Salivary Glands

Three main glands (think head & neck anatomy!):
1) Parotid (*serous* gland)
2) Submandibular (*mucous* + *serous* gland)
3) Sublingual (*mucous* + *serous* gland)
Secrete in response to **parasympathetic** activity.

**Serous vs. Mucous Glands**

<table>
<thead>
<tr>
<th><strong>Serous</strong></th>
<th><strong>Mucous</strong></th>
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<tbody>
<tr>
<td>Round, central nuclei</td>
<td>Nuclei flattened against basement memb</td>
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<tr>
<td>Dispersed chromatin</td>
<td>Condensed chromatin</td>
</tr>
<tr>
<td>Stain <strong>dark</strong> w/ H&amp;E (zymogens)</td>
<td>Stain <strong>light</strong> w/ H&amp;E (mucin)</td>
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<tr>
<td>Large striated ducts</td>
<td>Smaller striated ducts</td>
</tr>
<tr>
<td>Thin, watery secretion</td>
<td>Thick, viscous secretion</td>
</tr>
<tr>
<td><em>Zymogens</em> + antibodies + inorganic ions</td>
<td>Mucin</td>
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</tbody>
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**General Gland Architecture:**
- glands divided into lobules, each w/ multiple secretory units
- outer capsule surrounds gland, extends tissue septa between lobules
- septa convey blood vessels, nerves, and large excretory ducts

**Salivary Gland Secretory Unit:**

*Acinus*  **→ Intercalated Duct**  **→ Striated Duct (Intralobular)**  **→ Excretory Duct (Interlobular)**

**Acinus:** terminal secretory unit

**Intercalated Duct:** secretes bicarbonate, absorbs Cl-
Striated Duct: cuboidal cells w/ large nuclei
striations @ cell base = 1) infoldings of plasma memb +
   2) columns of mitochondria striations
larger in serous vs. mucous glands, b/c striated duct modifies
   - saliva is hypotonic to plasma, but the initial secretions
     from serous acini are isotonic; striated ducts in serous
     glands change the ion content \(\rightarrow\) hypotonic

Excretory Duct: stratified cuboidal epithelium; can run within septa

Serous Demilunes: in mixed glands, product of fixation; w/ H&E, dark staining “half-moons” outside of pale-staining mucous cells

Myoepithelial Cells: processes infiltrate acini; when contract, force secretions from
   acini \(\rightarrow\) ducts.
flattened nuclei situated between plasma memb & basement memb
Exocrine Pancreas

The exocrine pancreas is a purely serous gland!
(Think: High enzymatic activity = serous)

Gland Architecture:
- Highly lobulated
- Thin, loose collagenous capsule extends septa b/t lobules

Acini: closely packed, terminal secretory units; pyramid shaped cells
    cells secrete zymogens
    Apex (@ duct lumen) → eosinophilic (zymogens)
    Basal → basophilic (high rER content)
    Nuclei round and basal

Intercalated Duct: secretes HCO$_3$- and water in response to secretin

Acinus → Intercalated Duct → Intralobular Duct (not striated) → Interlobular Duct →
Pancreatic Duct → Ampulla of Vater → Duodenum

Features of Pancreas that distinguish it from Parotid:
1) Islets of Langerhans. Clusters of pale-staining cells surrounded by exocrine acini.
    Most dense @ tail. Endocrine function, produce insulin and glucagon – will learn at end of semester.

2) Centroacinar Cells. Beginning of intercalated duct. Low, cuboidal, paler vs. true acinar cells although found @ acinus.

3) NO Striated Ducts. Can see large, prominent interlobular (excretory) ducts, but if see striated, think PAROTID, not pancreas.

Enzyme Function:
Cholecystokinin (CCK) → triggers enzyme production @ pancreatic acini → enzymes produced & secreted:
    - trypsinogen
    - pepsinogen
    - amylase
    - lipase
    - deoxyribonuclease, etc.
Enzymes secreted as proenzymes, then activated in duodenum by Enterokinase
    → this control prevents pancreatic autodigestion