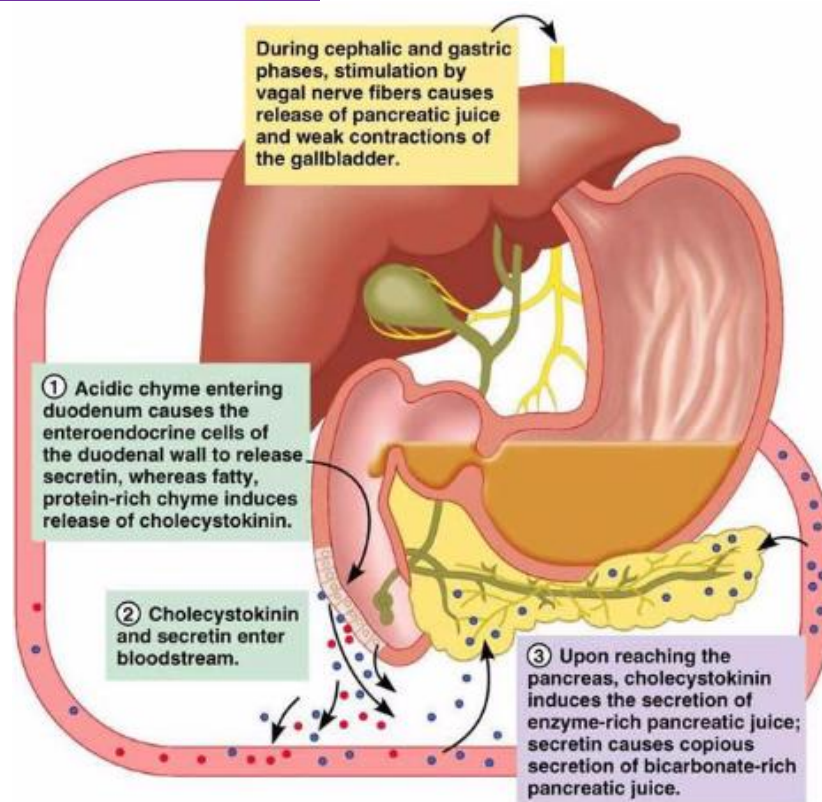




- Phases of pancreatic secretion:

- **Cephalic phase:** depending on signals from the brain.
- **Gastric phase:** depending on signals from the brain.
- **Intestinal phase:** depending on the hormone secretin.

- Exocrine function of the pancreas:



- Up-regulation of Pancreatic secretion:

- Parasympathetic pathway (vagus nerve).
- Gastrin.
- CCK: from duodenum and upper jejunum.
- Secretin: from S-cells of duodenum and jejunum.
- VIP

- Pancreatic secretion:

• **It is an isotonic fluid:**

- ✓ If there is a low flow of this fluid → it will have a high concentration of chloride.
- ✓ If there is a high flow of this fluid → It will have a high concentration of bicarbonate.

Enzyme	Role	Notes
α -amylase	Starch digestion هضم النشاء	Secreted in an active form
Lipase, phospholipase A and colipase	Fat digestion	
Proteases	Protein digestion	<ul style="list-style-type: none"> • Includes: trypsin, chymotrypsin, elastase and carboxypeptidases. • Secreted as proenzymes also known as zymogens
Trypsinogen	Converted to active enzyme trypsin → activation of other proenzymes and cleaving of additional trypsinogen molecules into active trypsin (positive feedback loop)	<ul style="list-style-type: none"> • Converted to trypsin by enterkinase/ enteropeptidase, a brush-border enzyme on the duodenal and jejuna mucosa



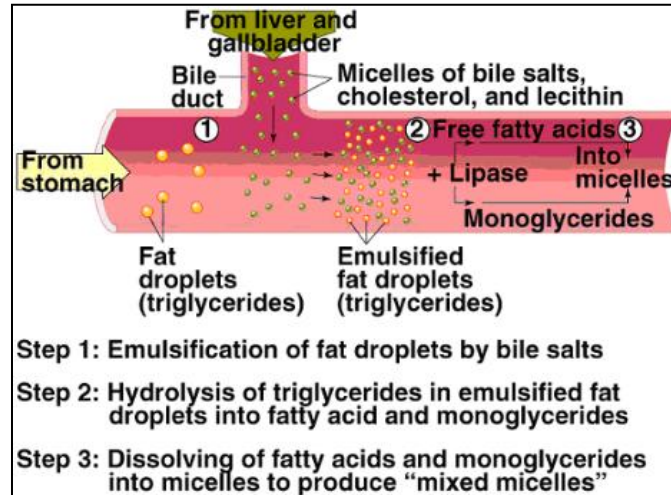
- **Carbohydrate absorption:**

- Only monosaccharides (glucose, galactose and fructose) are absorbed by enterocytes.
- Glucose and galactose are taken up by Sodium-Glucose Transporter-I (SGLT1).
- Fructose is taken up by facilitated diffusion by GLUT-5.
- All are transported to blood by GLUT-2.

- **Protein digestion:**

- Trypsin and chymotrypsin split proteins into peptides.
- Carboxypolypeptidase splits peptides into amino acids.

- **Fat digestion:**



- Pancreatic lipase and colipase hydrolyze neutral fat.
- Cholesterol esterase hydrolyzes cholesterol esters.
- Phospholipase A₂ splits fatty acids from phospholipids.

- **Vitamin/ mineral absorption:**

- **Iron:** absorbed as Fe²⁺ in duodenum.
- **Folate:** absorbed in jejunum and ileum.
- **B₁₂ (cobalamine):** absorbed in terminal ileum along with bile acids. It requires intrinsic factor which is secreted by parietal cells in the stomach.