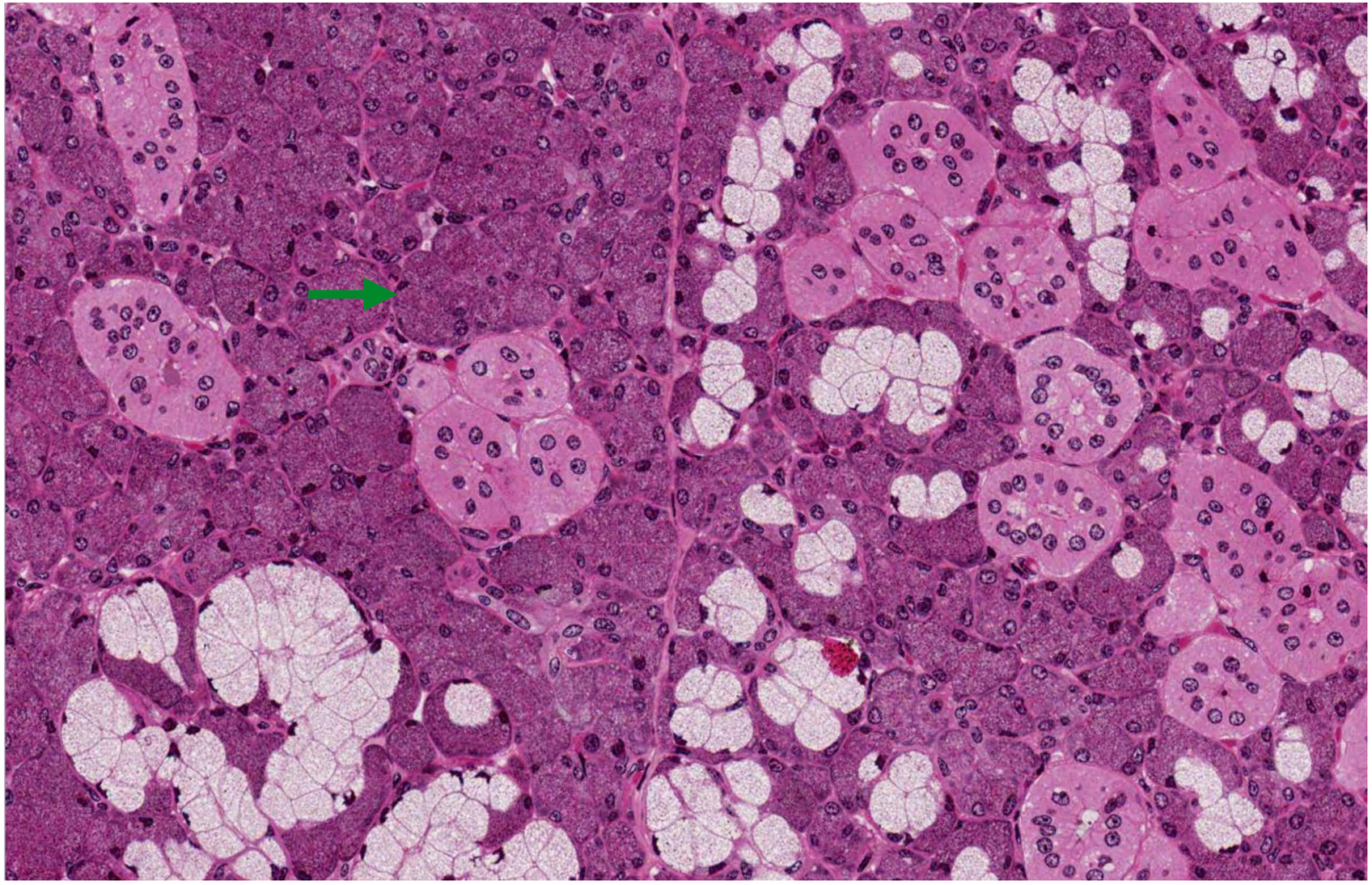
Digestive Organs

Readiness Assessment Questions

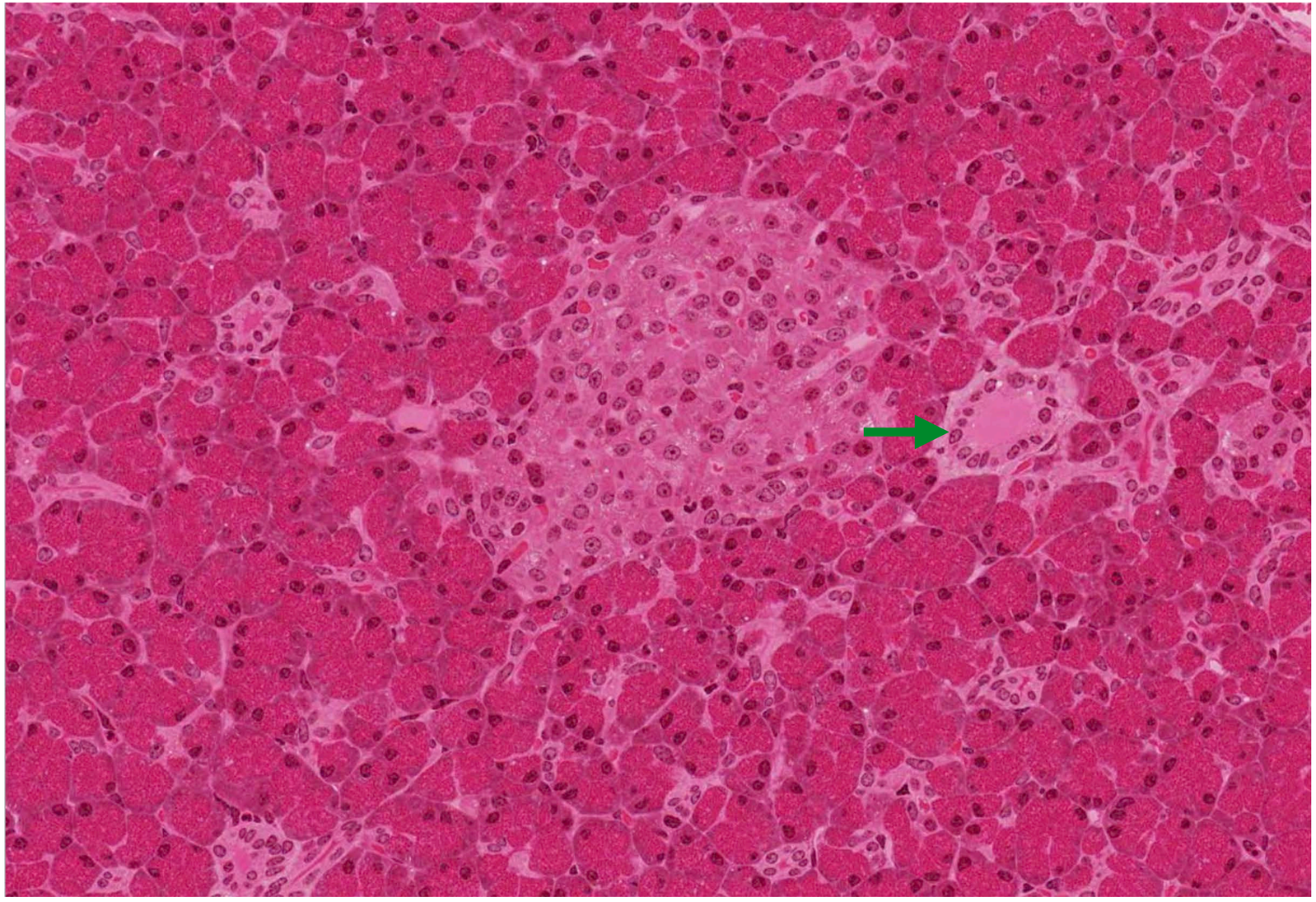
1. These cells (arrow) primarily produce which of the following?

