

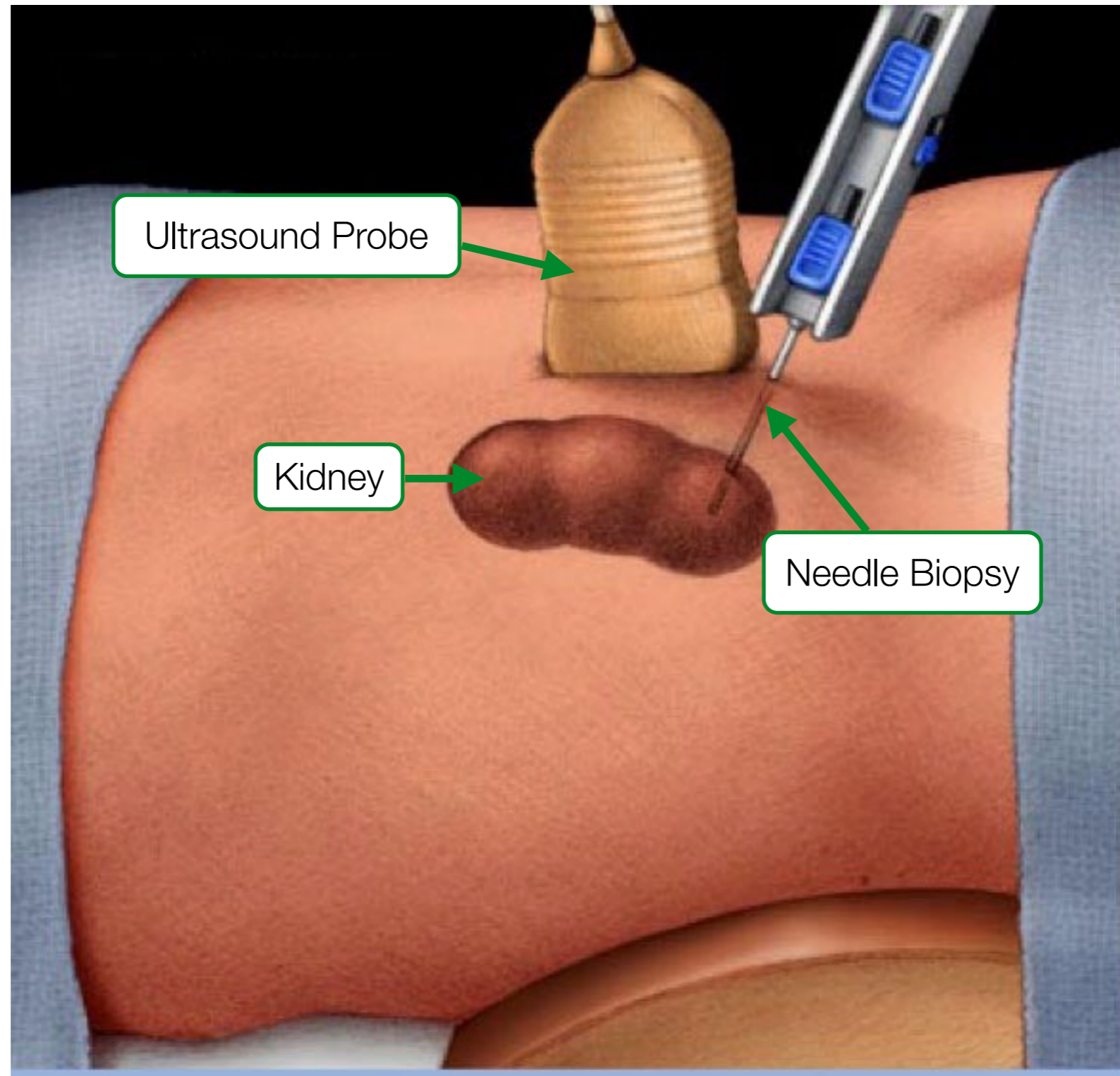
Histological Features of Cells and Identifying Epithelia

What we'll talk about...

