Hormones Basics

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Hormones are chemical messengers that travel through blood to reach and affect target cells.
Classification of hormones
Based on Structure
Based on Solubility
Based on distribution to sites of action
HORMONE SECRETION
Neural
Endocrinological
Biological
Environment and Photoperiod

PULSATILE AND SURGE LIKE RELEASE
Rate of production
Positive and Negative Feedback
HORMONE SYNTHESIS

Proteins and peptides from amino acids according to mRNA transcripts

Steroids from cholesterol

Prostaglandins from arachidonic acid (Fatty acids)
Hormone transport

Endocrine hormones → Blood → Cell

Steroids, thyroid hormones, androgens and estrogens → Bound to SHGB

Progesterone, cortisol and Corticosteroids → Bound to transcortin

Corticoids → Bound to CBG
Mechanism of action of hormones
The hormones bind to their receptors on or within the cell.

Hormone receptors might be located:
1. In or on the surface of cell membrane, e.g. protein or peptide hormones and catecholamines.
2. In the cytoplasm, e.g. steroid hormones.
3. In the cell nucleus, e.g. thyroxine.
(a) Steroid hormone action

1. Steroid hormone binds to cytoplasm.
2. Receptor protein binds to steroid hormone-receptor complex.
3. Hormone-receptor complex enters the nucleus.
4. DNA is transcribed into mRNA.
5. New protein is synthesized.

(b) Nonsteroid hormone action

1. Nonsteroid hormone (first messenger) binds to cell membrane.
2. Receptor protein binds to nonsteroid hormone-receptor complex.
3. Enzyme is activated, producing cAMP.
4. cAMP affects cellular function, such as glycogen breakdown.
5. Plasma membrane of target cell.
HORMONE METABOLISM

PEPTIDES AND PROTEINS → LIVER AND KIDNEYS → BROKEN TO AMINO ACIDS

GnRH → BROKEN DOWN BY PEPTIDASES

STEROIDS → LIVER → HYDROXYLATED AND CONJUGATED WITH GLUCURONIC OR SULFURIC ACID → REDUCED BINDING TO CARRIER PROTEINS AND INCREASED URINARY AND Fecal EXCRETION

PROSTAGLANDINS → INACTIVATED AT SITE → CIRCULATION → METABOLIZED AND REMOVED BY LUNGS AND LIVER
• The above lectures are also explained in video lectures at my YouTube Channel Govind Narayan Purohit

• Kindly share the videos and subscribe to my channel if you like them

• THANKS