🏆 Let's Take Attendance 🏆

http://sciovirtual.org/attendance

Attendance code: lastanat

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Scio A+P Review 2022

Our time together is coming to an end...

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Course Challenge 3 Winners

- Nimisha K.
- Aarav R.
- Amritpreet S.
- Michelle K.
- Ritisha U. and Manasvi G.
- Emma C., Nesara S. and Kevin L.
- Joshua T., Caitlyn K., Yongjing L. and Trisha K.

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Lesson 1

The Basics

- Digestion is needed to break down particles ingested into small parts so new things can be made with those smaller parts according to needs of organism as well as to get energy
- Essential nutrients include amino acids, fatty acids, vitamins, minerals and carbohydrates

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Digestive Process

- Starts in mouth with teeth, saliva and bolus formation
- Passes through pharynx and then through esophagus through peristalsis
- Stomach is waiting room for bolus where some protein digestion occurs
  - Gastric acid kills food
  - Mechanical and Chemical digestion occurs here
- Stomach transfers to small intestine where complete digestion and absorption occurs
  - Ileum is longest part of small intestine
- Water, electrolytes and some fatty acids are reabsorbed in large intestine
  - Also a host to a very diverse microbiota correlated and contributing to many areas of health

Lesson 2

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Recap

- Layers of GI tract innermost: mucosa -> submucosa -> muscularis -> serosa
- Parasympathetic increases digestive function while sympathetic decreases
- Enteric Nervous System can self-regulate digestive function
- 3 phases of swallowing:
  - Oral
  - Pharyngeal
  - Esophageal

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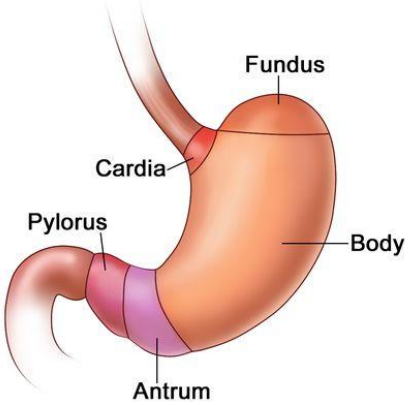
Types of Cells

- Mucus/goblet cells - secrete mucus
- Parietal cells - secrete hydrochloric acid
- Chief/zymogenic cells - secrete pepsinogen
- G cells - secrete gastrin
- D cells - secrete somatostatin



Lesson 3

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Main Points

- Stomach only partially digests proteins; small intestine completes digestion of everything and absorbs nutrients
- Villi and microvilli to increase surface area for absorption
- Brush border enzymes stay on intestinal wall while pancreatic enzymes come from pancreas
- Intestinal peristalsis and segmentation
- Hepatic portal vein and lymphatic system for fat absorption
- Enterohepatic circulation
- Bile pigment and bile salts

Lesson 4

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Diseases and Conditions

- Phases of stomach function: Cephalic, Gastric and Intestinal
- Cholecystokinin and Secretin
- Regulation of bile secretion
- Peptic ulcers - H. Pylori
- Diabetes
- Diarrhea
- Lactose Intolerance
- Hepatitis
- Appendicitis
- Heartburn
- Celiac Disease

Lesson 5

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Hormones

- Other stomach hormones:
  - Gastrin - released when empty and increases appetite
  - Motilin - released between meals; stimulates stomach contractions and accelerates digestion by contracting gallbladder and increasing pressure of lower esophageal sphincter
  - Serotonin - Inhibits gastric acid
- Small intestine hormones:
  - Gastric inhibitory peptide - Secreted by K cells to increase insulin production due to high blood sugar and inhibits absorption of water in small intestine(increased in diabetes)
  - Peptide YY - suppresses appetite after meal
- Insulin and glucagon released by pancreas regulates blood sugar

Lesson 6

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Recap

- Tracheal system for insects and gills for fish
- Positive(pushing air into lungs) and negative pressure breathing(pulling air into lungs)
- Unidirectional(humans) and bidirectional breathing(birds)
- Respiratory and conducting zone
- Type 1 and Type 2 alveolar cells
  - Surfactant
- Respiratory distress syndrome and cystic fibrosis
- Compliance, elasticity and surface tension

Lesson 7

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Laws and Effects

- Dalton's Law - Total pressure of mixture of gases is sum of individual pressures
- Henry's Law - Amount of gas dissolved is proportional to partial pressure
- 4 subunits in hemoglobin and bind oxygen
- Cooperative binding of hemoglobin
  - Binding on subunit makes binding onto another subunit more easy
- Carbon monoxide toxicity
  - Binds to hemoglobin better than oxygen
- Bohr Effect
  - Co2 effect

Lesson 8

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Diseases and Disorders

- Restrictive disorders reduce lung volume while obstructive reduce airflow to and from lungs
- Sickle cell Disease
- Pulmonary fibrosis
- Asthma
- COPD
- Pneumonia
- Anemia
- Hypoxia
- Laryngitis

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More Resources and Opportunities

- Fox and Campbell's
- Scioly and USABO
  - Other olys as well

Final Words