- Chymotrypsin
- Trypsin
- Pepsinogen
- Amylase



2. These cells (arrow) secrete which of the following?

- Bicarbonate
- Sodium
- Potassium
- Mucus



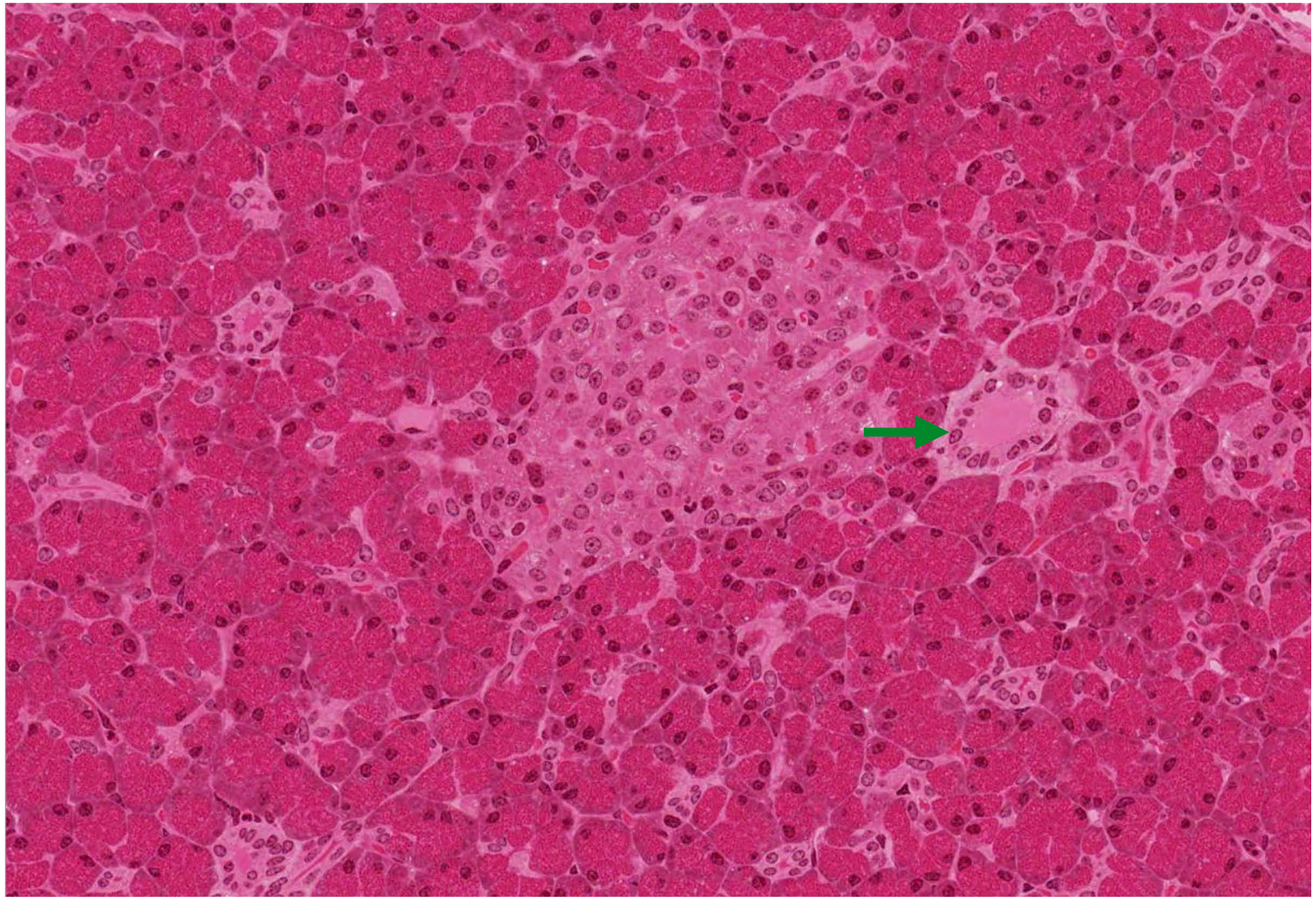
3. What hormone stimulates these cells?

