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Salivary Gland

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1. States the major components present in salivary secretions.
    a. H_2O - moisten mouth and wash away dissolved food (necessary for taste)
    b. Ions (HCO_3^- neutralizes acids in food and regurgitated stomach acid, K^+)
    c. Amylase - partial digestion of polysaccharides
    d. Antibacterial compounds
        i. Lysozyme
        ii. Lactoferrin
        iii. IGA
    e. Mucus - lubrication of food
    f. Ca^{2+}, fluoride maintain teeth
2. States the substances and digestion products of salivary amylase.
    a. Cleaves alpha1,4 bonds in starch
    b. Can break down up to 50% of starch before being inactivated by stomach acid
    c. Normally makes up about 10% of amylase
3. Describes the contribution of salivary amylase to the digestion of carbohydrates in the stomach: begins breakdown of starch
4. Describes the function of salivary mucus: lubricates food.
5. States the types of stimuli that increase salivary secretion
    a. Taste
    b. Smell
    c. Chewing
    d. Inhibited by sleep, fatigue, fear
6. States the effects of parasympathetic and sympathetic stimulation on salivary secretion.
    a. Oral mechano and chemo receptors (chewing and acids)
    b. Intestinal and central chemoreceptors (vomiting)
    c. Send signal to CNS
    d. Parasympathetic begins in salivatory nuceli and carried along V, VII, IX cranial nerves
    e. Ach is major transmitter, anticholinergics result in dry mouth
    f. Sympathetic innervation acts on glandular beta-adrenergic receptors to decrease salivation
    g. Aldosterone modifies ionic composition by decreasing Na^+ (increases K^+)
7. States the components of the saliva important in oral hygiene.
    a. Antibacterial compounds keep bacteria free and prevent bad breath
    b. Ca^{2+}, fluoride strengthen teeth
8. Describe the major ionic components of saliva and the role of acinar and duct cells in the production of saliva.
    a. High resting blood flow
        i. Increased by parasympathetic innervation
        ii. Release of local mediator Kallikrein --> bradykinin (vasodilator)
    b. Glands are acinar-ductular in structure
        i. Parotid - serous - 25%
        ii. Sub-mandibular - mixed - 70%
        iii. Sub-lingual - mucous - 5%
        iv. Basal rate: 0.25 ml/min; up to 5-10 ml/min
        v. Hypotonic, alkalinic
    c. Acinar cells
        i. Serous - secrete watery fluid containing proteins (amylase)
            1) Plamsa like in composition of major ions
        ii. Mucous

d. Ductal cells
    i. Na+, Cl- reabsorbed
    ii. Na+/K+ ATPase
    iii. Cl-/HCO3- exchanger
    iv. As saliva travels it becomes hypotonic
e. Myoepithelial cells - contractile - cause saliva to spray out of ducts
f. Xerostomia - dry mouth
    i. Caused by drugs, head and neck radiation, Sjogrens syndrome
    ii. Absence of saliva leads to infections, tooth decay, severe discomfort