Endocrine System, Chap 19 Lecture Outline

Human bodies are complex and are organized at many different levels

Simultaneous coordination of entire body systems

Nervous system

Endocrine system

Nervous system

Sensory input

Responds rapidly

Effects quickly disappear

Endocrine system

Monitor and coordinate on sustained long-term basis

Sensory input

Responds slowly

Long-lasting effects

Both systems share similarities

Nervous system

–Rapid

–Short-lived effects

–Crisis management

Endocrine system

–Slower

–Long-lived effects

–Coordination of

Complex development

Gradual adjustments

Cell-to-cell communication

Direct- Cell-to-cell contact through gap junctions

Local- Paracine (acts within same tissue)

Distant- Endocrine (acts on different tissue)

Hormones are like bulk mail

Released into bloodstream

All cells are flooded with them

Only cells with receptors can receive message

Cells can have multiple receptors

Hormones

Produced locally, act globally (distant)

Three main types

–Amino acid derivatives

–Peptides

–Lipid derivatives

Hormone distribution and transport

Released into bloodstream

–Float free in blood

–Bound to special carrier protein

Hormone receptors are located in cell membrane and within cell

Water-soluble bind to outside of cell

Lipid hormones diffuse into cell and bind to receptors

Binding of hormones leads to a cascade of effects

Control of endocrine activity

Stimuli

–Humoral-changes in extracellular fluid

–Hormonal-arrival or removal of specific hormone

–Neural-arrival of nerve impulse

Results in hormone synthesis and release

Hypothalmus exerts control over endocrine organs

Pituitary gland responds to the hypothalamus

Pituitary hormones control many processes

Endocrine organs throughout the body control and maintain processes

Insulin and glucagon regulate blood glucose levels