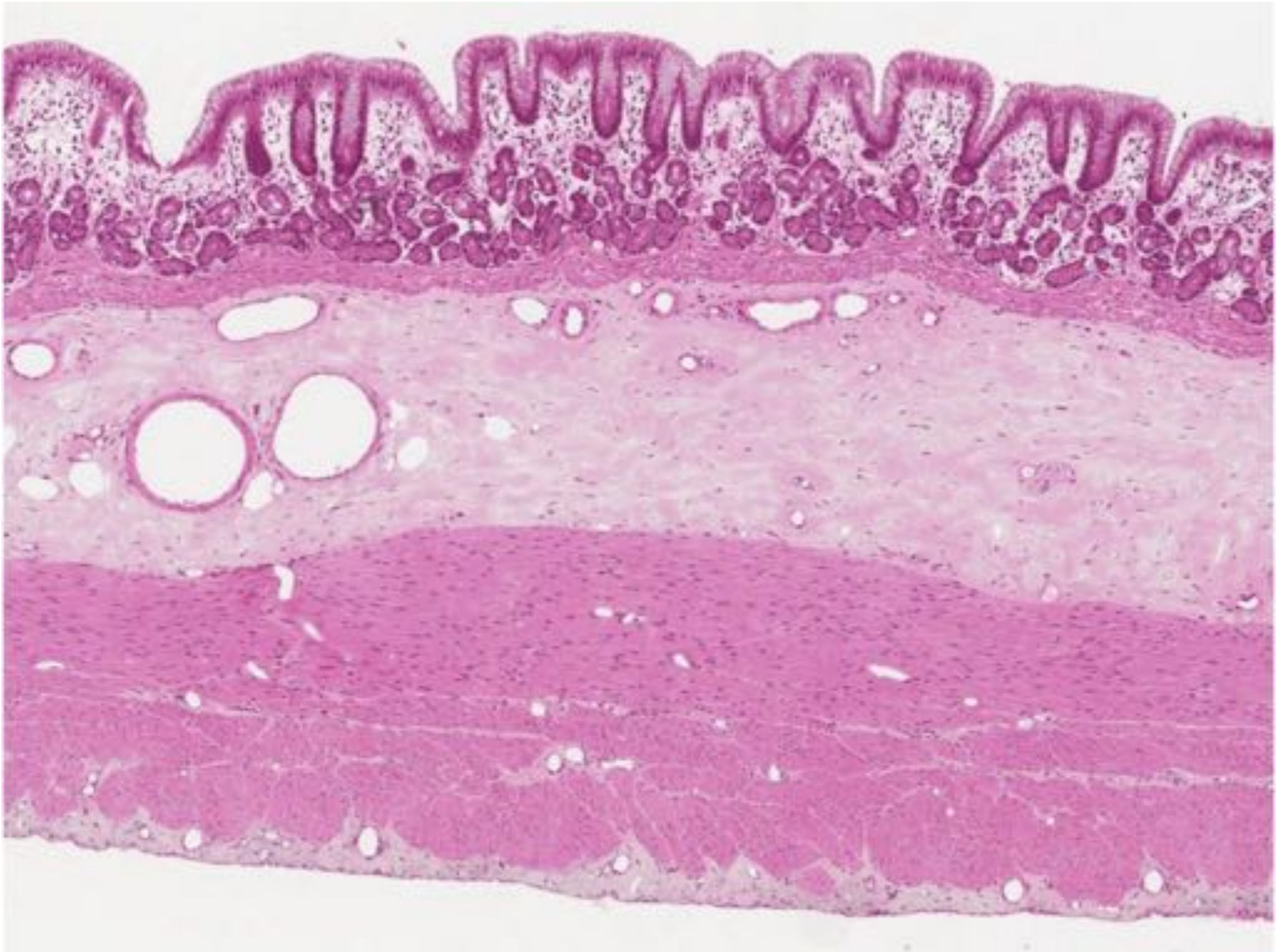


1. What is this primary function of this region of the gastrointestinal tract?

- Produce mucus
- Secrete acid
- Absorb nutrients
- Concentrate feces



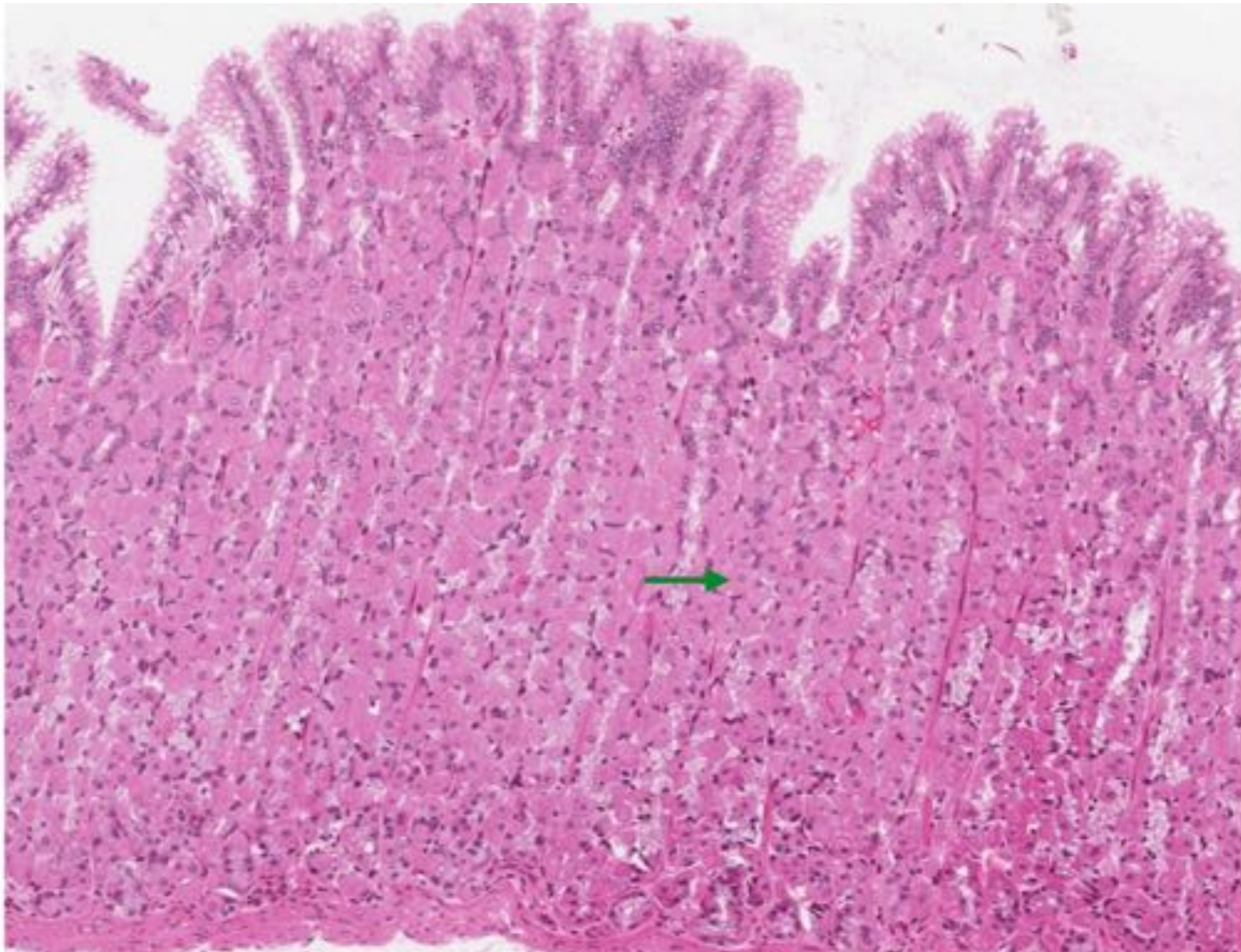
