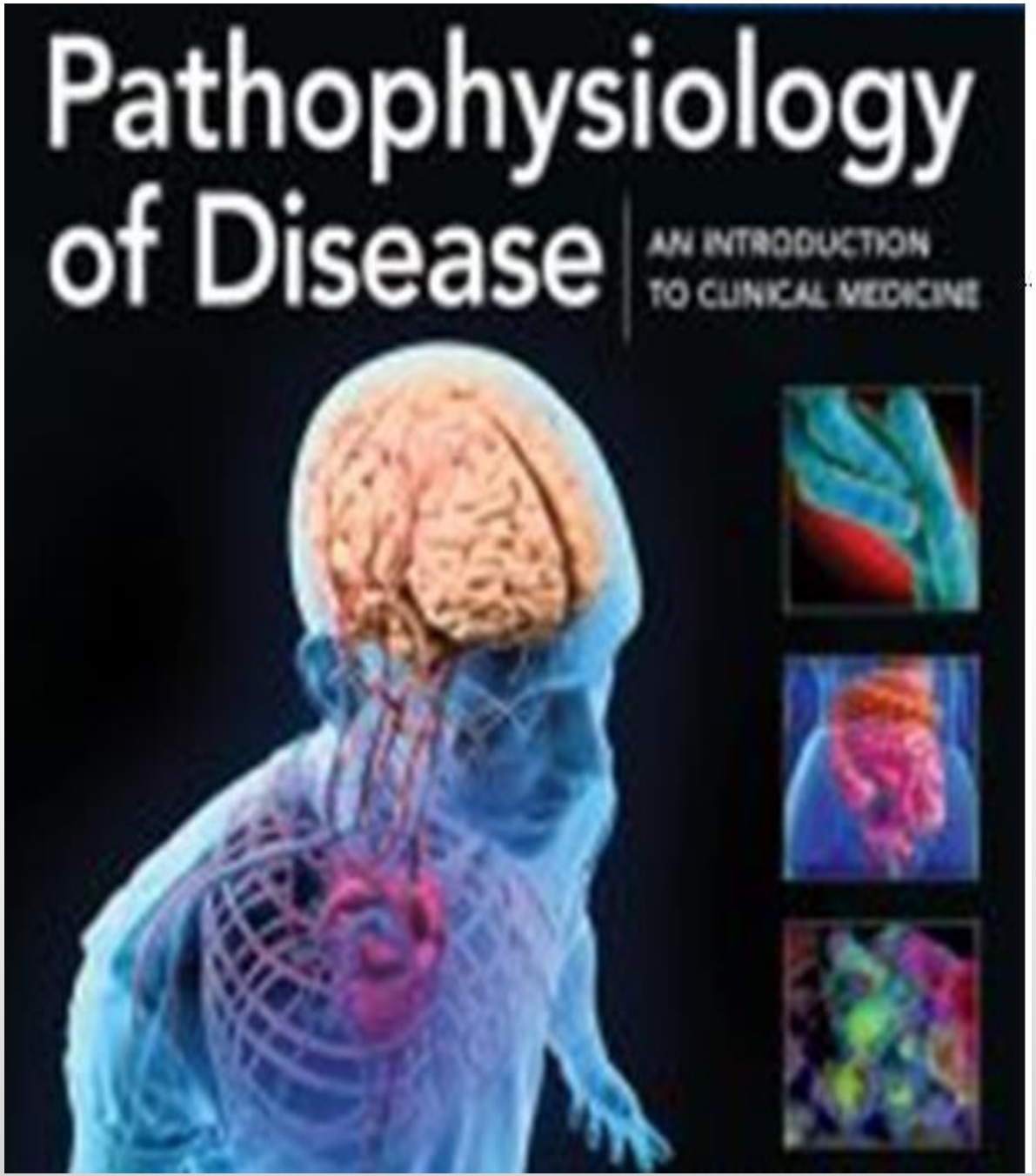
Pathophysiology
College of pharmacy 3rd stage

Cellular adaptation

Lung, prostate, GIT disorders &

Thrombus slides



Adaptations

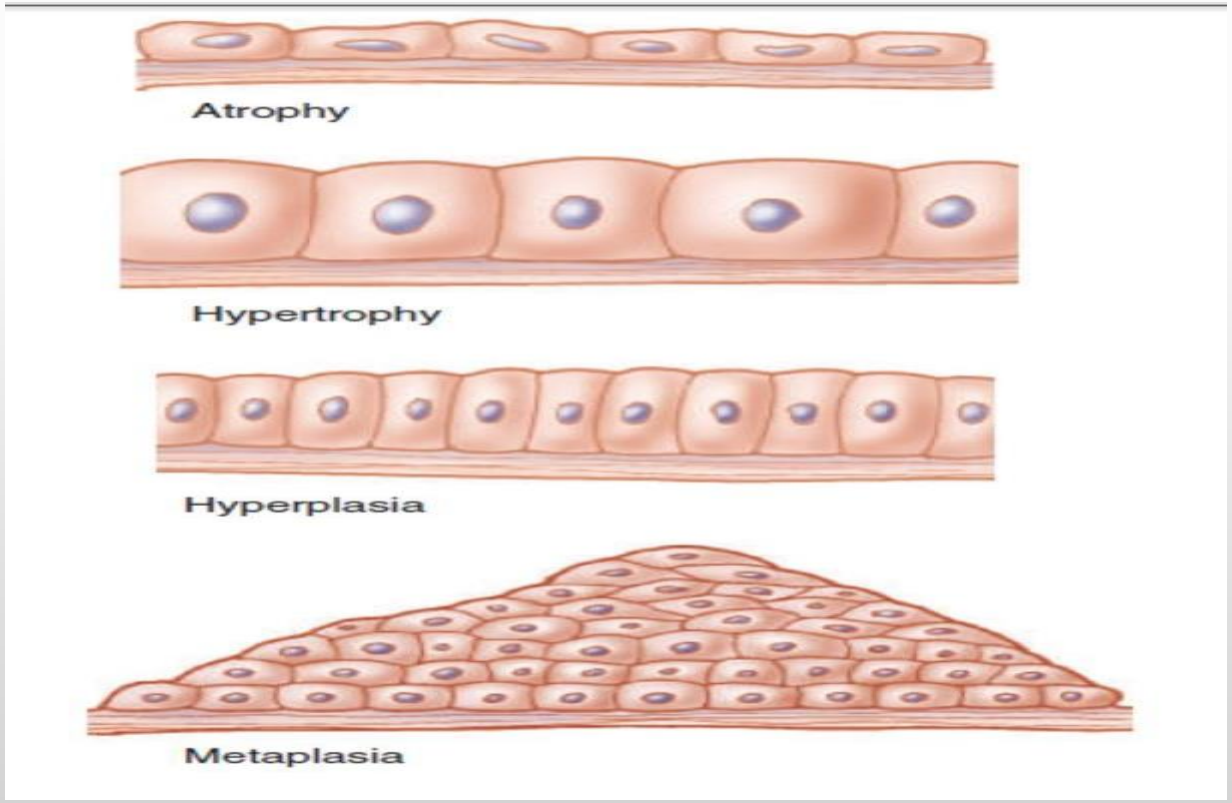
- Adaptations are reversible functional and structural responses to more severe physiologic stresses and some pathologic stimuli.
- During, which new but altered steady states are achieved, allowing the cell to survive and continue to function.