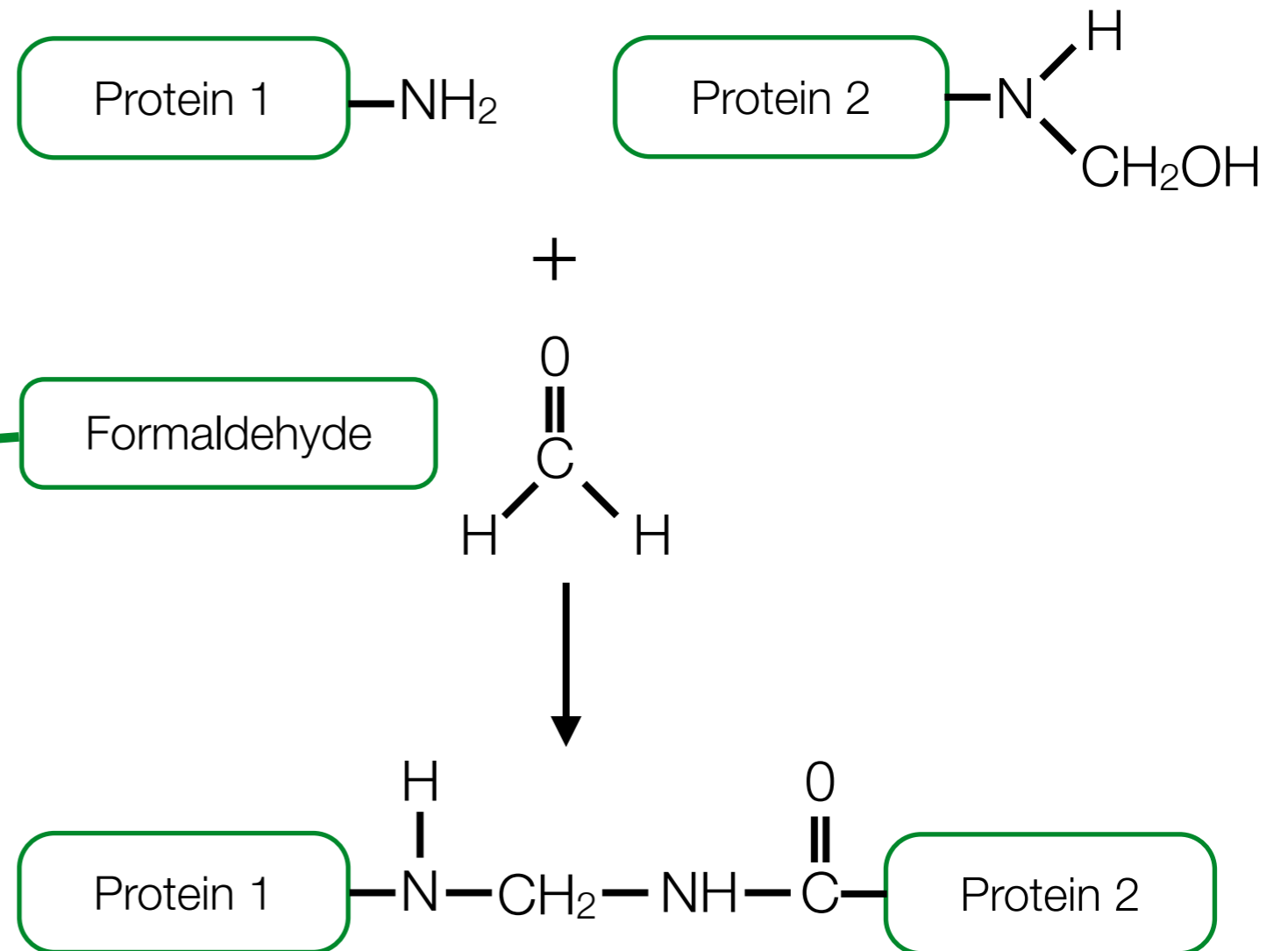
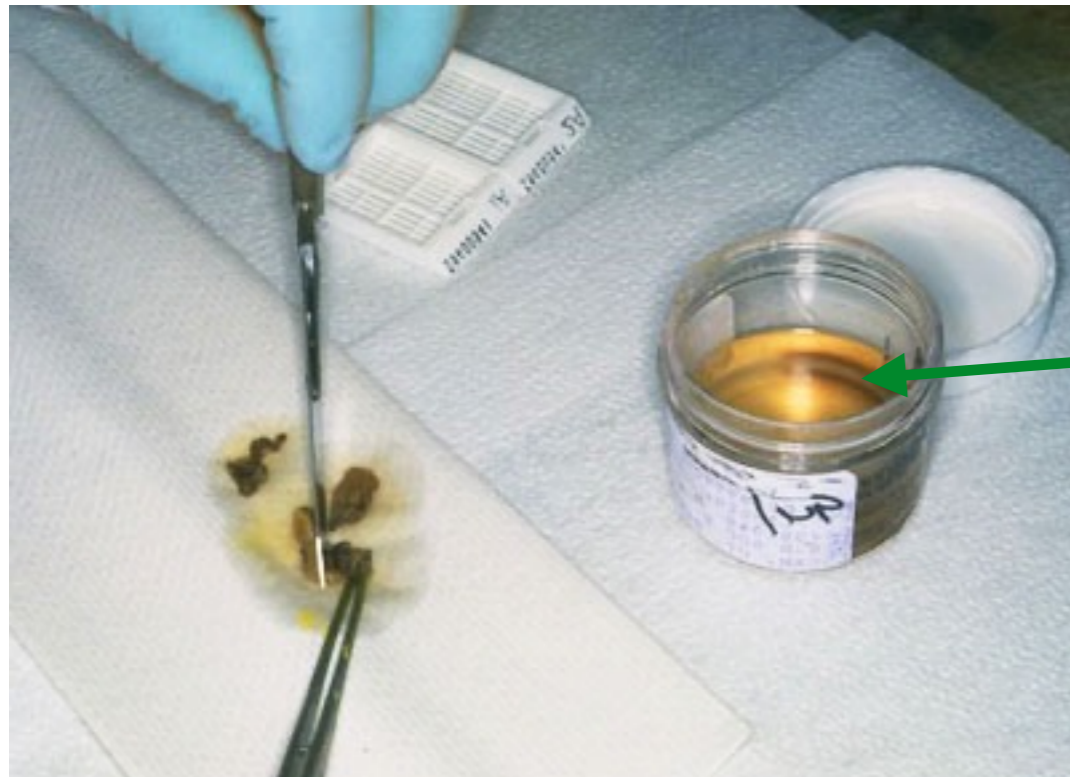
- Preparation of samples for histological analysis
- Identifying key cellular features and structures
- Classification of epithelia
- Identifying features of epithelia