2. Which physiological process occurs in this region of the GI tract?

- Acid production
- Bicarbonate production
- Nutrient absorption
- Pepsinogen production



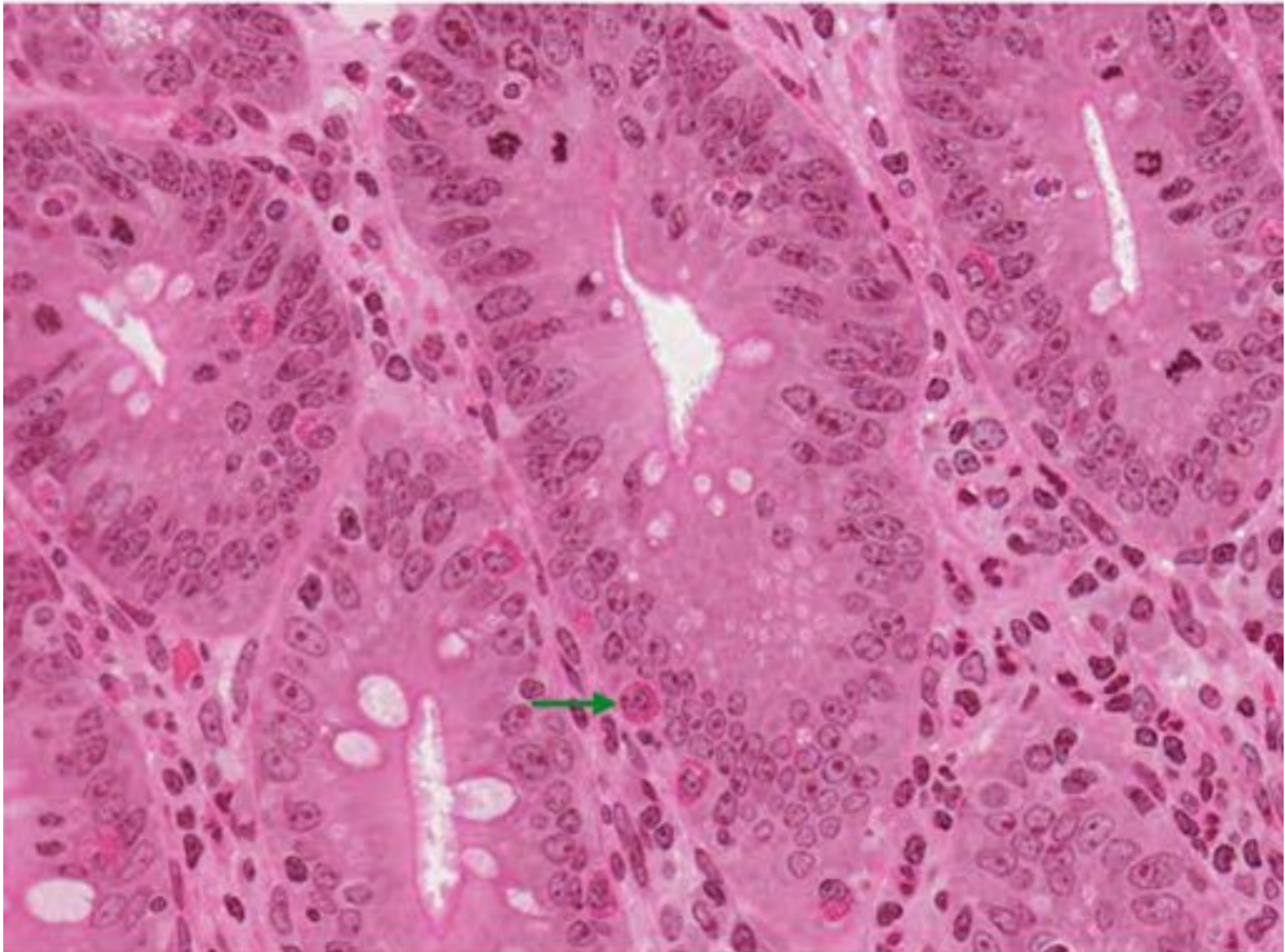
3. Which molecule decreases secretion from the cell indicated by the arrow?