A. Cholecystokinin

B. Secretin

C. Gastrin

D. Histamine



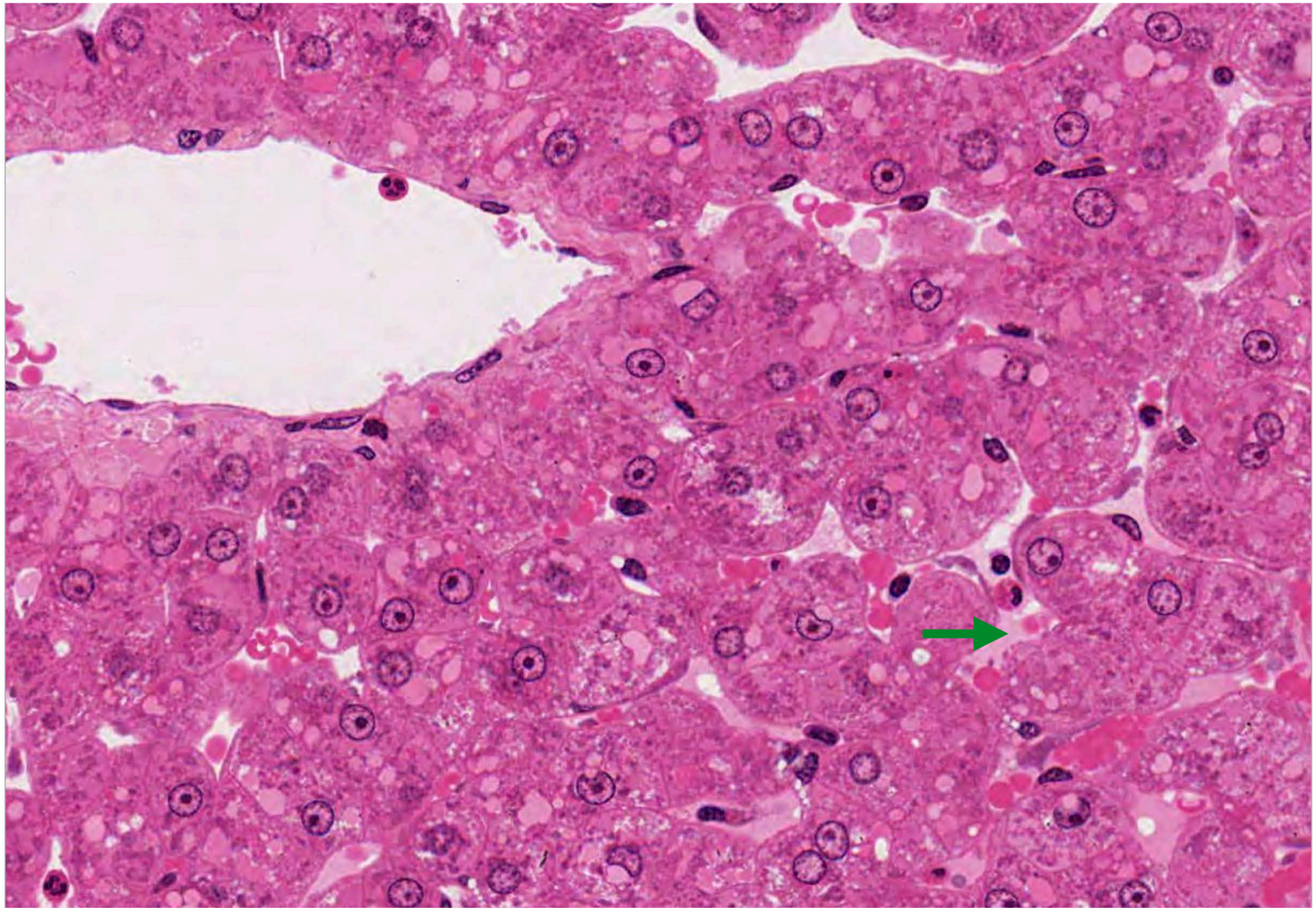
4. This structure (arrow) in the liver is defined by which of the following?

   A. Continuous endothelium

   B. Fenestrated endothelium

   C. Discontinuous endothelium