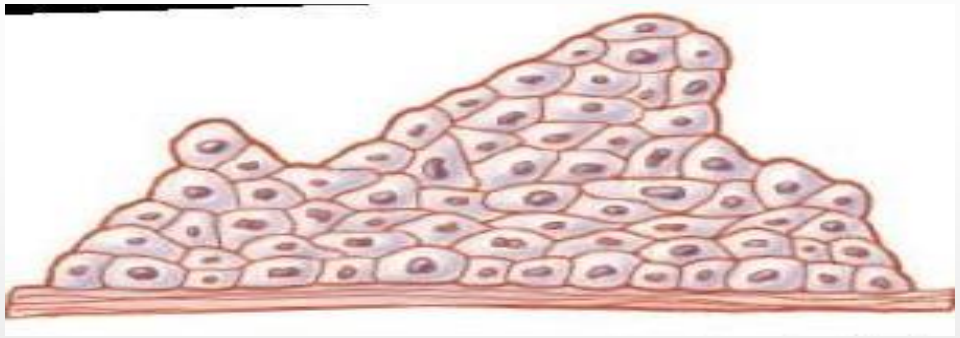
Types of Adaptations

- **Hypertrophy** is an increase in the size of cells and functional activity.
- **Hyperplasia** is an increase in the number of cells.
- **Atrophy** is a decrease in the size and metabolic activity of cells.
- **Metaplasia** is a change in the phenotype of cells.
- **Dysplasia** is characterized by deranged cell growth of a specific tissue that results in cells that vary in size, shape, and organization

