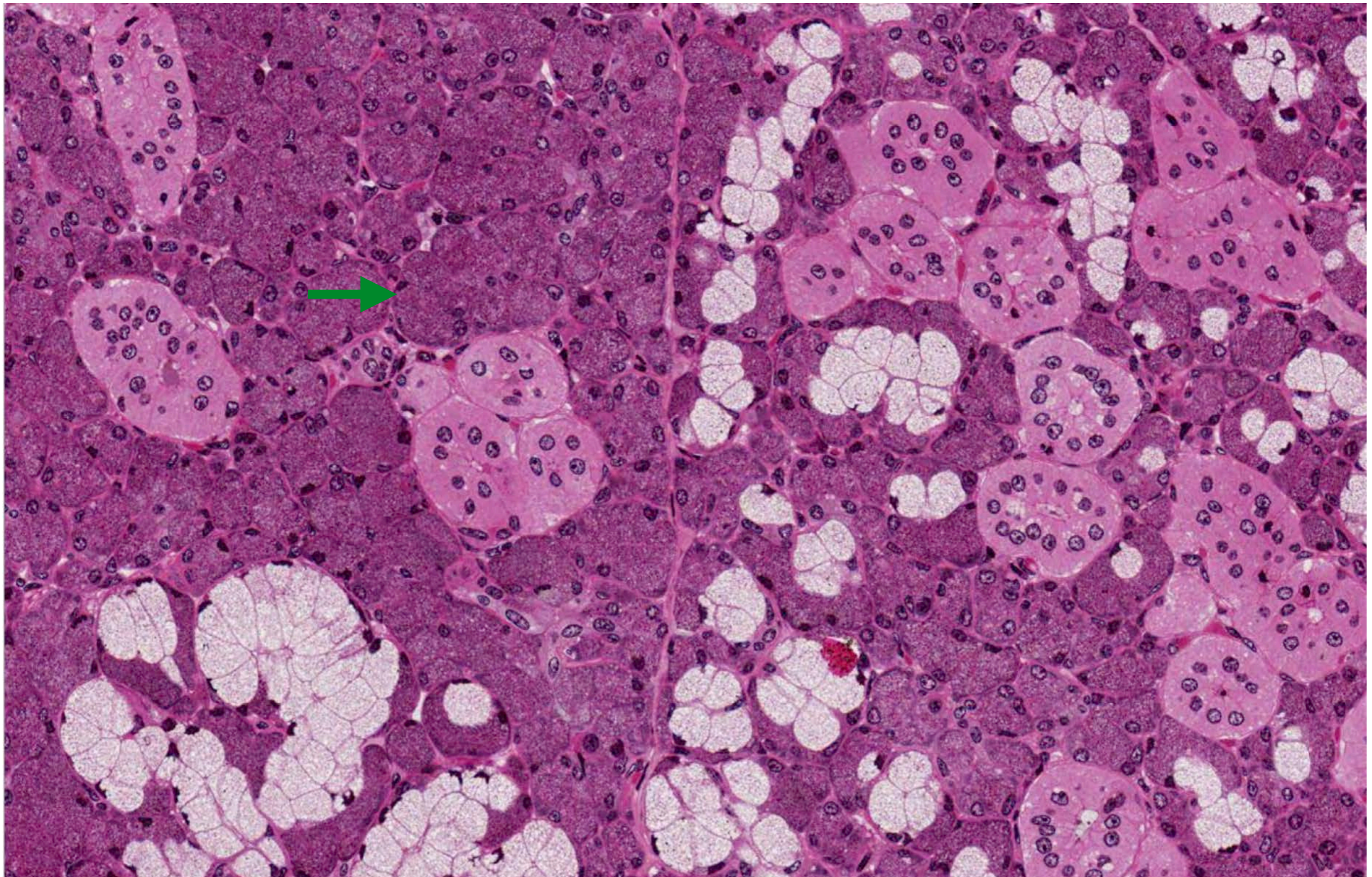


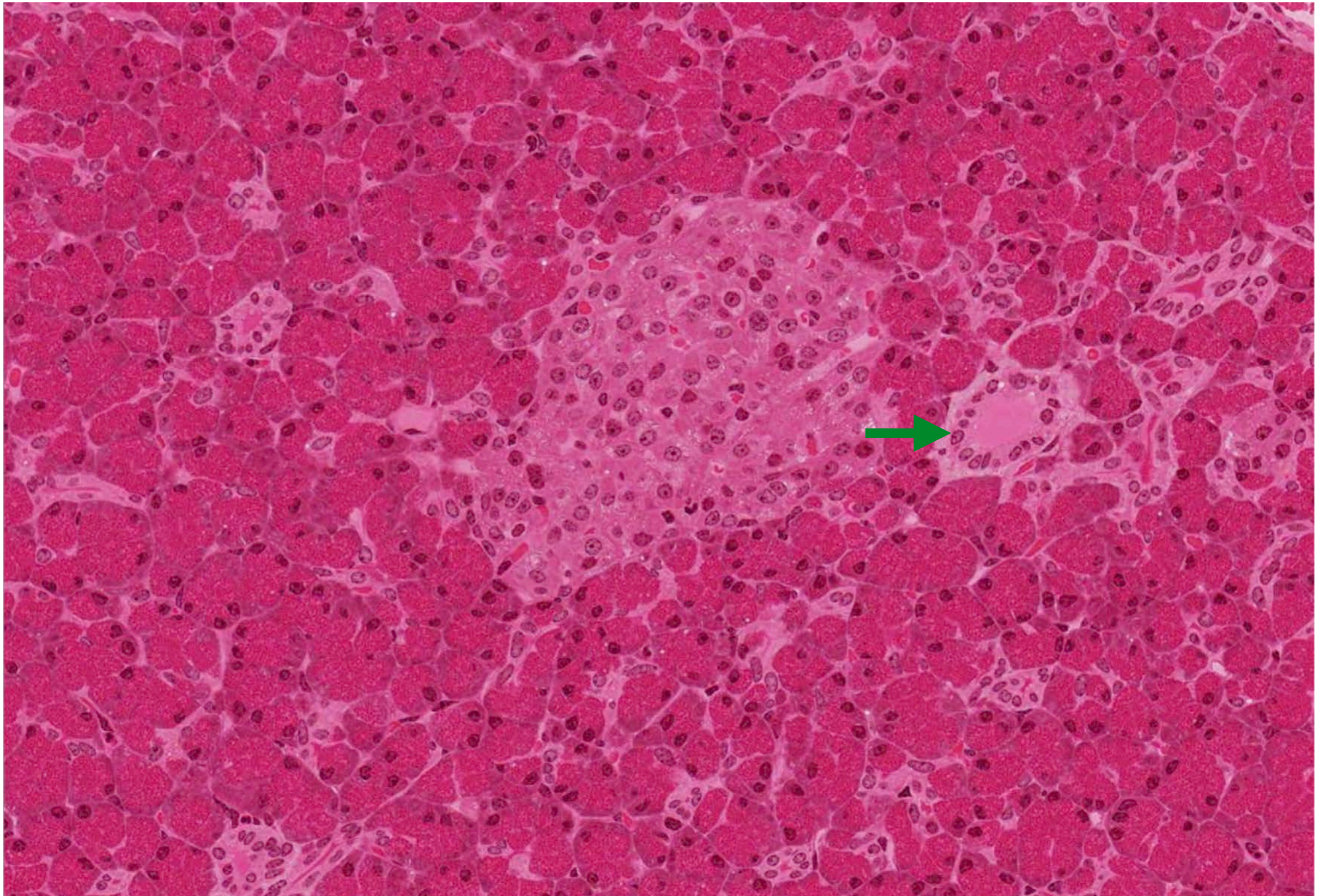
1. These cells (arrow) primarily produce which of the following?