   D. Simple cuboidal epithelium



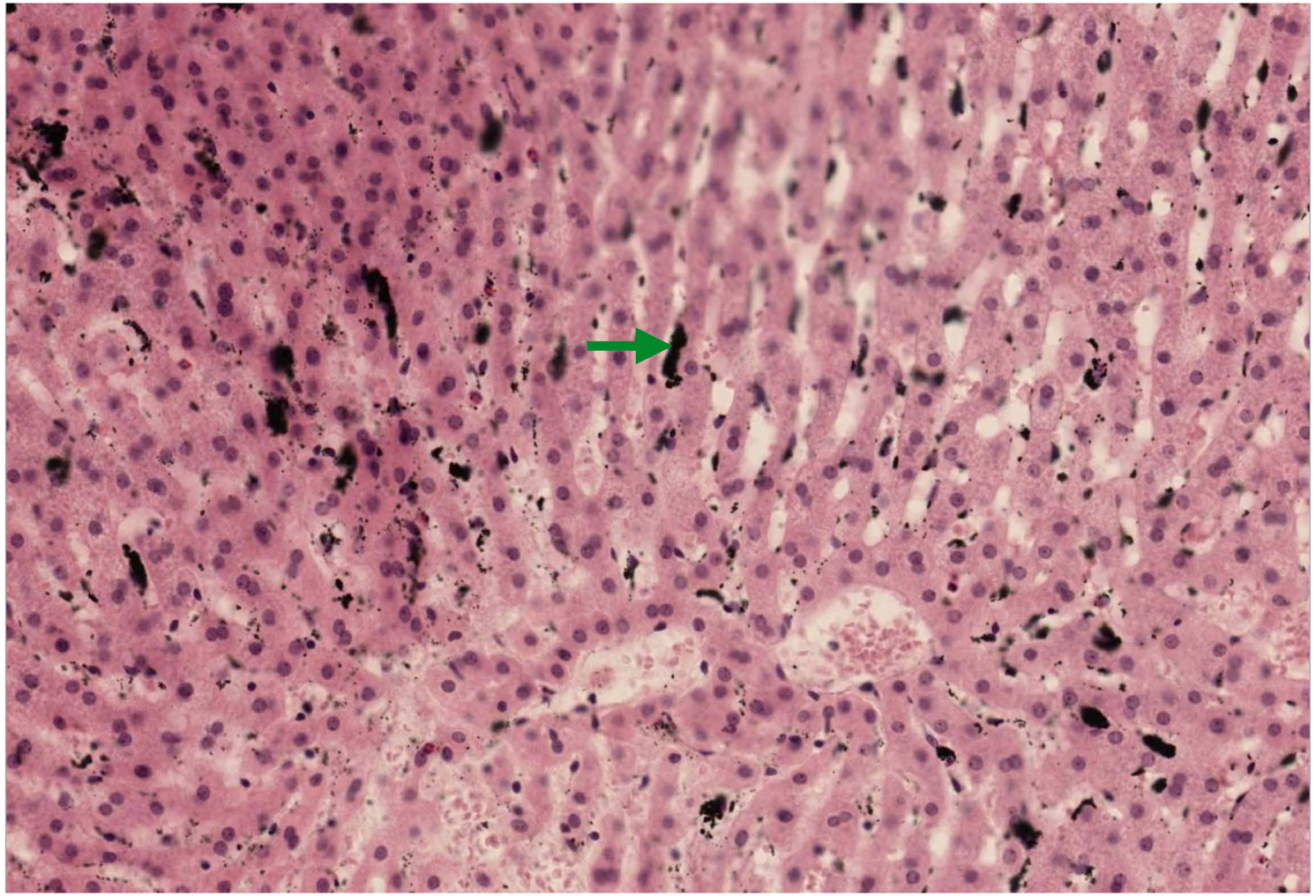
5. Carbon black nanoparticles are found in a variety of consumer products, including laser printers and makeup. Identify this cell from an animal that was exposed to high concentration of carbon black nanoparticles.