Adaptations

Normal

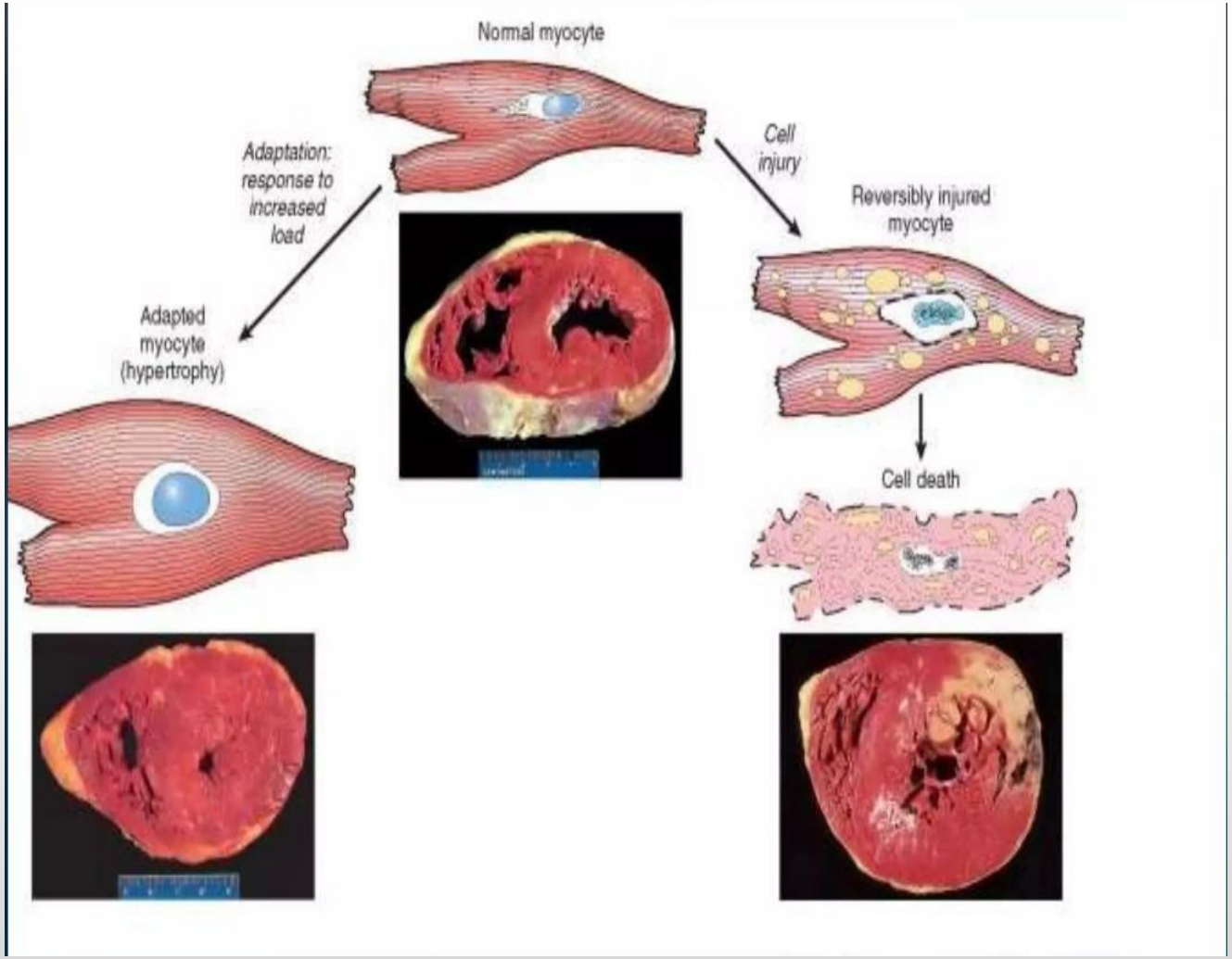




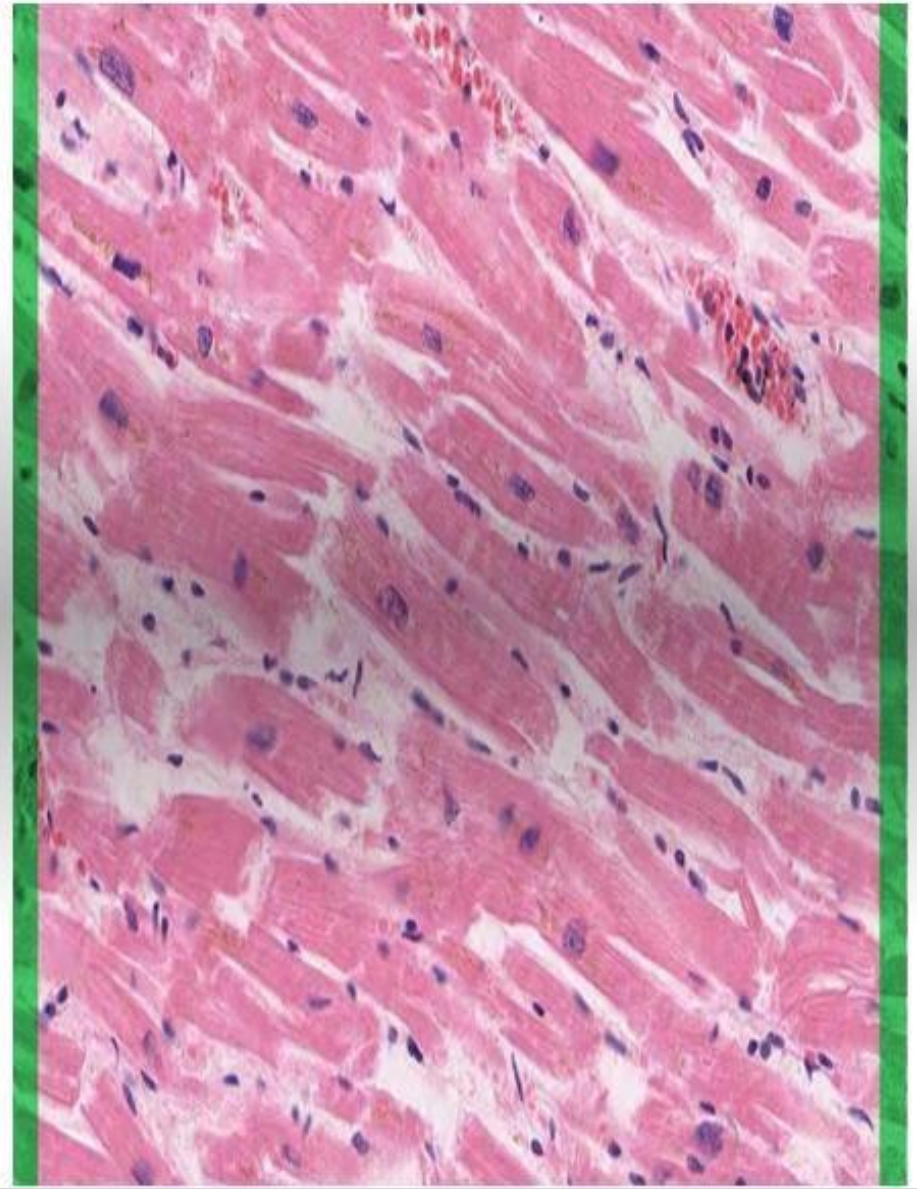
Dysplasia

Hypertrophic cardiomyocyte

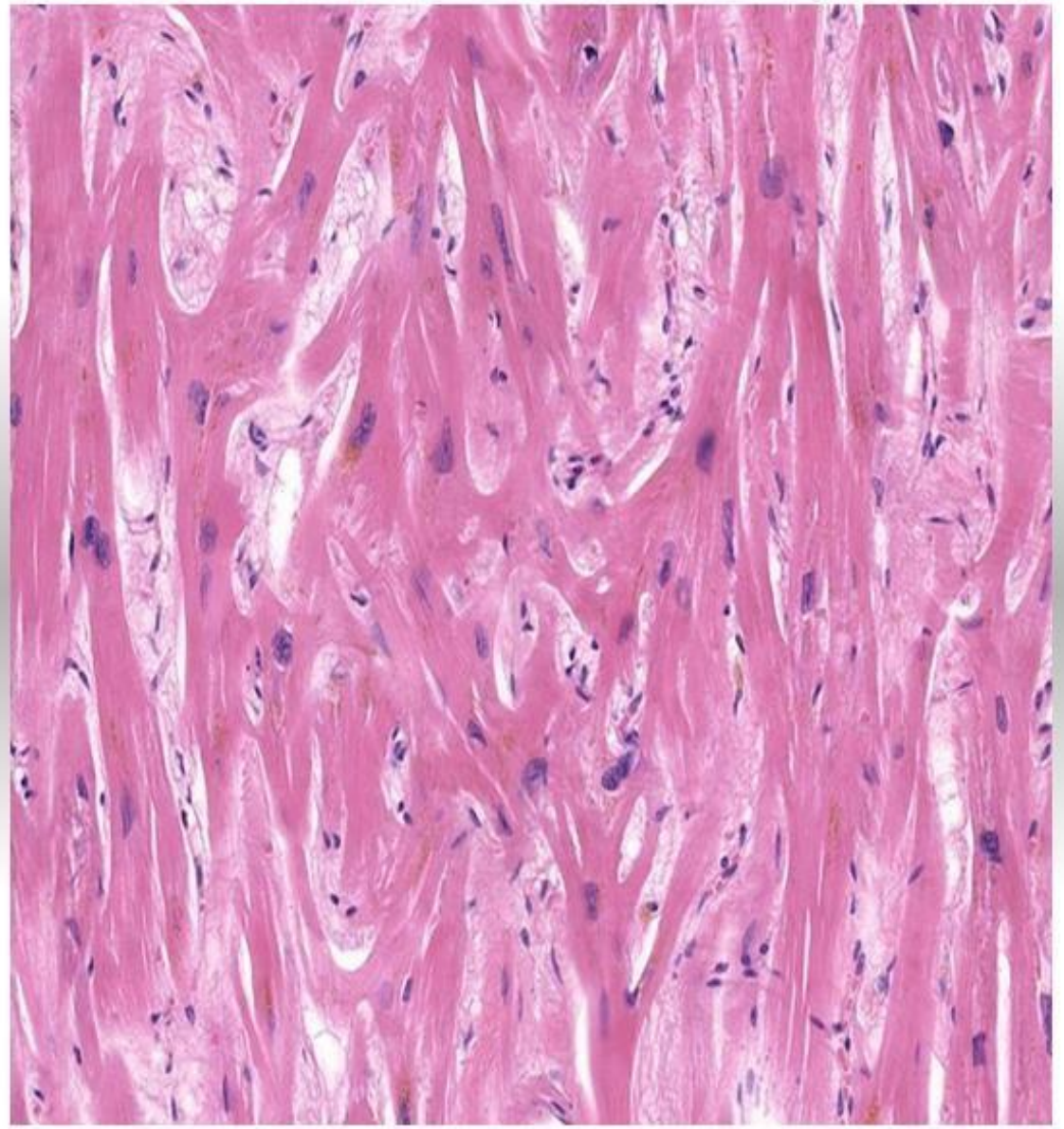
Hypertrophy was diagnosed if myocytes consistently had enlarged and hyperchromatic nuclei, and cell diameters >20 μm, or greater than the diameters of 3 red blood cells (RBCs).