- Gastrin
- Somatostatin
- Acetylcholine
- Histamine



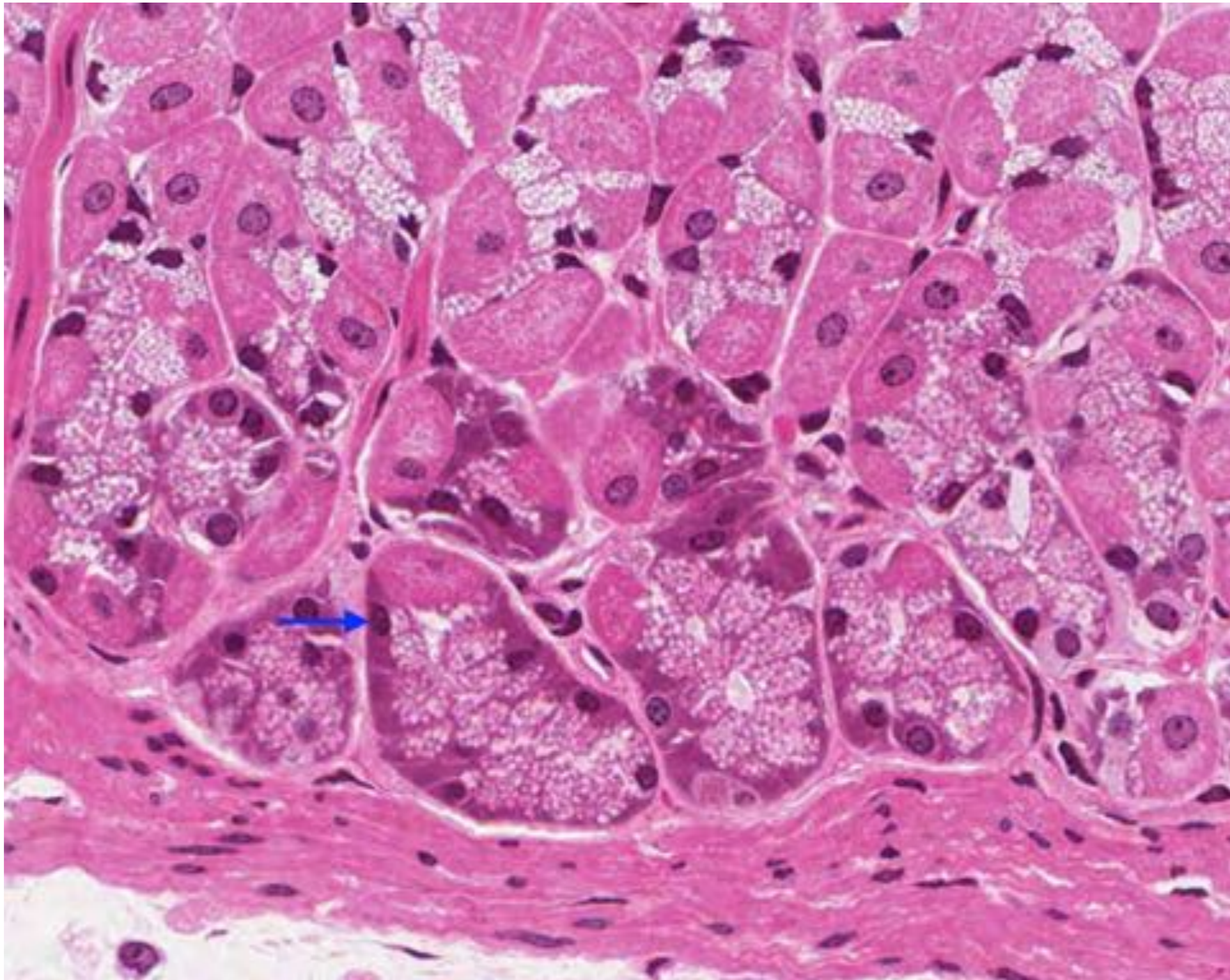
4. This cell in the small intestine releases factors that affect which activity?