A. Dust cell

B. Kupffer cell

C. Hepatocyte

D. Monocyte



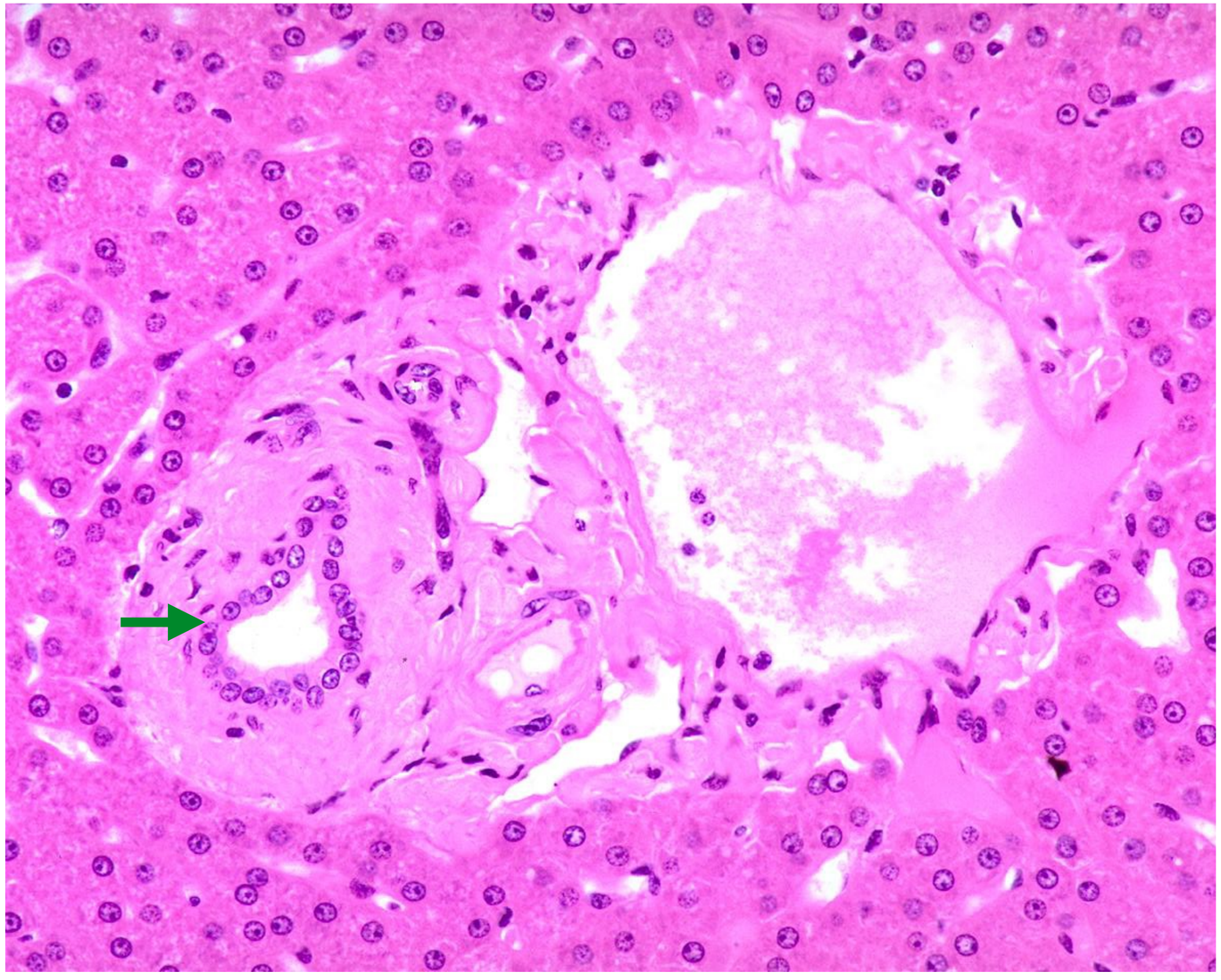
6. This structure conveys which of the following?