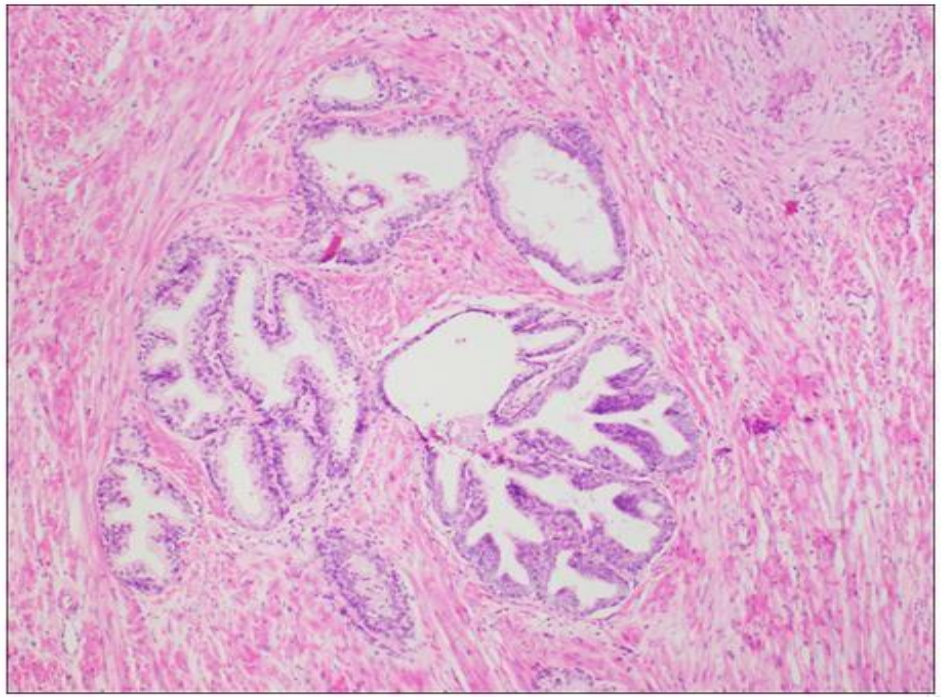
Normal cardiomyocyte



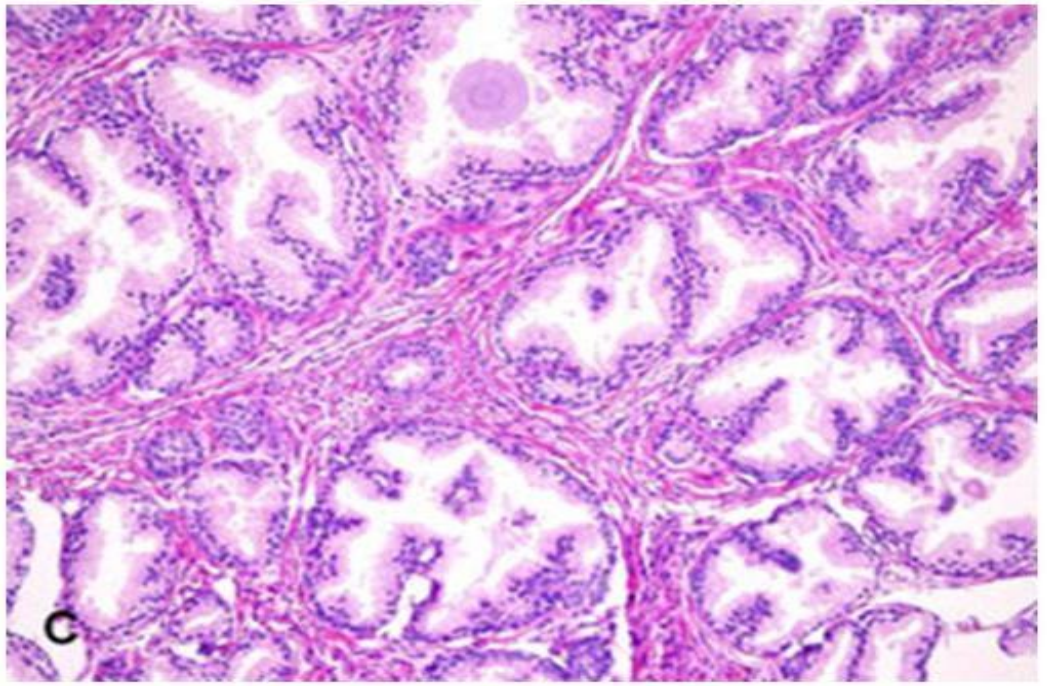
Hypertrophic cardiomyocyte



Normal prostatic tissue



Hyperplasia of prostatic tissue



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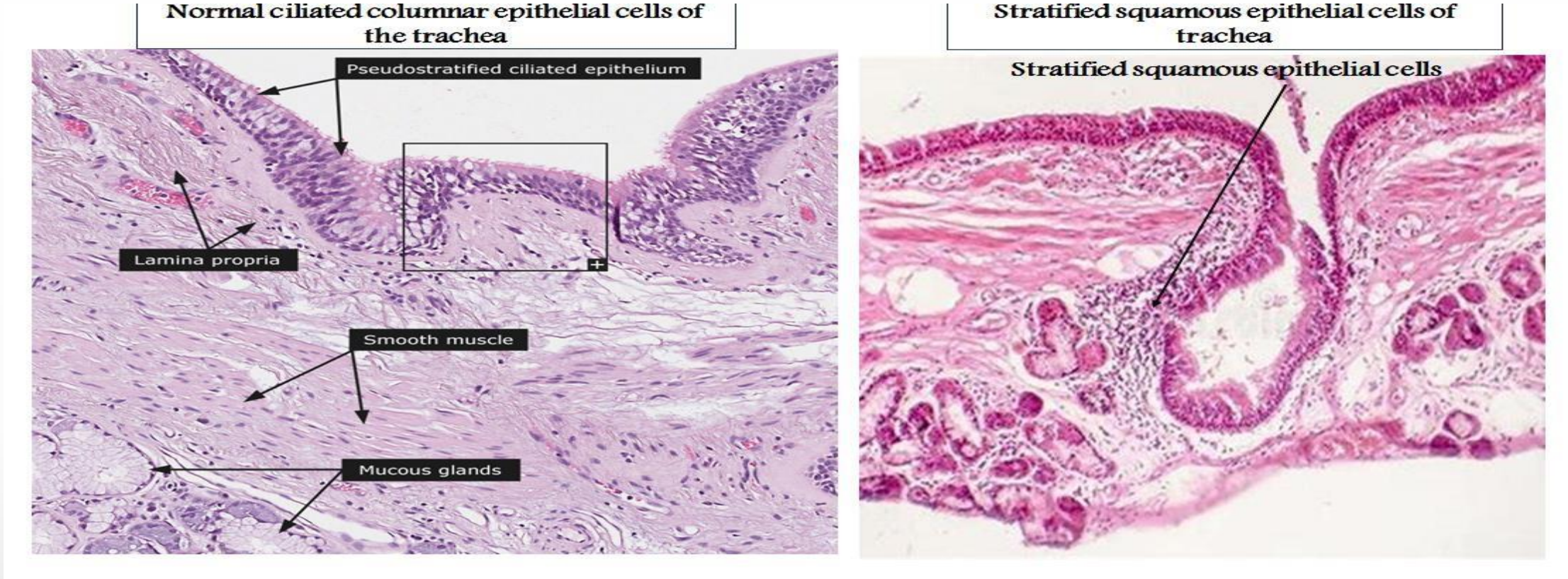
In hyperplasia, there is an increase in the number of cells in an organ or tissue that appear normal under a microscope

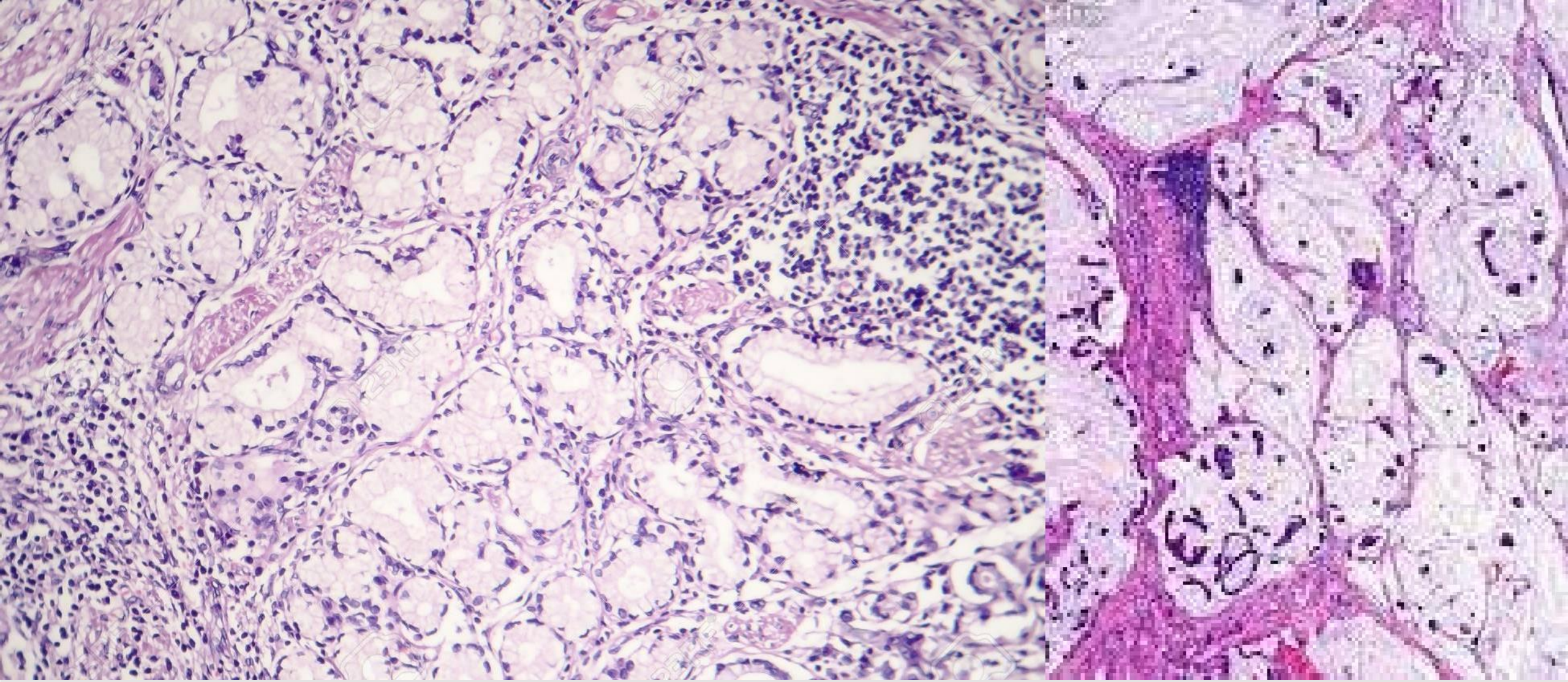


Microscopic appearance: **Metaplastic epithelium** is visible on microscopy as the area between the normal columnar epithelium proximally and the original squamous epithelium distally.