- Chymotrypsin
- Trypsin
- Pepsinogen
- Amylase



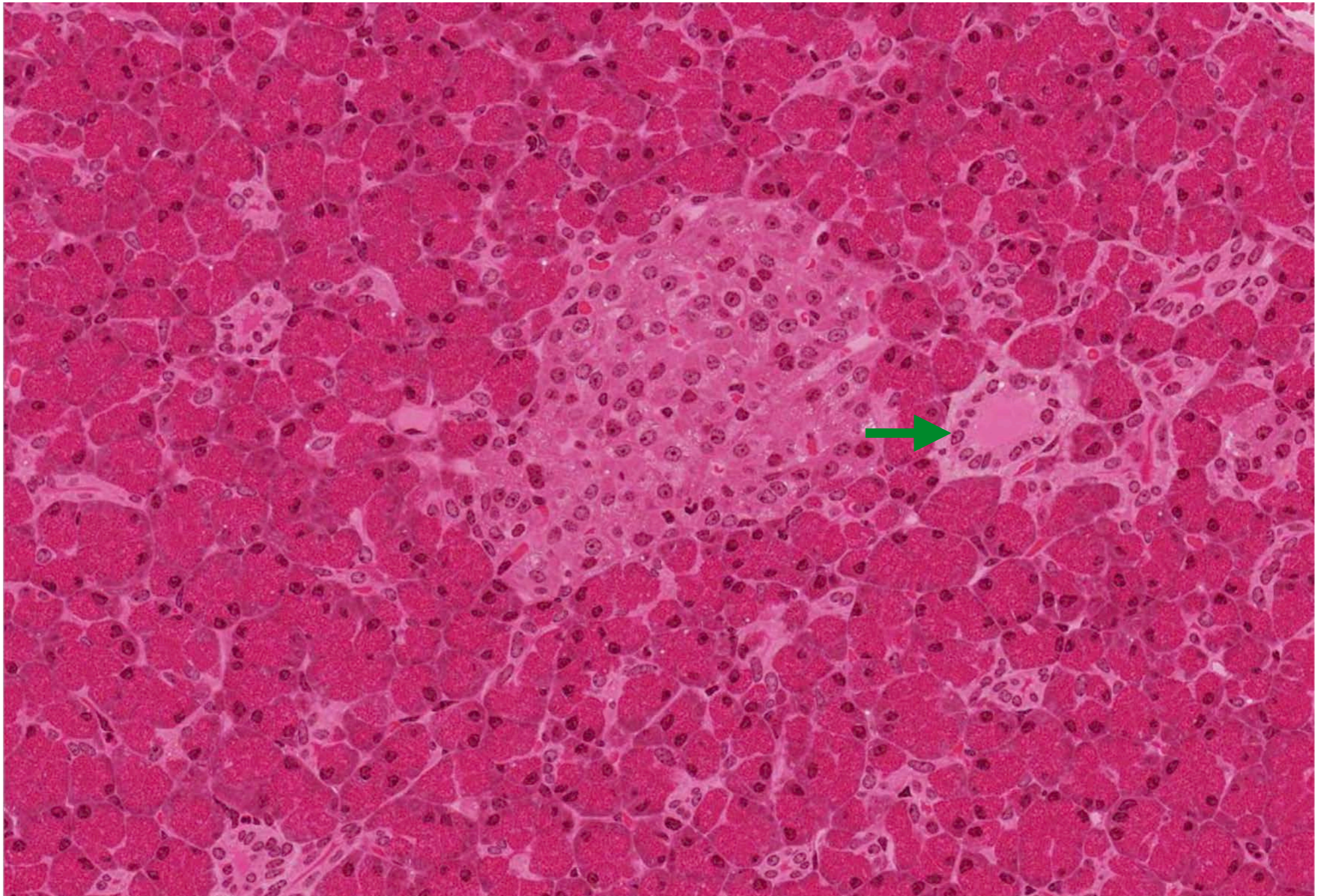
2. These cells (arrow) secrete which of the following?