A. Lymph

B. Fully oxygenated blood

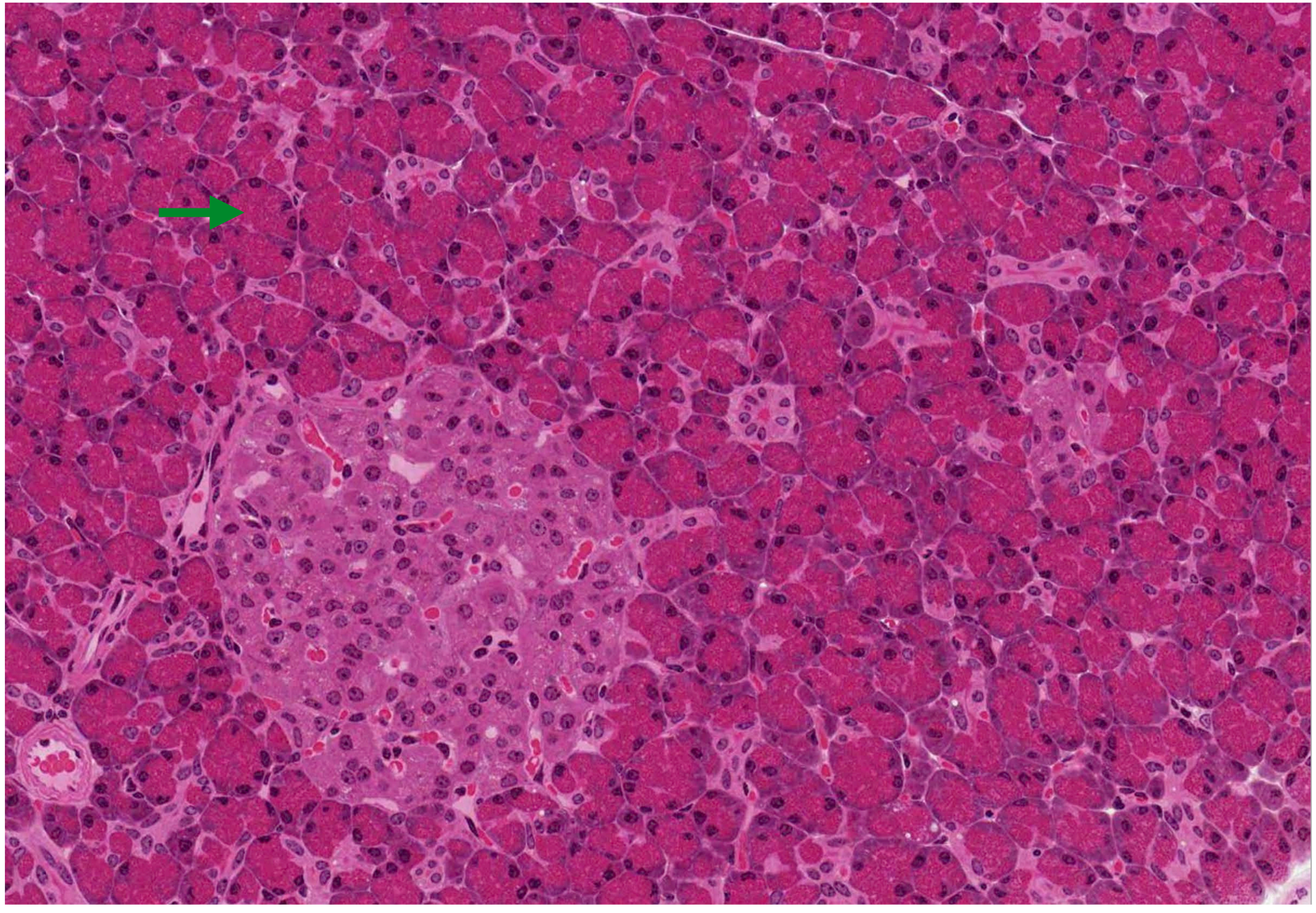
C. Bile

D. Partially oxygenated blood



7. Which protein initiates activation of some of the enzymes secreted by these cells?