Basic Organization of the Gastrointestinal Tract

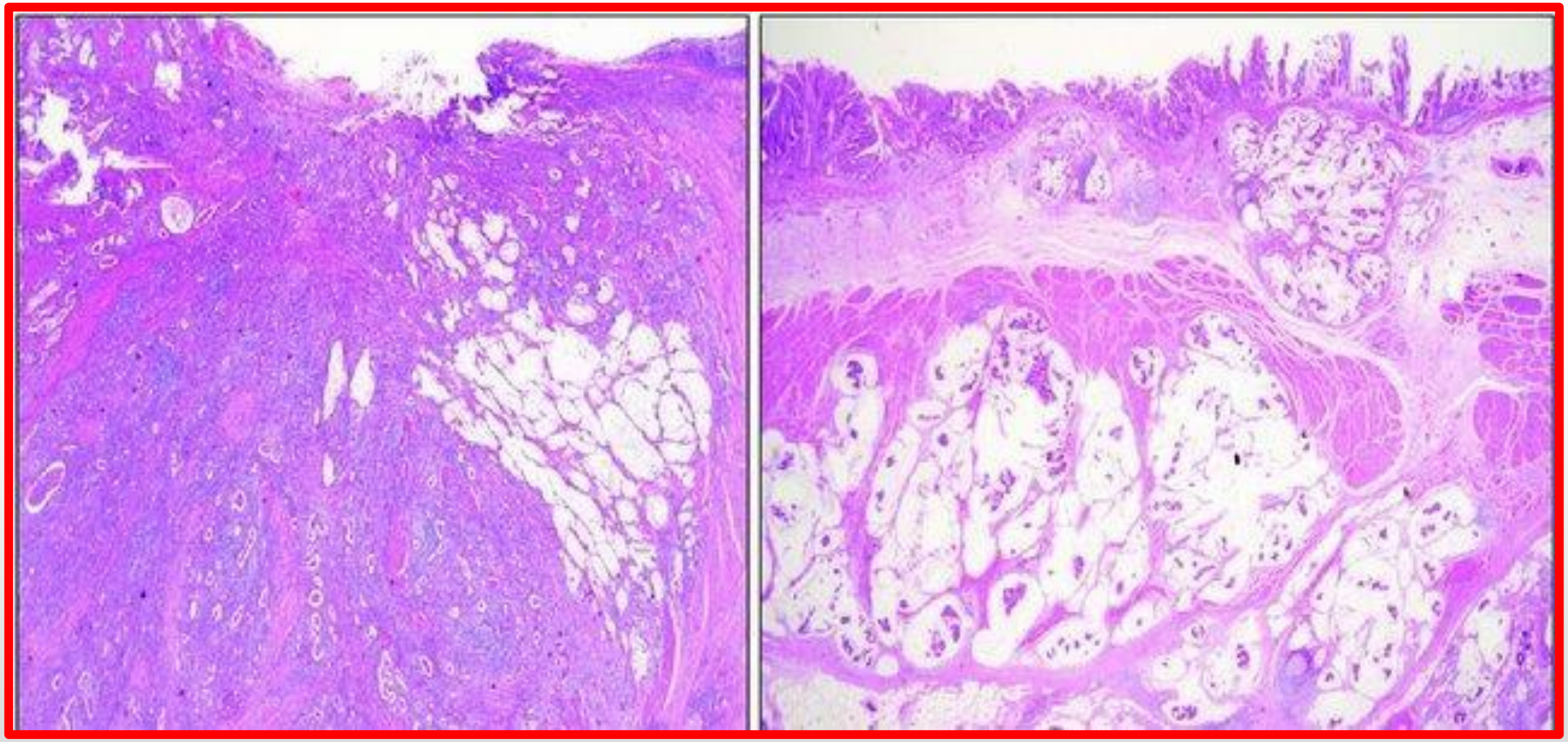
The GI tract is a muscular tube lined by a mucous membrane and features a basic histological organization:

- The mucosa surrounds the lumen of the GI tract and consists of an **epithelial cell layer**, **lamina propria**, **muscularis mucosa**.
- The submucosa is a thick connective tissue layer that contains arteries, veins, lymphatics, and nerves.
- The muscularis externa surrounds the submucosa (the inner circular layer and outer longitudinal layer).
- The adventitia consists of connective tissue containing blood vessels, nerves, and fat.



Mucinous adenocarcinoma of the stomach.
Clusters and scattered tumor cells floating in the abundant extracellular mucin pools

