Endo 2: Endocrine control

For each hormone, know ...

- name and location of secreting organ
- chemical class and receptor type (where given)
- target(s) and main effect on target(s)
- control pathway

- Contrast the anterior and posterior pituitary in hormones and mechanisms of release (innervation and vascular supply).
- Diagram the control axes/ negative feedback control of anterior pituitary hormones.

Parathyroid Hormone (PTH) stimulates…
- bone osteoclasts to breakdown Ca-phosphate
- kidneys to reabsorb Ca$^{2+}$
- intestines to increase Ca$^{2+}$ absorption (through vitamin D activation)

Calcitonin
- osteoblasts to build bone
- kidneys to excrete Ca$^{2+}$

PTH & calcitonin are peptide hormones.
- What is their basic chemical structure?
- How are they made? stored? released?
- Where are their receptors on target cells?
Calcitonin has effects opposite of PTH effects on bones, kidneys.

\[
\downarrow [Ca^{2+}]_{\text{plasma}} \quad \text{causes} \\
\text{PTH} \downarrow \text{or} \uparrow ?
\]

\[
\uparrow \text{PTH causes} \\
[Ca^{2+}]_{\text{plasma}} \uparrow \text{or} \downarrow
\]

Represent these on a simple graph.

Endocrine homeostatic control of osmolarity:
regulation of water volume and [ion]s

- Aldosterone - promotes sodium conservation
- Vasopressin (anti-diuretic hormone) - promotes water conservation
- ANP (atrial natriuretic peptide) - promotes sodium loss, to reduce water vol.
Osmoregulation: Aldosterone

• Induces Na⁺ conservation
• Synthesized and released from adrenal cortex
• Steroid hormone
• Acts on kidney cells to increase production of Na⁺ membrane channels and Na⁺/K⁺ pumps

* warning - gross anatomy picture is next
Osmoregulation: Vasopressin (ADH)

- Induces H₂O conservation
- Released from posterior pituitary
- Peptide hormone (stored in vesicles, moves out of cells by exocytosis)
- Activates G protein, cAMP 2nd messenger system in kidney cells to increase water pores (aquaporins) on apical membrane surface.

Aldosterone & ADH effects on OsM

- If aldosterone rises OsM
  * increases or decreases?

- If ADH rises OsM
  * increases or decreases?