- Enterokinase
- Chymotrypsinogen
- Amylase
- Pepsin



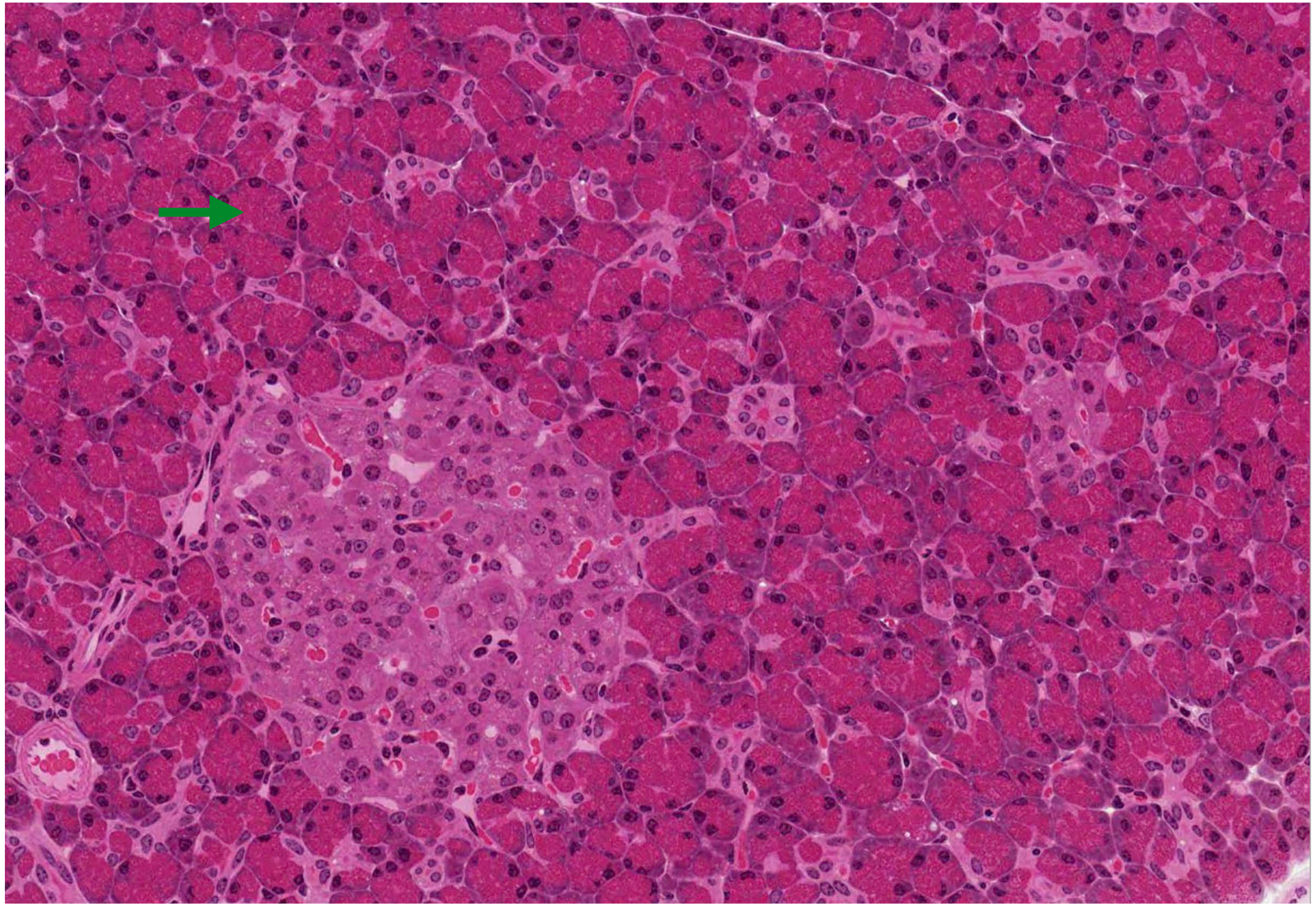
8. The cells marked in question 7 are stimulated by which hormone?