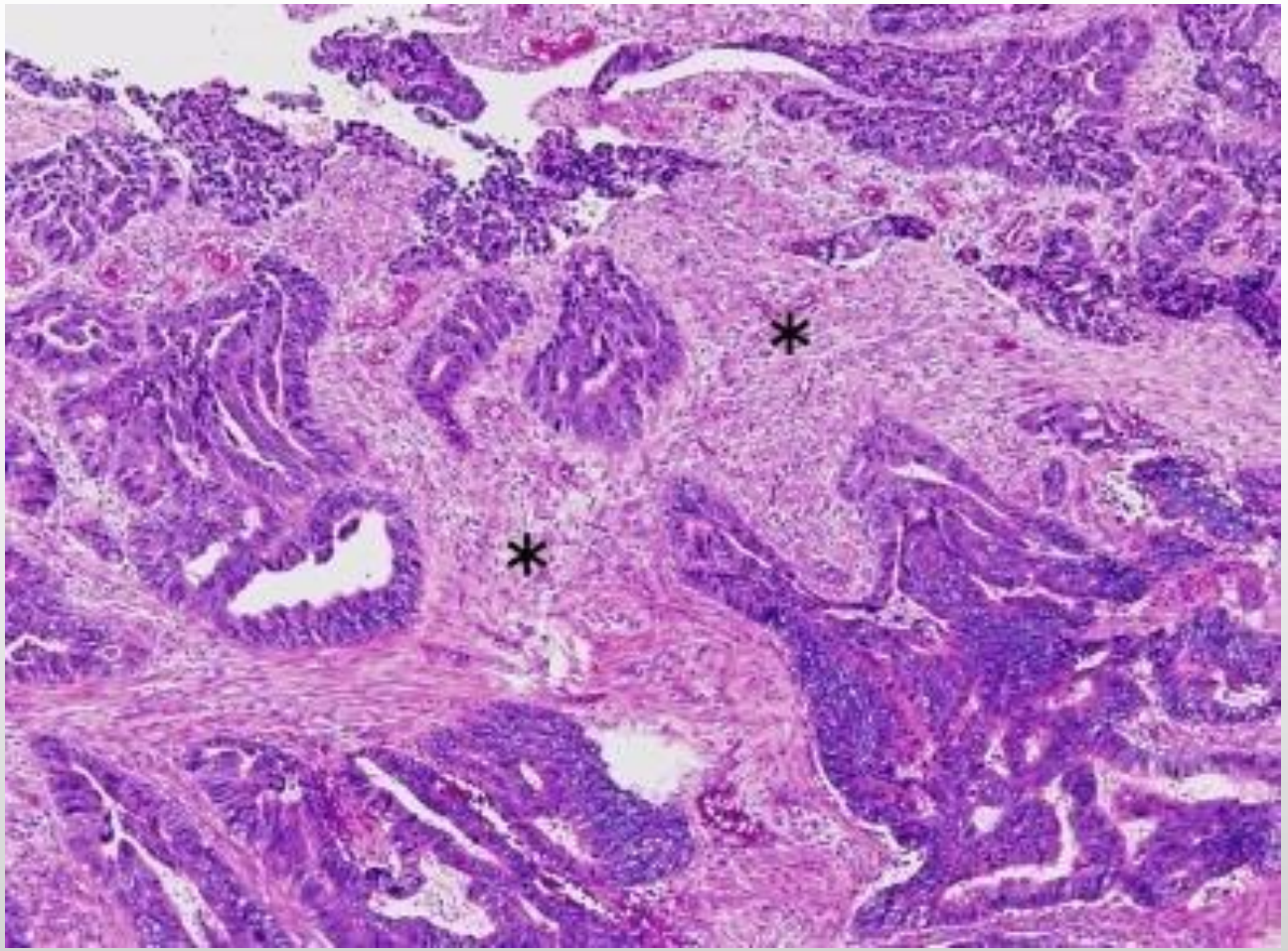
Mucinous carcinoma of the stomach



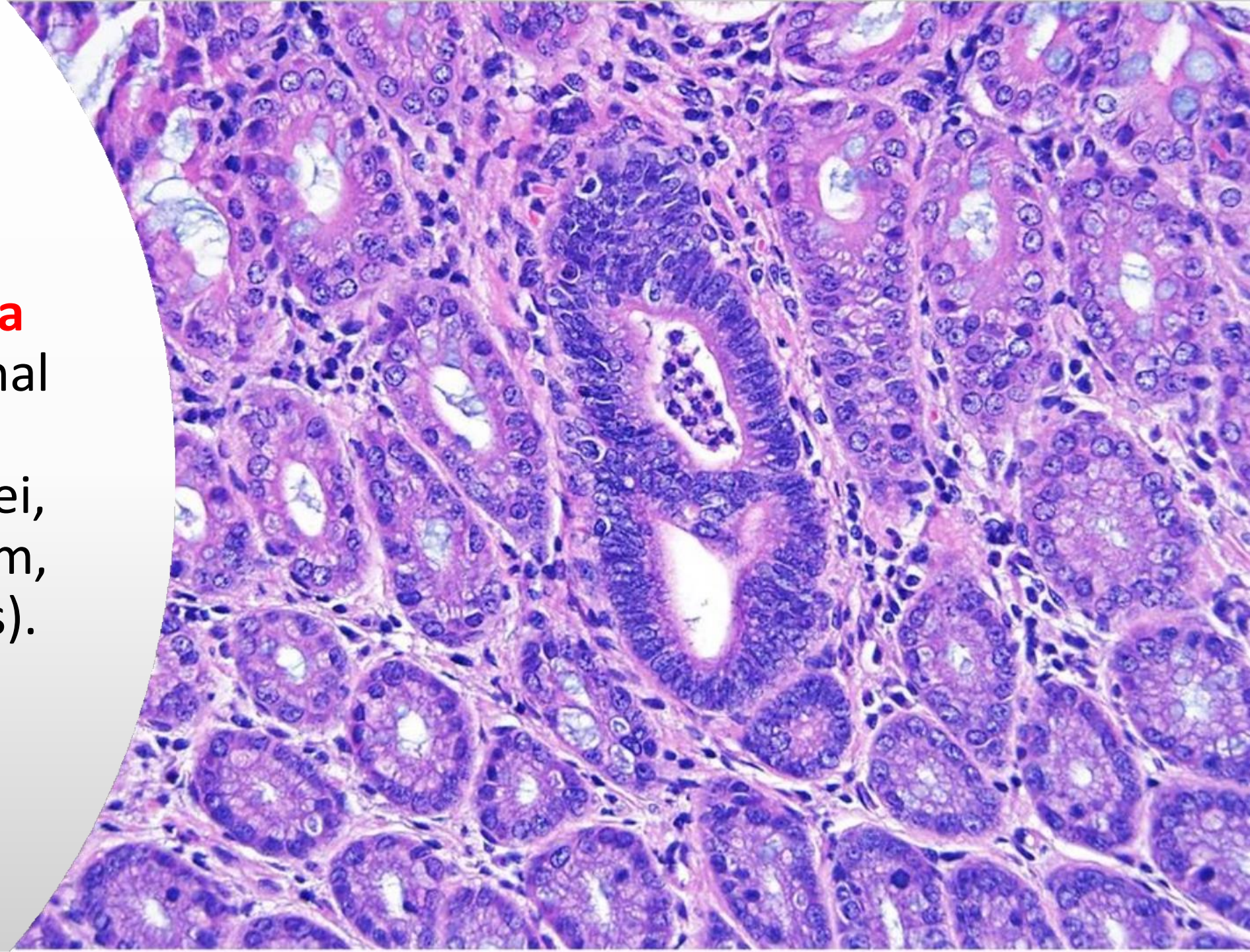
Extracellular-mucin-pools

colon adenocarcinoma

(nuclear pleomorphism and hyperchromasia)

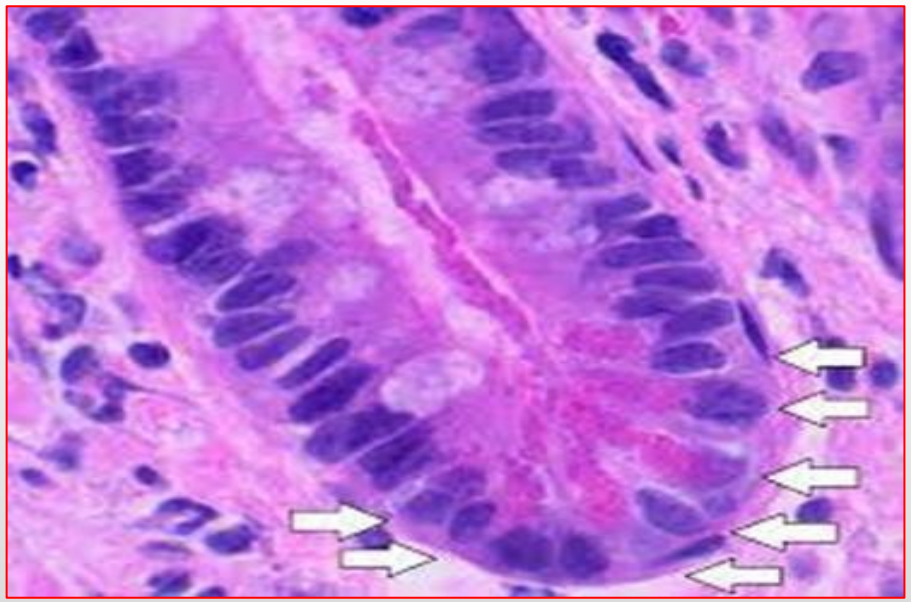


- **Colonic adenocarcinoma** showing intestinal type features (pencillate nuclei, purple cytoplasm, rounded glands).