- Bicarbonate
- Sodium
- Potassium
- Mucus



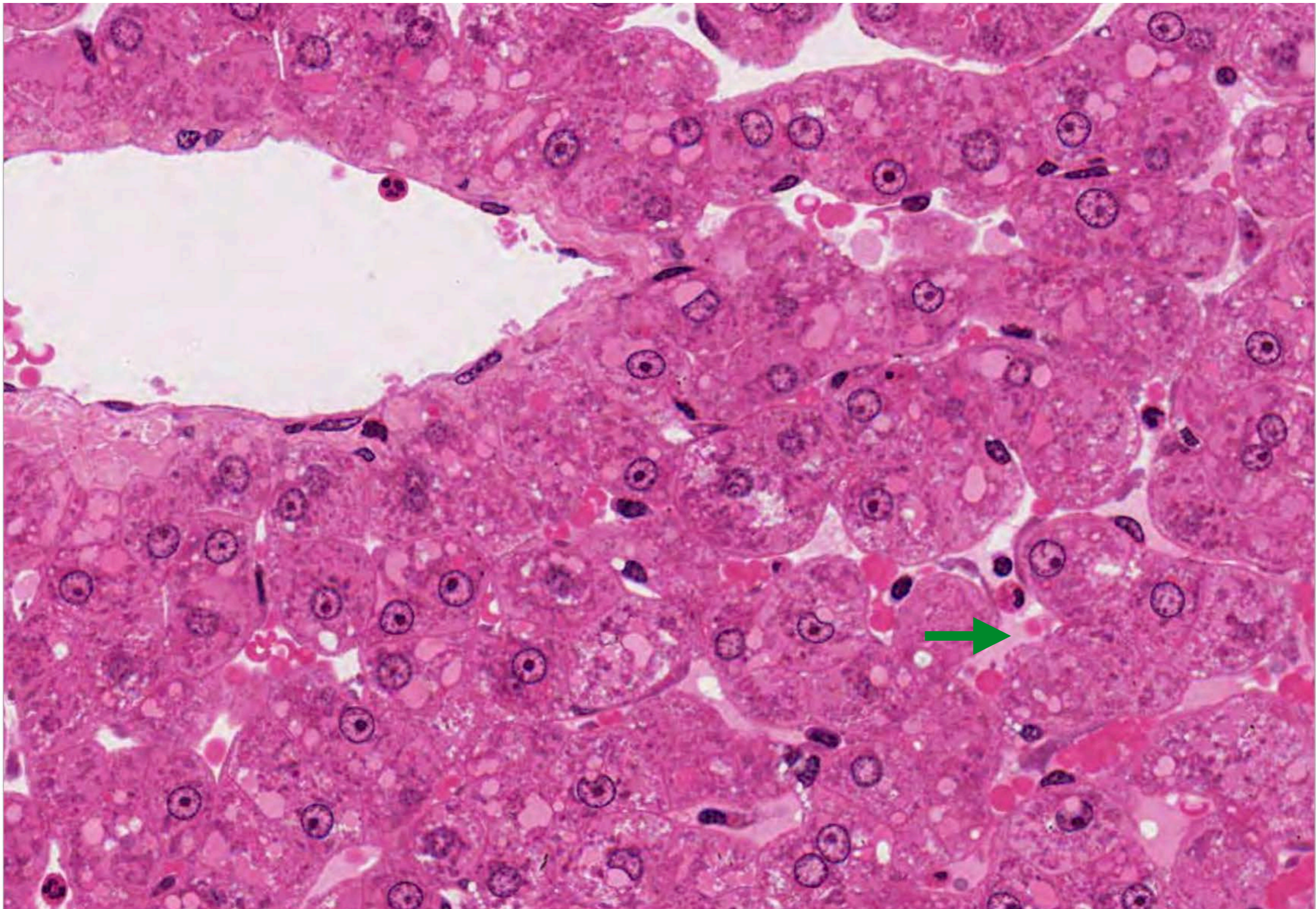
3. What hormone stimulates these cells?