- Acid secretion
- Secretion of pepsinogen
- Bicarbonate release
- Microbial growth



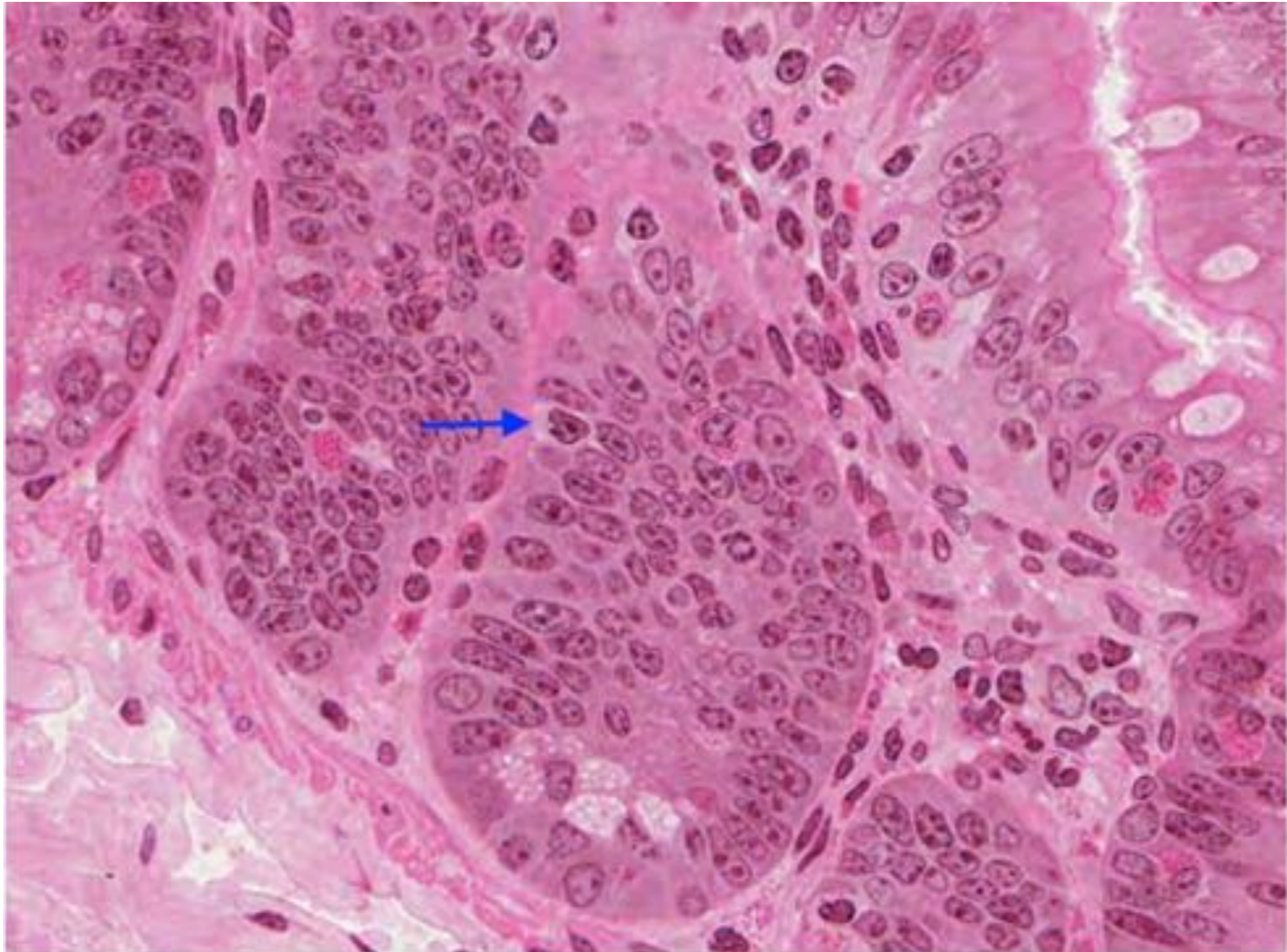
5. What does this cell in the stomach secrete?