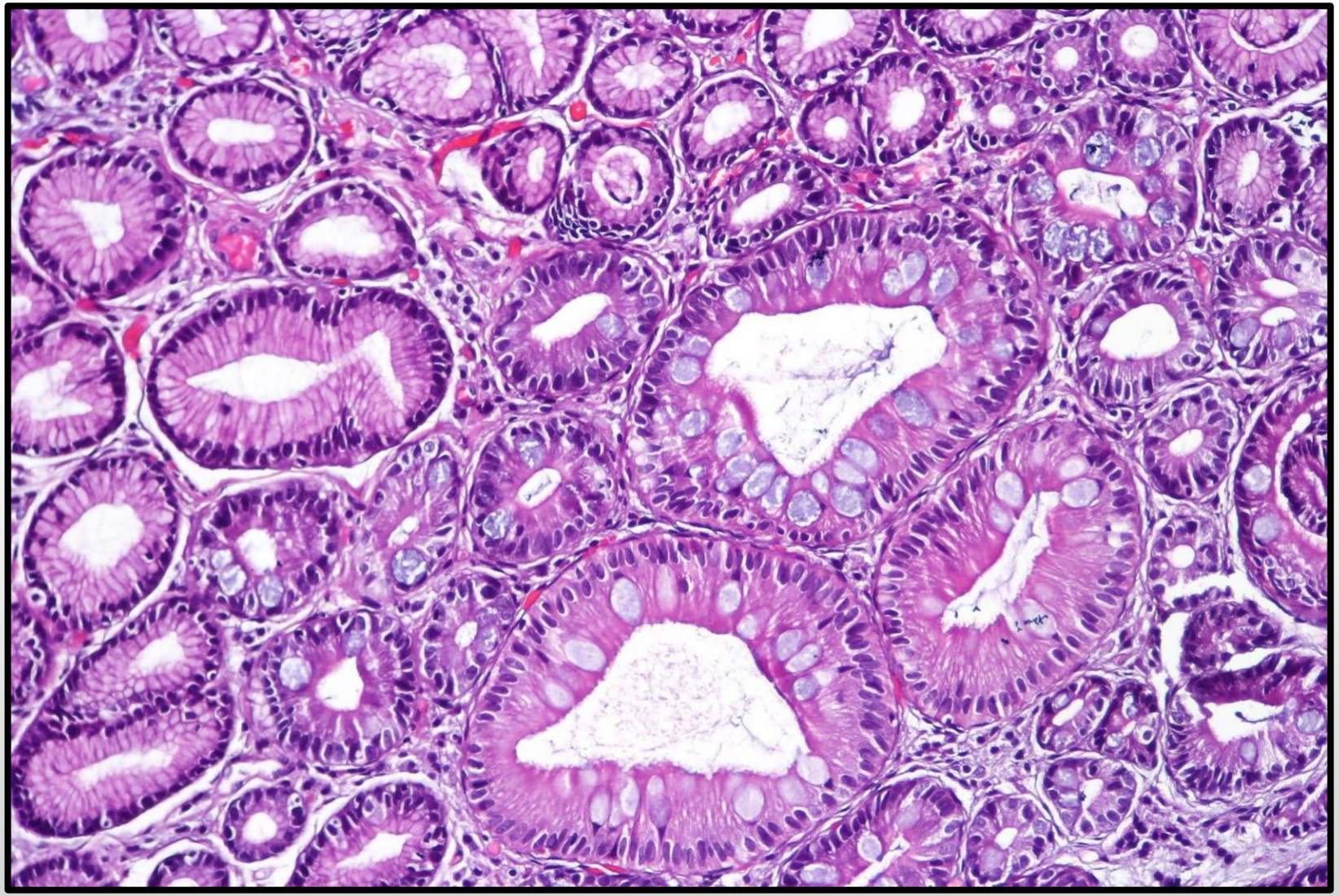
Intestinal metaplasia is characterized by morphological similarity to the enterocytes, Paneth cells, and goblet cells; it shows characteristics of absorbing mucosa, the presence of a striated border, and brush border structures.