- A. Cholecystokinin
- B. Secretin
- C. Gastrin
- D. Histamine



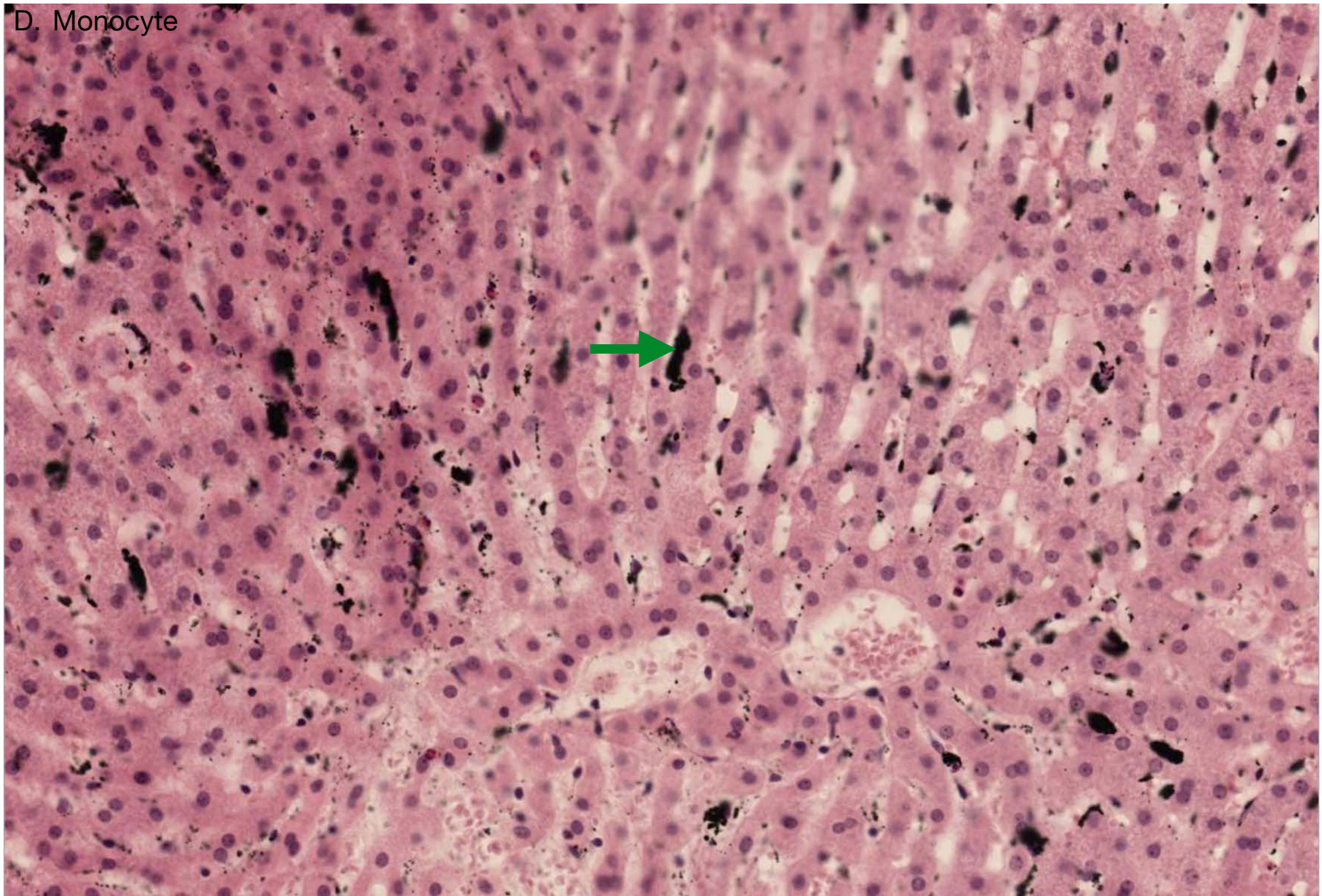
4. This structure (arrow) in the liver is defined by which of the following?