- Hydrogen ions
- Gastrin
- Pepsinogen
- Histamine



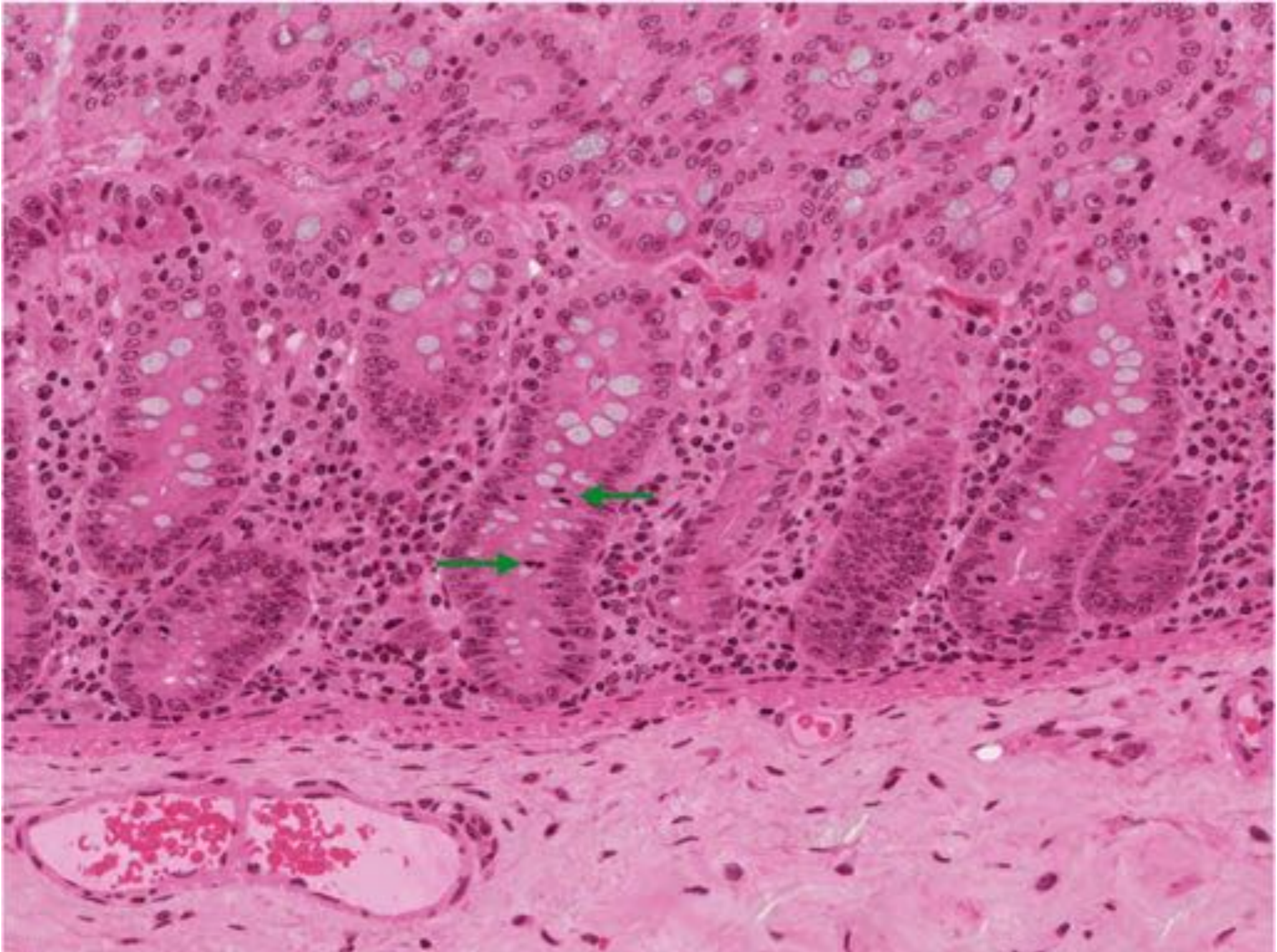
Which process would be least affected by a mutation that inhibited secretion from this type of cell in the small intestine?

- Rate of bicarbonate production
- Rate of acid production
- Rate of digestive enzyme production
- Rate of peristalsis



7. These cells in small intestine are an indication of what process?

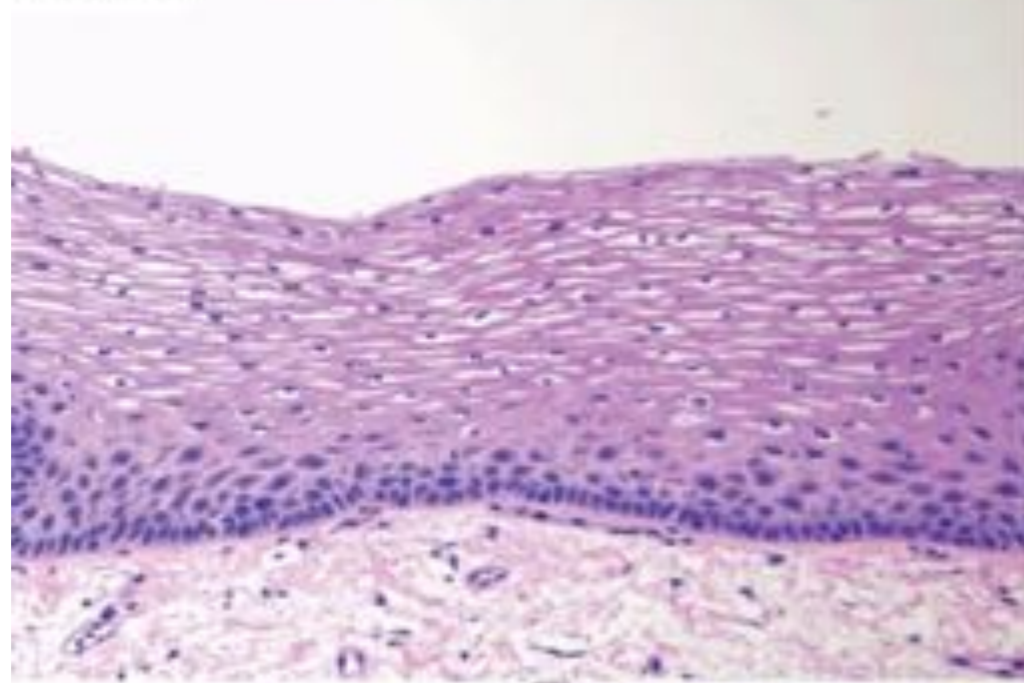
- Tumorigenesis
- Hormone secretion
- Protein secretion
- Epithelial renewal



