Objectives

- To conclude the survey of the glands and their associated hormones.
- To address the different chemical types of hormones.
- To differentiate types of hormone actions.
  - steroid entry and influence
  - secondary messenger

Thymus

<table>
<thead>
<tr>
<th>Thymosin</th>
<th>Stimulates maturation of cells of the immune system. T cell maturation</th>
</tr>
</thead>
</table>

Largest in infants — diminishes with age.

Pineal Gland

<table>
<thead>
<tr>
<th>Melatonin derived from serotonin</th>
<th>Regulates seasonal reproductive cycles. In non-human animals.</th>
</tr>
</thead>
</table>

Fun Facts:
- “Glowes in X-rays”
- Possible birth control (under investigation in Germany)

Ovaries

<table>
<thead>
<tr>
<th>Estrogen</th>
<th>Causes female secondary sexual characteristics. Maturation of eggs Promotes growth of uterine lining.</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Progesterone</th>
<th>Stimulates development of uterine lining and formation of placenta.</th>
</tr>
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</table>

Testes

<table>
<thead>
<tr>
<th>Testosterone</th>
<th>Stimulates development of male genitalia. Stimulates male secondary sexual characteristics. Stimulates spermatogenesis.</th>
</tr>
</thead>
</table>
Hormone Chemical Types

Effects:
Autocrines vs. Paracrines

Composition:
- Amino acid based e.g. thyroxin
- Steroids e.g. testosterone
- Eicosanoids e.g. prostaglandins

Steroid Action

- Lipid soluble - move through PM easily.
- Inside cell bind to receptors.
- Carried to DNA to activate genes to transcribe mRNA
  ➔ thus to influence protein synthesis.
  ..........can activate or deactivate enzymes
  ..........can promote mitosis ➔ growth.

Secondary Messengers

Involves:
A hormone receptor
A switch operator
Effector enzyme e.g. adenylate cyclase
Secondary messengers
cAMP
PIP (liberated Ca++ ions).

End result ➔ energizes cell activities/molecules.
  e.g. production of insulin.