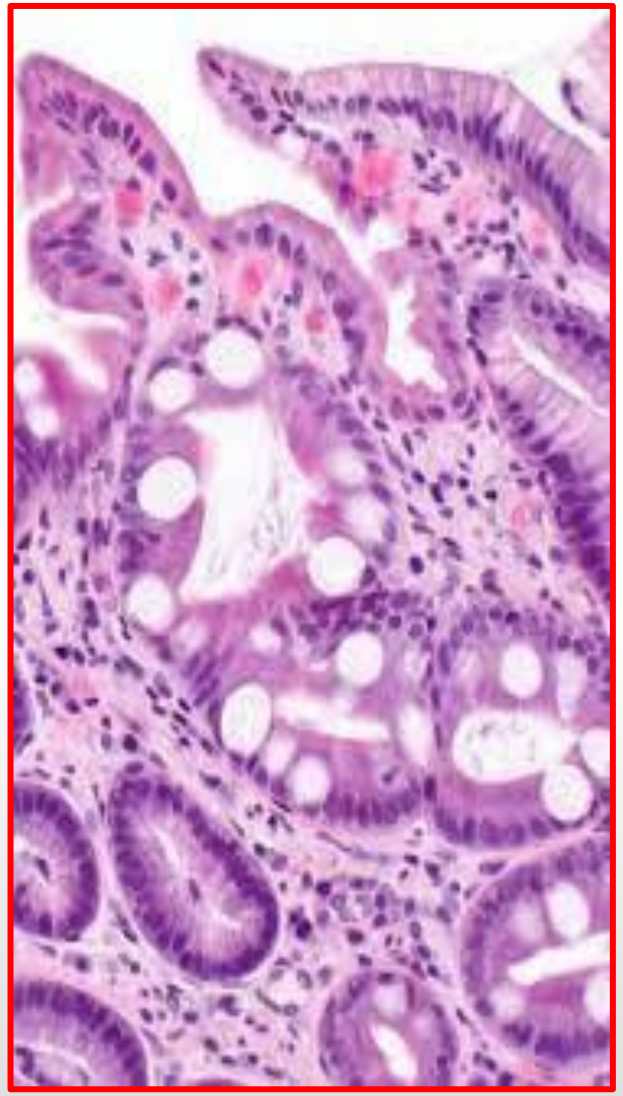
Goblet cells



Paneth cells

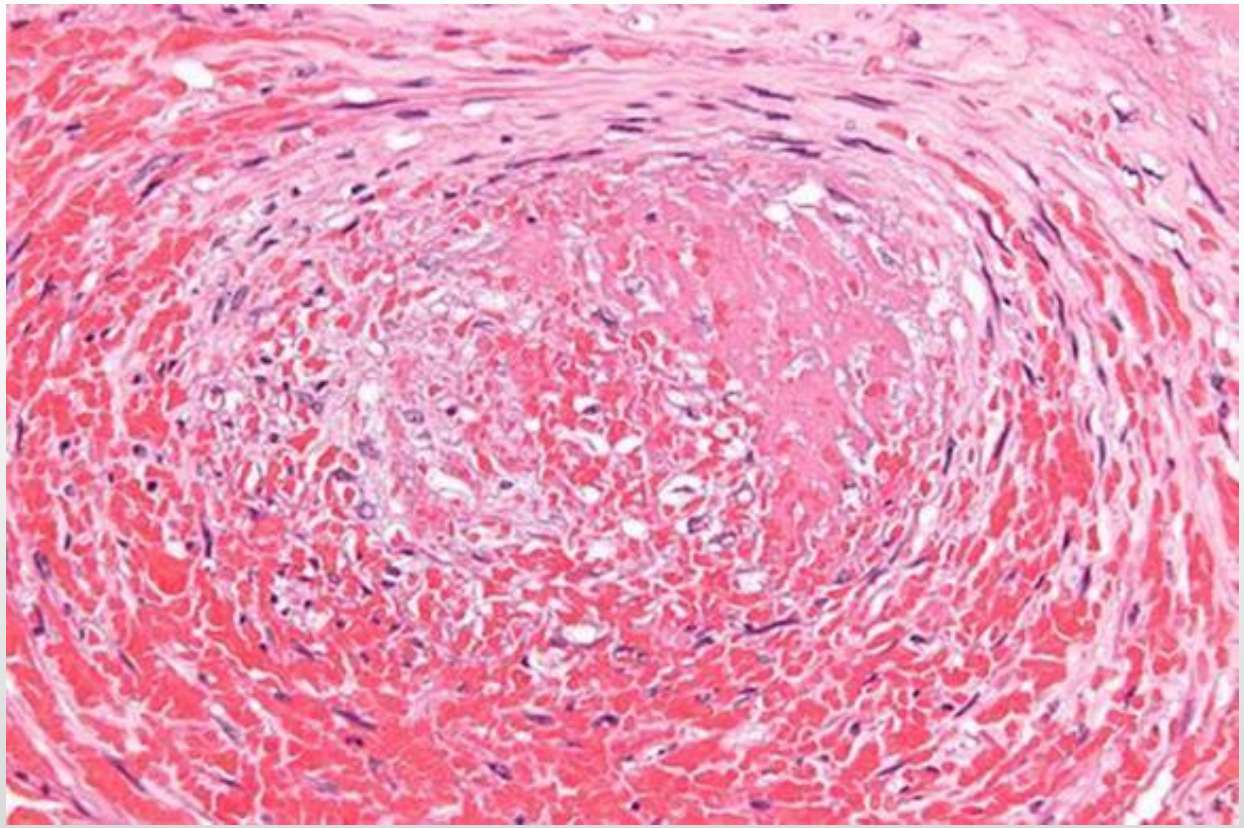
Intestinal metaplasia

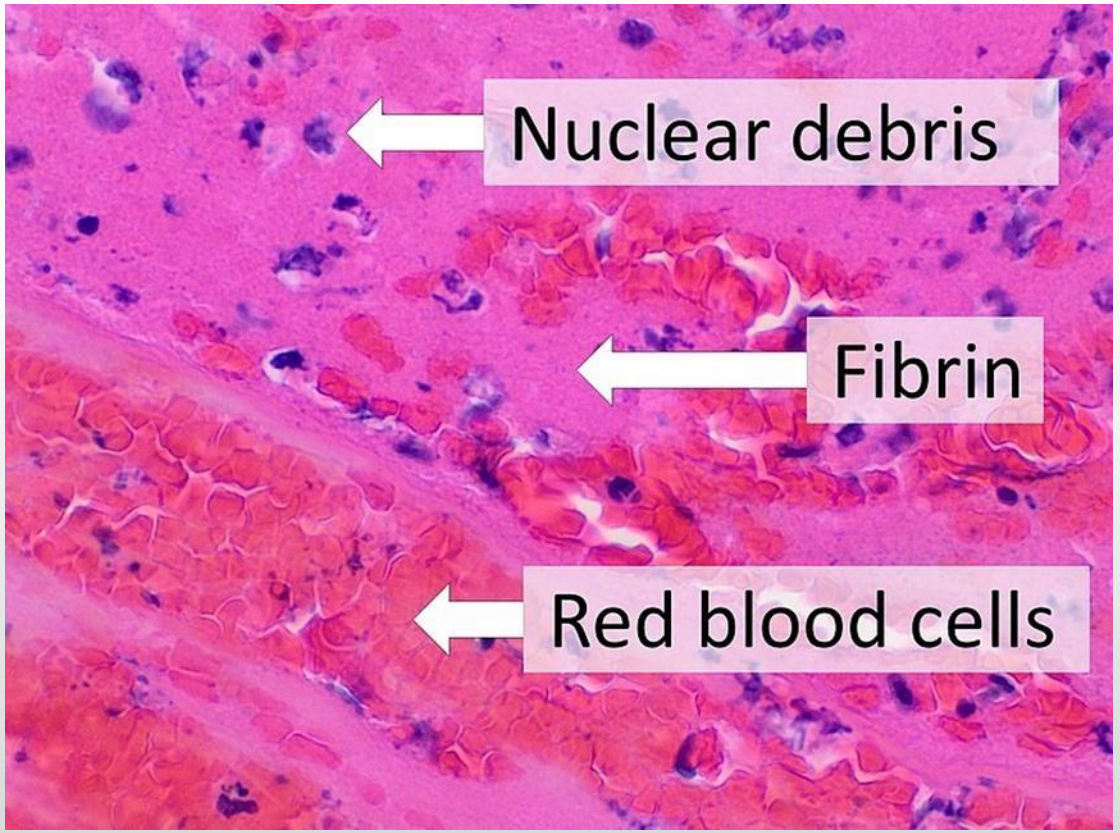




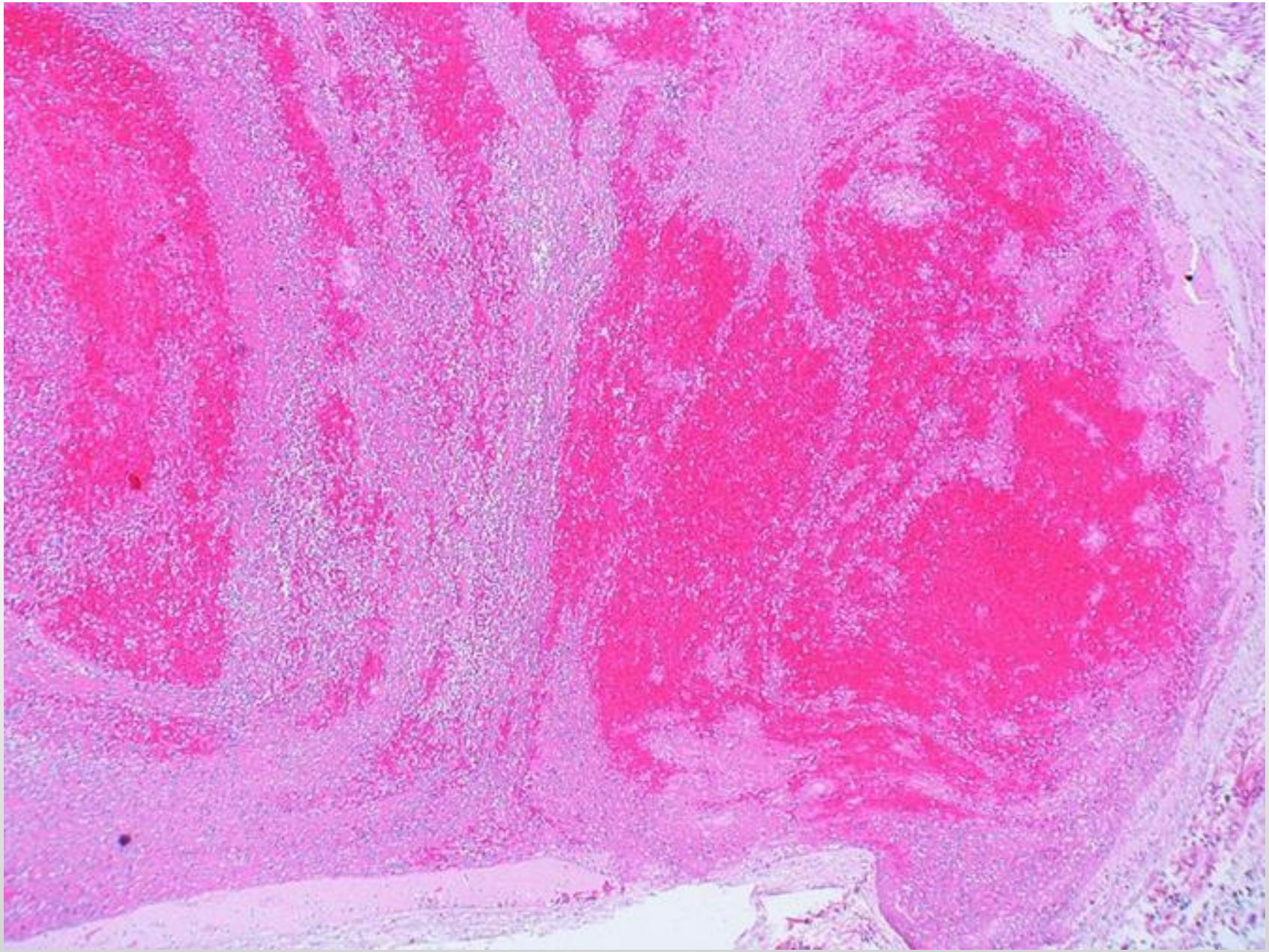
Thrombus

Composition of a fresh thrombus at microscopy, showing nuclear debris in a background of fibrin and red blood cells.





Thrombus microscopic picture may have layers, with lighter layers of platelets and fibrin, and darker layers of red blood cells.

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