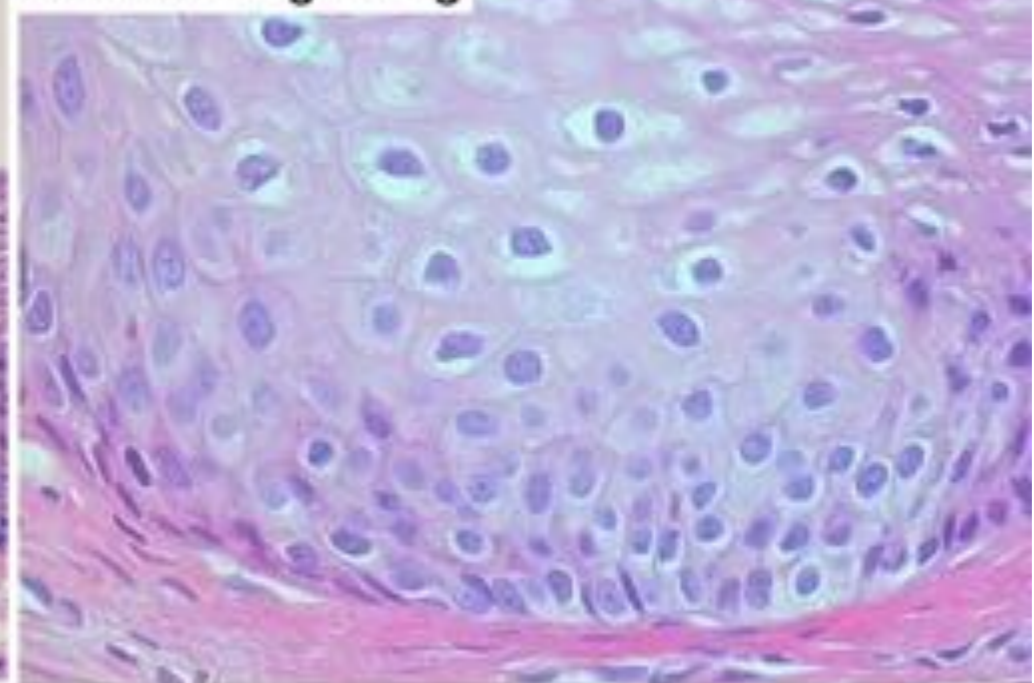
A patient presents with a sensation of burning pain in their chest which is more pronounced after eating. An endoscopy of the esophagus is performed and reveals little observable change, but a biopsy of the esophagus is taken from just above the esophageal-gastric junction. Images from that biopsy are shown below along with samples from normal esophagus for comparison.

- Describe the changes to the epithelium and list the most likely causes for the changes.
- Inhibiting which proteins by drugs might alleviate the patient's symptoms?