- A. Continuous endothelium
- B. Fenestrated endothelium
- C. Discontinuous endothelium
- D. Simple cuboidal epithelium



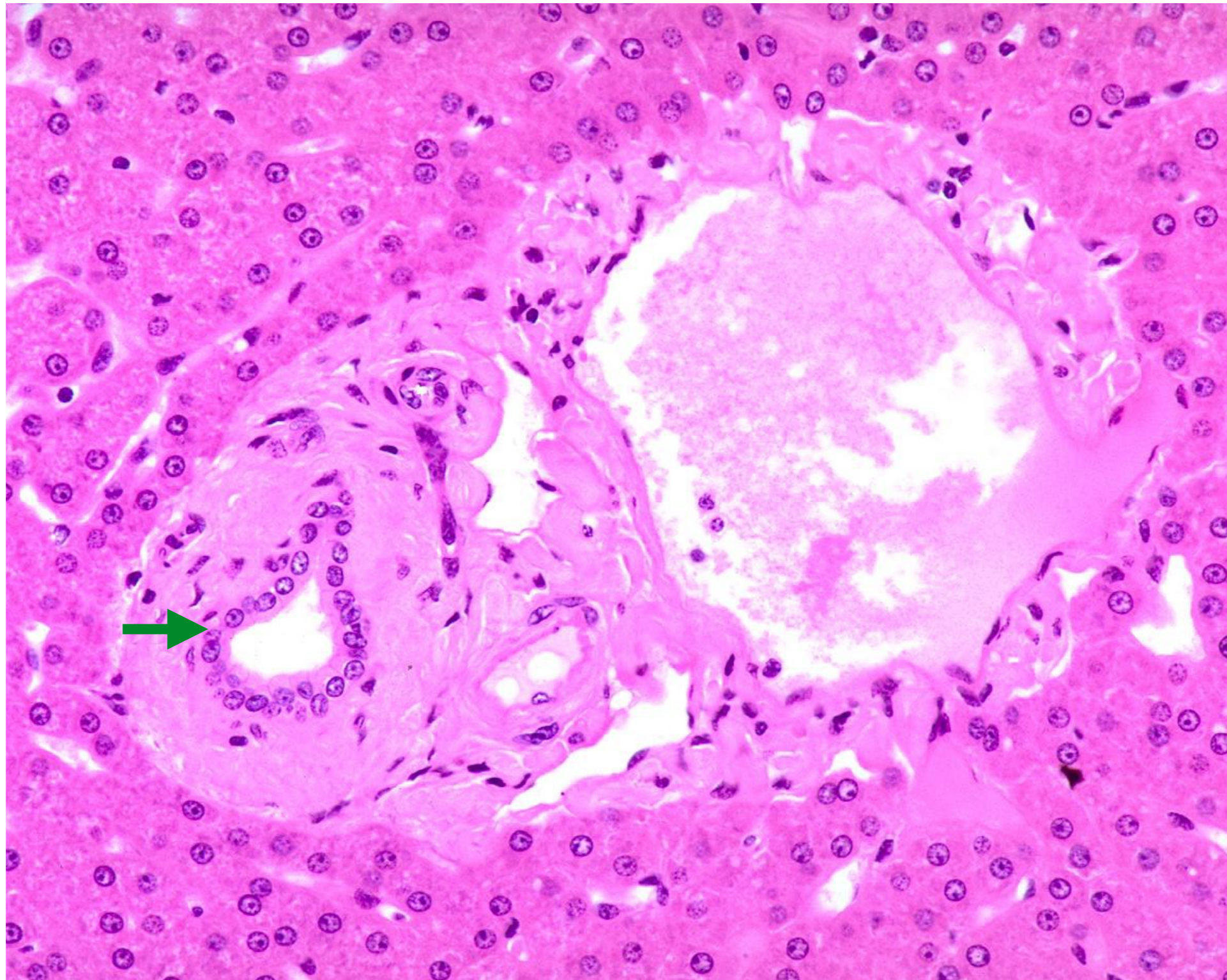
5. Carbon black nanoparticles are found in a variety of consumer products, including laser printers and makeup. Identify this cell from an animal that was exposed to high concentration of carbon black nanoparticles.

- A. Dust cell
- B. Kupffer cell
- C. Hepatocyte
- D. Monocyte



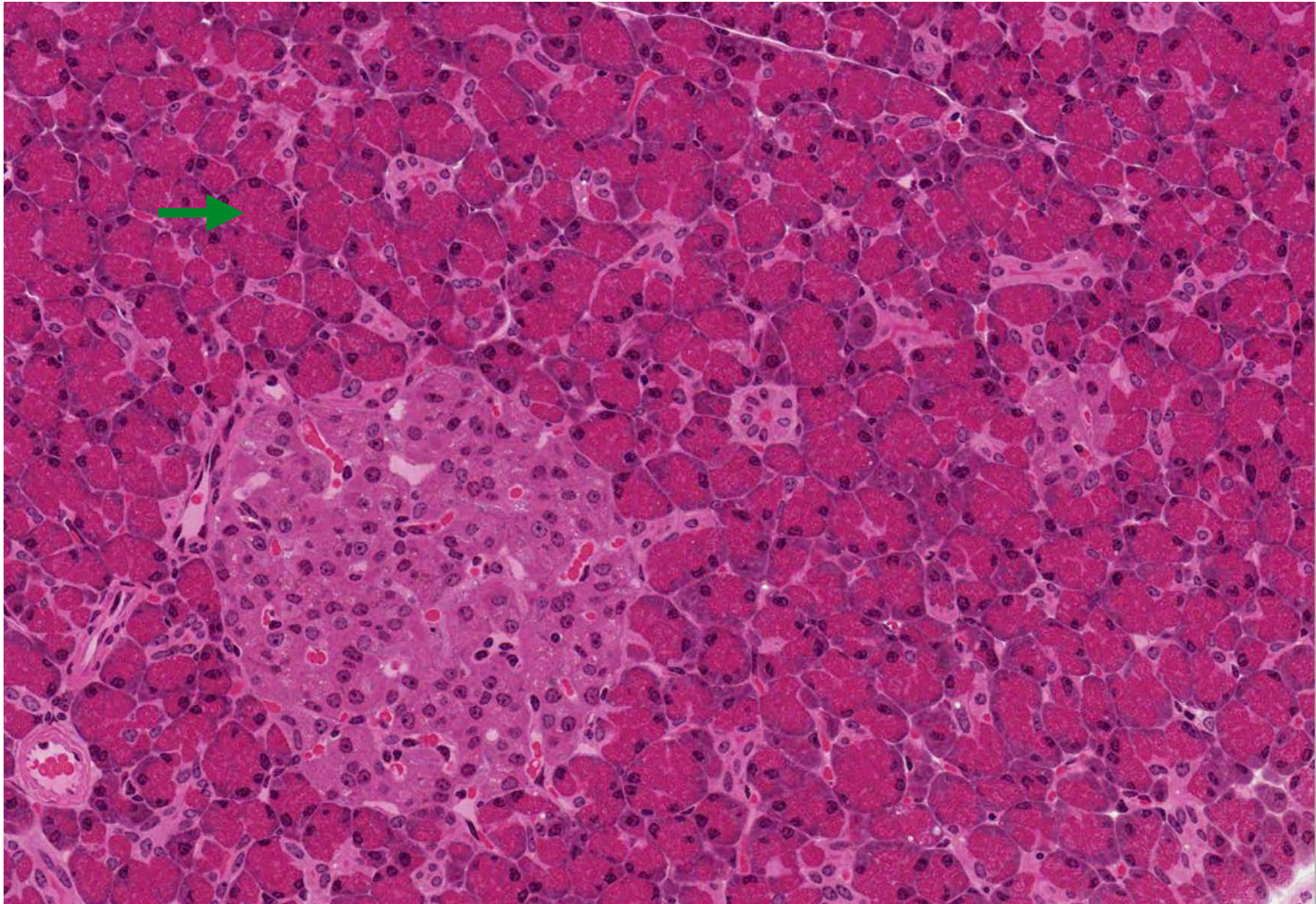
6. This structure conveys which of the following?

