**AP Biology: Homeostasis**

Concept 4: Analyzing how hormones in the animal endocrine system use feedback to control homeostasis (Ch 40, 45)

*You must know:*

* The importance of homeostasis and examples
* How feedback systems control homeostasis
* One example of positive feedback and one example of negative feedback.

Exchange with the Environment



Animals need to exchange materials with their \_\_\_\_\_\_\_\_\_\_\_\_\_\_& this poses limitations to\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The *rate* of exchange is **proportional** to membrane surface area.

The *amount* of material that must be exchanged to sustain life is also proportional to **volume**.

hierarchical organization of body plans

Cells:  form an animal’s body through their emergent properties.

Tissues:  groups of cells of similar appearance and a common function.

Organs:  Different tissues are organized into functional units called organs.

Organ Systems:  groups of organs that work together.

TISSUE TYPES

* Epithelial Tissue - Occur in sheets of cells, covers the \_\_\_\_\_\_\_\_\_\_\_\_of the body and lines organs and cavities \_\_\_\_\_\_\_\_\_\_\_\_\_the body.
* Connective Tissue - The most common function is to \_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_other tissues in the body
* Muscle Tissue - Responsible for nearly all types of body\_\_\_\_\_\_\_\_\_.  All contain \_\_\_\_\_\_\_and\_\_\_\_\_\_\_\_.
* Nervous Tissue - The function is to \_\_\_\_\_\_\_\_\_\_\_\_stimuli and transmit signals in the form of\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



CONTROL & COORDINATION Two major systems *control* and *coordinate* animal tissues, organs, and organ systems:

**Endocrine System** - (using \_\_\_\_\_\_\_\_\_\_\_that travel via blood)

**Nervous Systems**  (using impulsesalong nerves and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_between nerves)

HOMEOSTASIS

In **homeostasis**, animals maintain a relatively\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, even when the external environment changes significantly.

* + Temperature
	+ pH
	+ Salinity

FEEDBACK SYSTEMS CONTROL

**Negative (opposite) Feedback Systems**

* + Animal response reduces stimulus

Example:

**Positive (same) Feedback Systems**

* + Animal response amplifies the change (instead of reversing it)

Example:

Energy requirements are related to animal size, activity and environment



**Basal Metabolic Rate (BMR)** - minimum metabolic rate of a non growing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_that is at rest, has an empty stomach and is not experiencing stress.

**Standard Metabolic Rate (SMR)** - the metabolic rate of a fasting, non-stressed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_at rest at a particular temperature

Torpor and Energy Conservation

Torpor → a physiological state in which activity is low and metabolism decreases is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to conserve energy during environmental extremes.

Example: