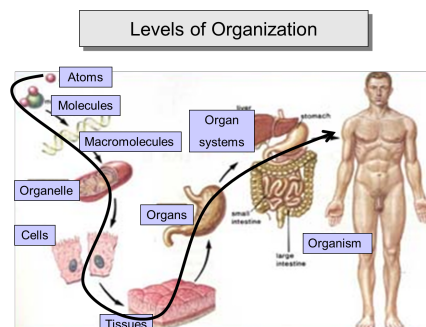
Homeostasis Video



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## Maintaining Dynamic Equilibrium

- Humans are composed of cells.
- These **cells** are organized into **tissues**, the tissues into **organs** and organs into **systems**.
- For homeostasis to be maintained, many complex systems must work together all the time.
- This unit will deal only with human systems.



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What are some human organ systems?

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## **Maintaining a Constant Temperature p. 298-303**

- One important aspect of homeostasis for humans is maintaining a constant internal temperature of  $37^{\circ}\text{C}$ .
- If the internal temperature changes, many of the chemical reactions needed to survive may not occur.
- Therefore, temperature is constantly monitored and regulated through a **negative feedback loop**.

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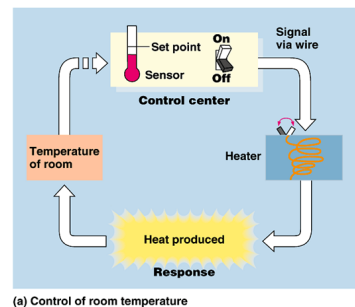
### Maintaining a Constant Temperature

- **Negative feedback loop** – A homeostatic mechanism that detects and reverses changes from the normal levels.
- When the body's environment changes, it does something that has the opposite affect. This brings things back to normal again.

Example: A thermostat

If a room gets too *cold* the thermostat turns *on* the heater and the room gets *warmer*.

If a room gets too *hot* the thermostat turns *off* the heater and the room gets *colder*.



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### Maintaining a Constant Temperature

#### Homeotherm (aka warm-blooded)

Organism that maintains a stable internal body temperature regardless of external influence.

#### Poikilotherm (aka cold-blooded)

Organism whose internal temperature varies considerably.

Naked mole rat - the only poikilotherm mammal



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## Maintaining a Constant Temperature

Most mammals are homeotherms.

Ways mammals maintain a constant internal temperature include:

1. Fur
2. Modifying metabolic reactions to produce +/- heat.
3. Evaporative cooling (sweating)
4. Circulating a warm fluid (blood) around the body.
5. Modifications to the circulatory system.



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