- A. Lymph
- B. Fully oxygenated blood
- C. Bile
- D. Partially oxygenated blood



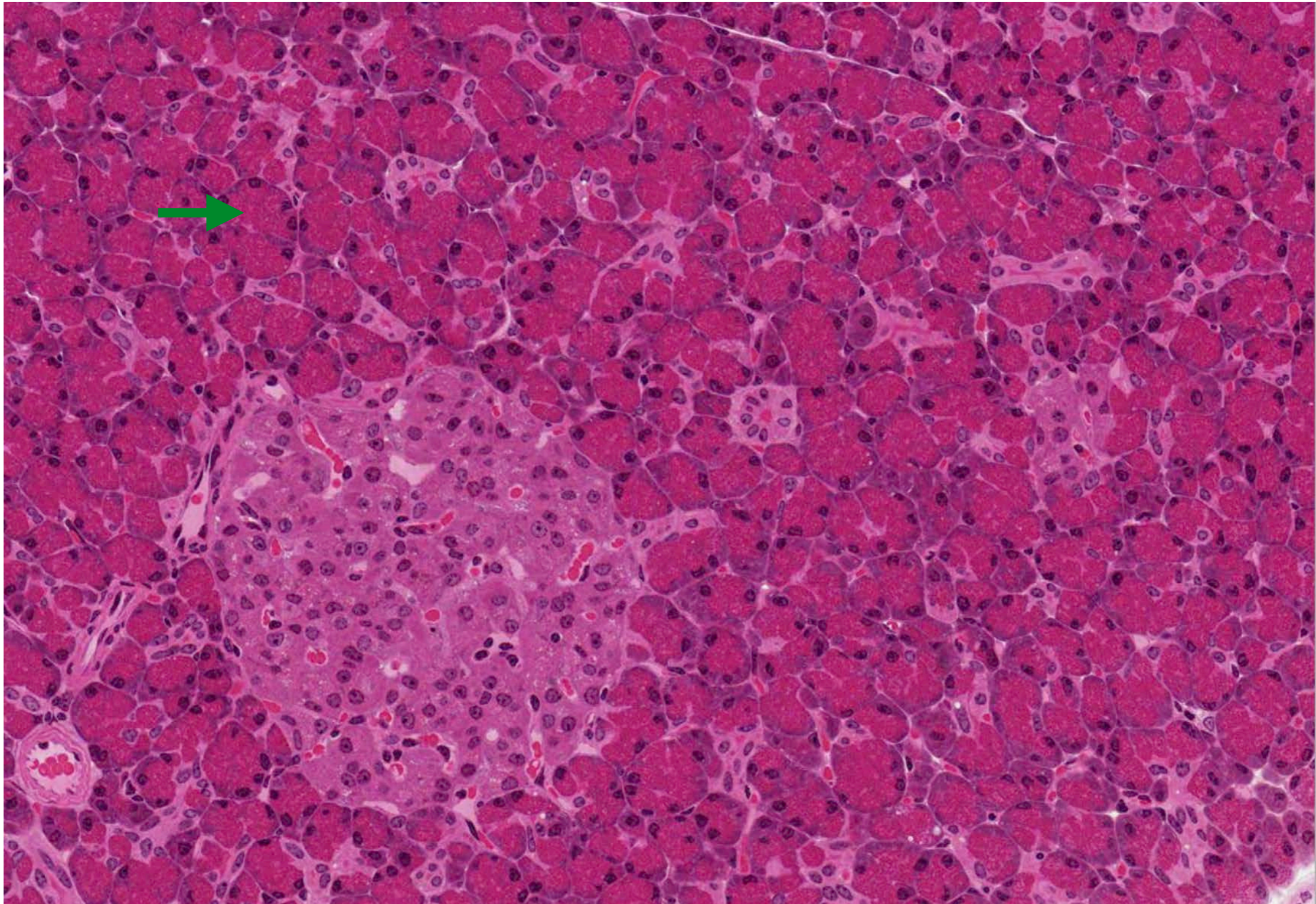
7. Which protein initiates activation of some of the enzymes secreted by these cells?

- Enterokinase
- Chymotrypsinogen
- Amylase
- Pepsin



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

- A. Cholecystokinin
- B. Secretin
- C. Gastrin
- D. Histamine





You see a patient who recently lost their job and reports consuming 4 to 5 alcoholic drinks per day while out of work. A physical exam detects slight hepatomegaly and the patient's blood work shows elevated levels of liver enzymes. A biopsy of the patient's liver reveals the image below.