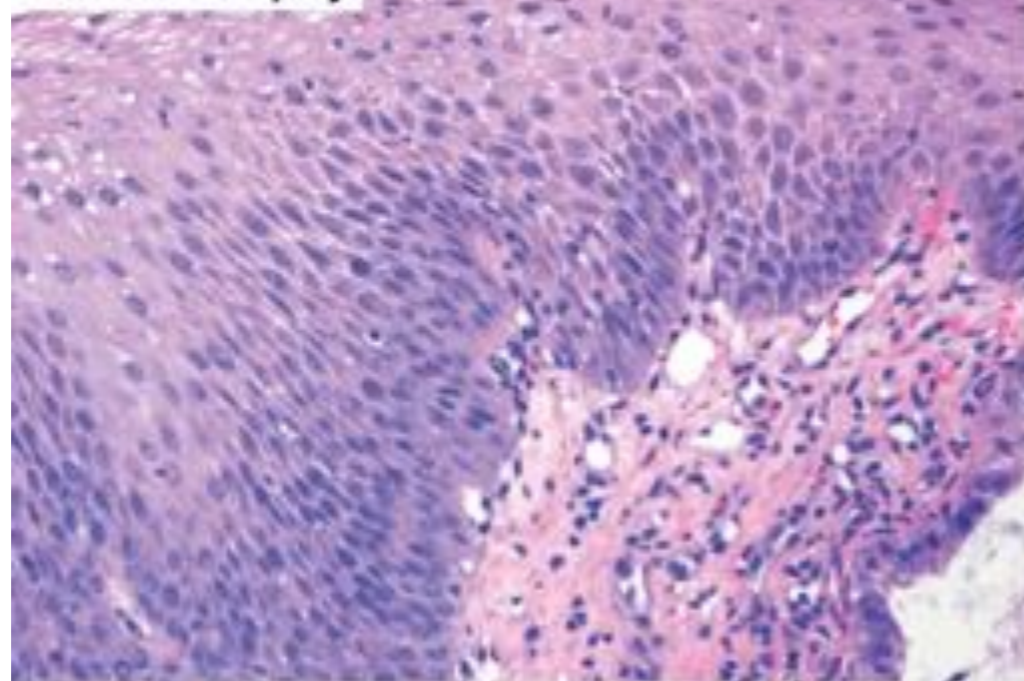
Normal



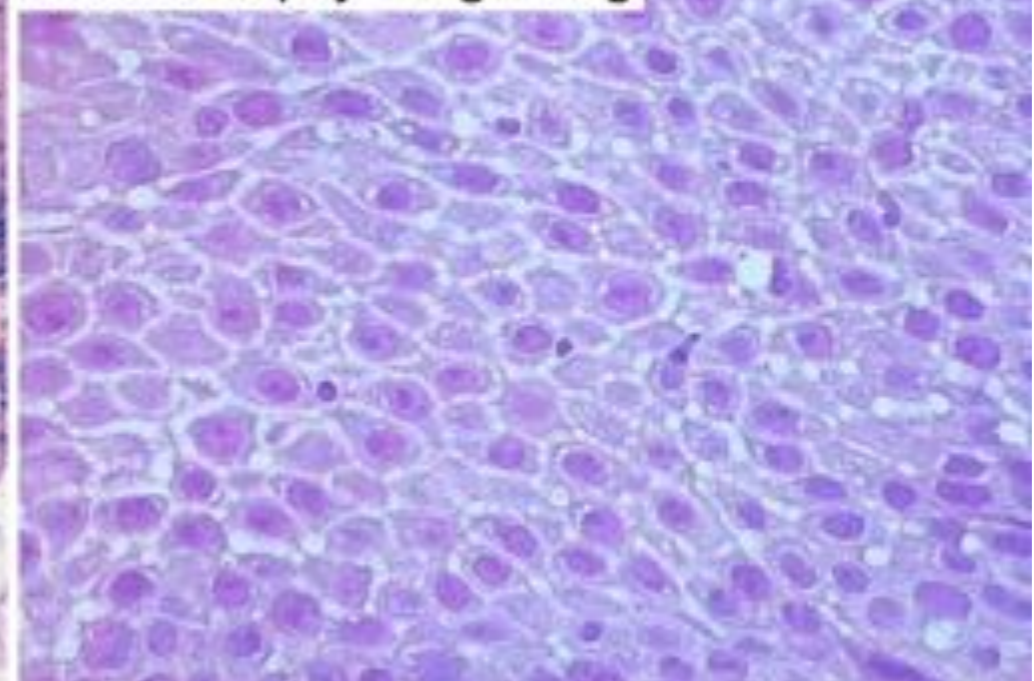
Normal - High Mag



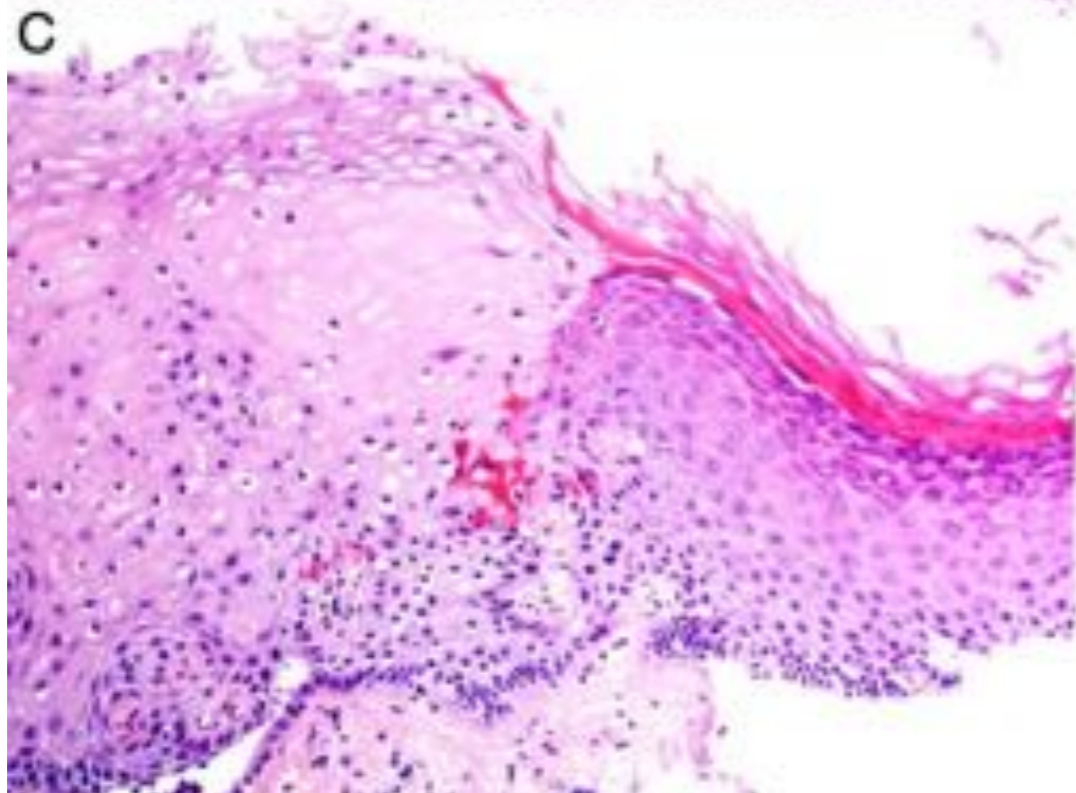
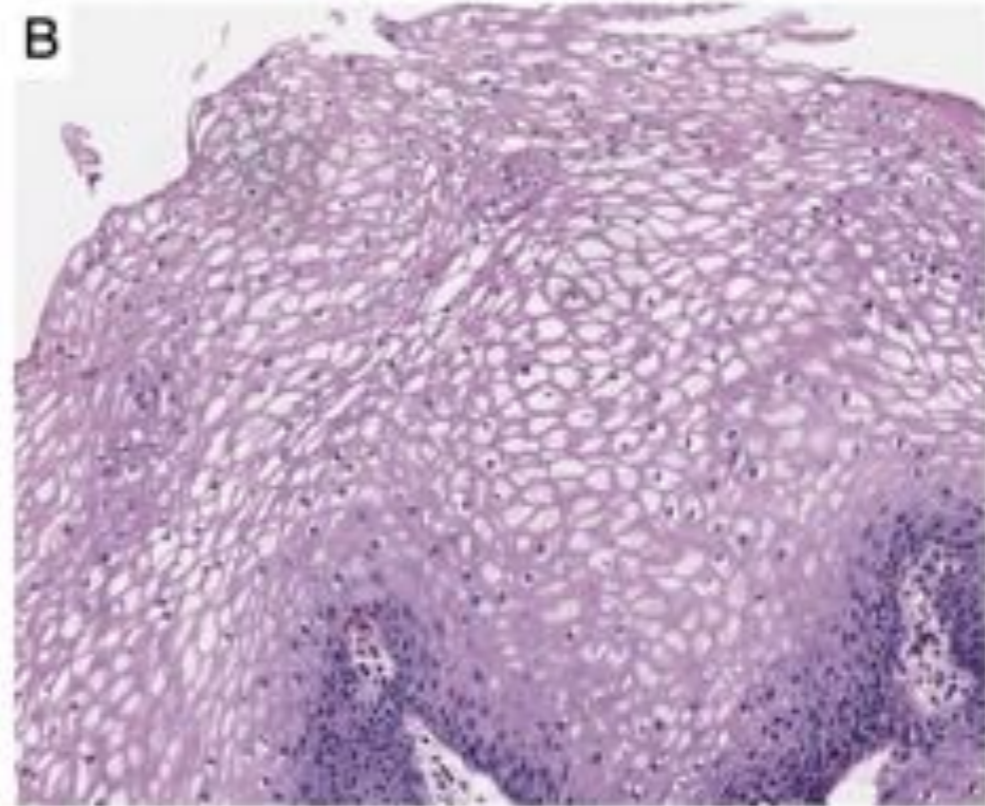
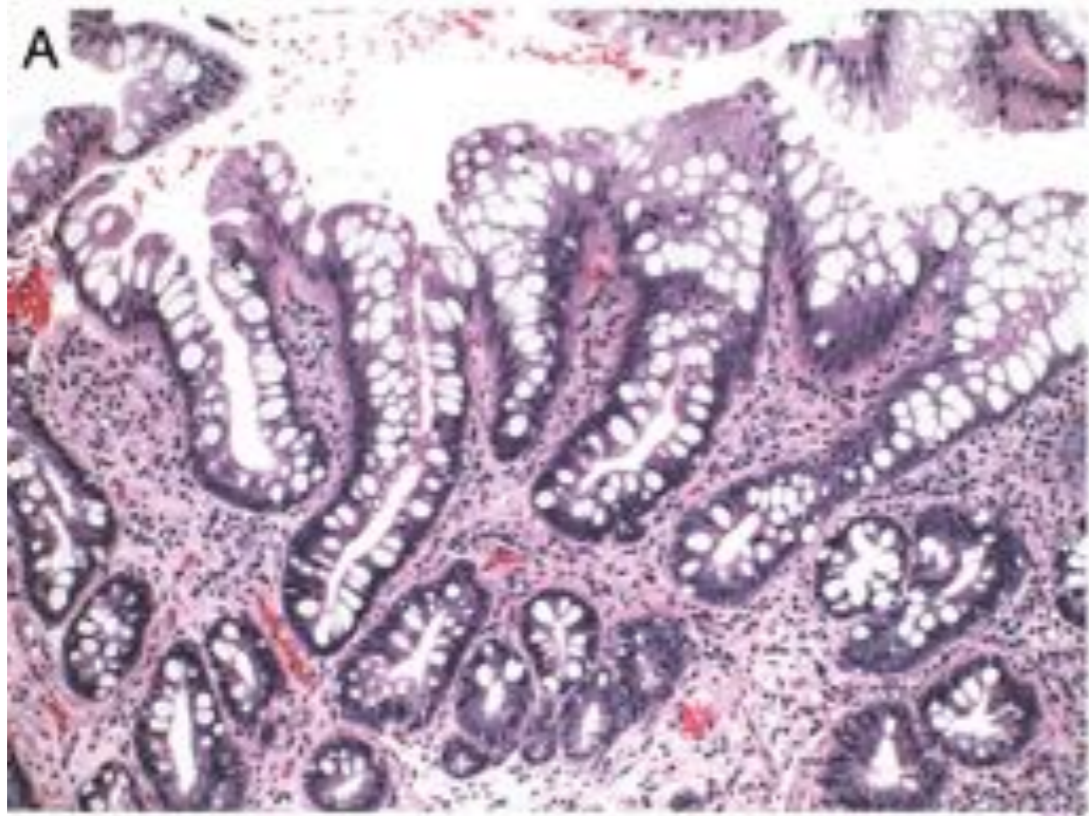
Patient Biopsy



Patient Biopsy - High Mag



If the patient's symptoms are not addressed, which change to the epithelium is most likely? What are potential long-term risks of this change?



A patient presents with repeated episodes of diarrhea and abdominal pain. The patient's recent history shows significant weight loss. Endoscopy is performed and a biopsy of the duodenum is taken. The image below is an H&E stain of the biopsy.

What changes do you observe to overall structure of the mucosa?

Examine the epithelium closely. What changes do you observe?

What explains the structural and cellular changes you observe?