A. Cholecystokinin

B. Secretin

C. Somatostatin

D. Insulin



Application Questions

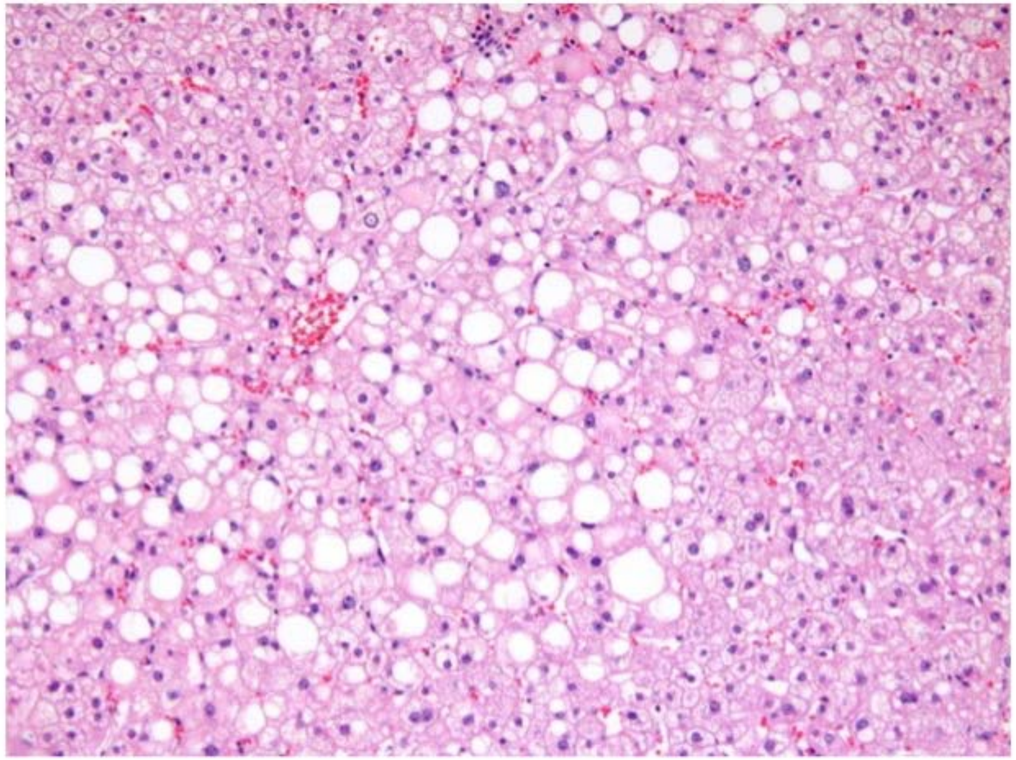
A 54-year old patient comes in for a routine check-up and reports feeling fatigued. The patient has been out of work for several months and reports consuming more than 5 alcoholic drinks per day. A physical exam detects slight hepatomegaly and the patient's blood work shows elevated levels of the liver enzymes alanine aminotransferase (ALT) and aspartate aminotransferase (AST) . A biopsy of the patient's liver reveals the image below.

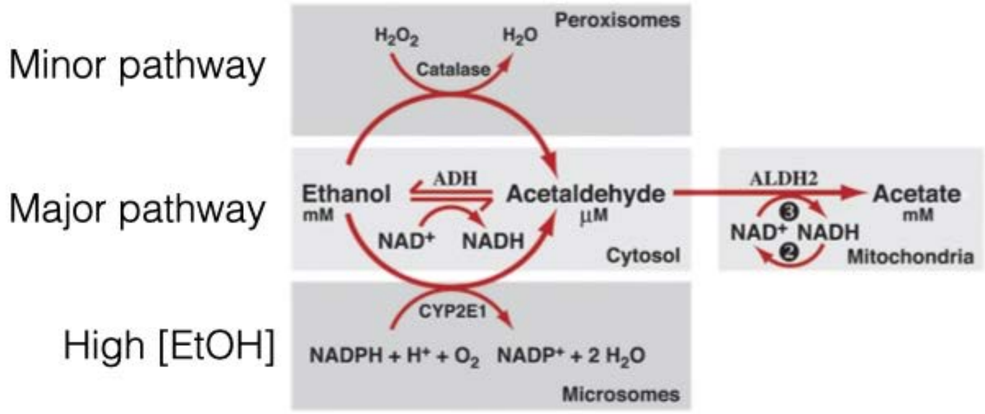
Describe the changes you observe. Are the changes uniform throughout the sample?

What might explain the pathology seen in the biopsy. For reference, a diagram of alcohol metabolism is shown..

At this stage, what would be the most effective course of action?

What are the potential long-term risks if the patient consumes alcohol at a similar or increased rate? What changes would you expect to find in a biopsy of the patient's liver?





An 8-year old presents with nausea, vomiting and upper, abdominal pain. A physical exam finds tenderness in the upper abdomen. The patient's blood measures amylase at 295 U/L(normal range: 30 - 110 U/L) and lipase a 745 U/L (normal range 0 - 160 U/L)..

A biopsy from the patient's pancreas produces the image below.

Describe the structural and cellular changes in the patient's pancreas.

Genetic sequencing reveals a single mutation in the patient's PRSS1 gene which encodes for trypsinogen. How might the mutation lead to structural changes seen in the image?