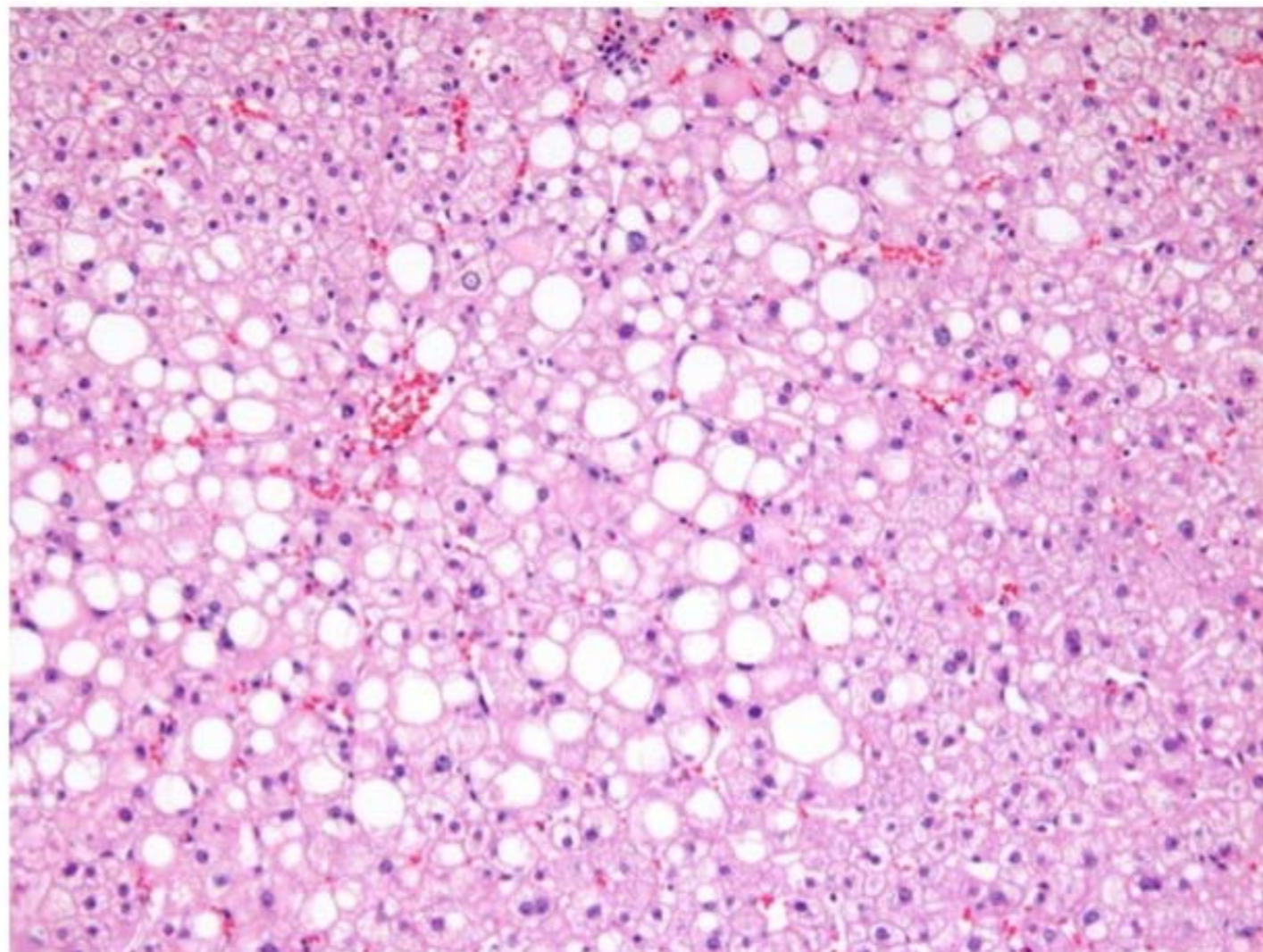
Describe the changes you observe. Are the changes uniform throughout the sample?

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

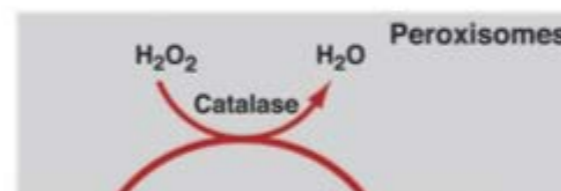
At this stage, what would be the most effective course of action?

The patient struggles to find work and eventually loses their health care coverage.

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?



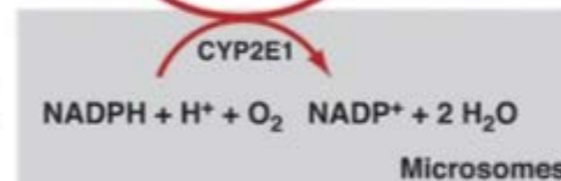
Minor pathway



Major pathway



High [EtOH]



A patient presents with nausea, vomiting and upper, abdominal pain. A physical exam finds tenderness in the upper abdomen, and the patient's history reveals several years of heavy alcohol consumption. The patient's blood shows above normal levels of lipase and amylase.

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

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

What mechanisms might produce the structural changes seen in the patient's pancreas?