Preparation of samples

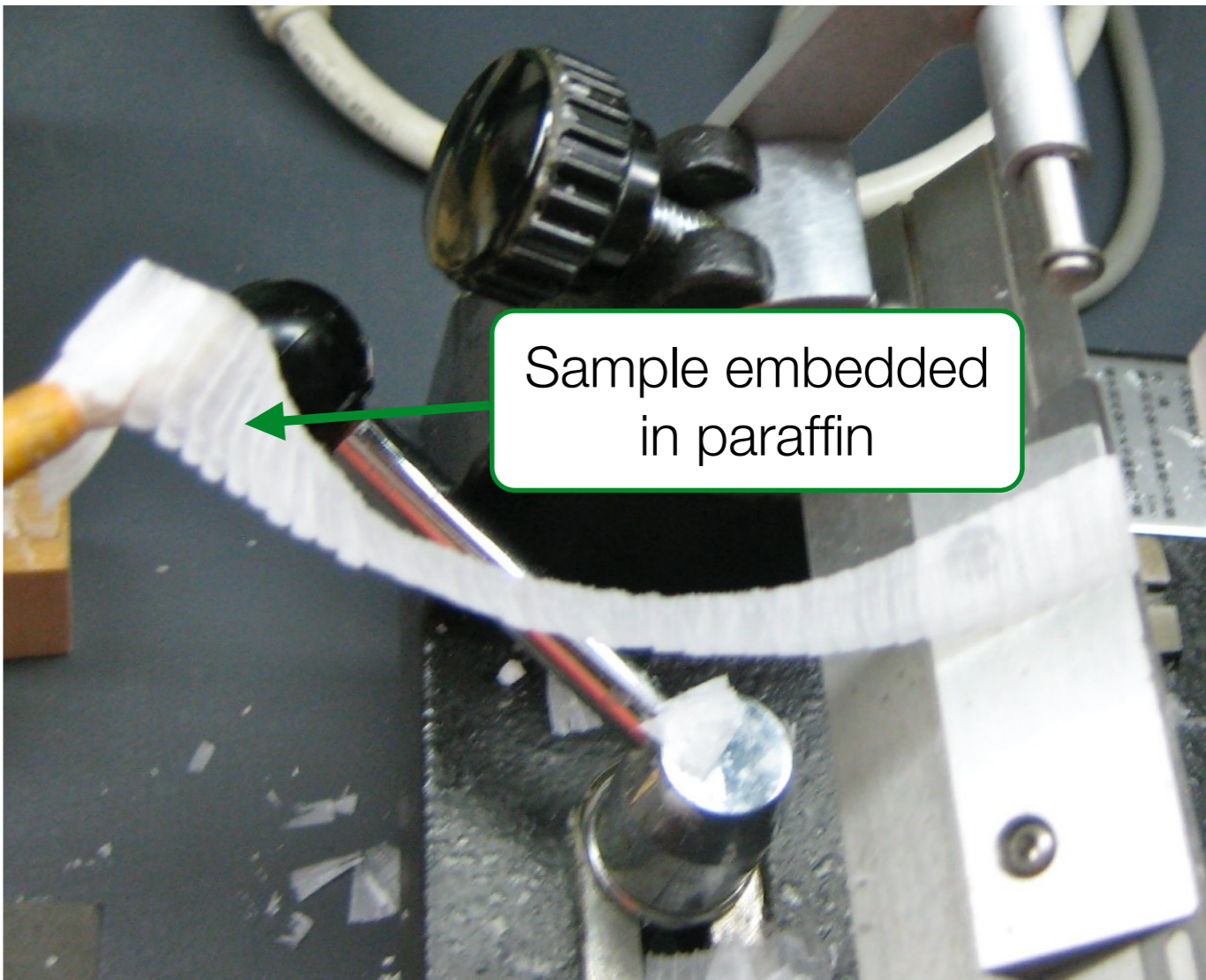
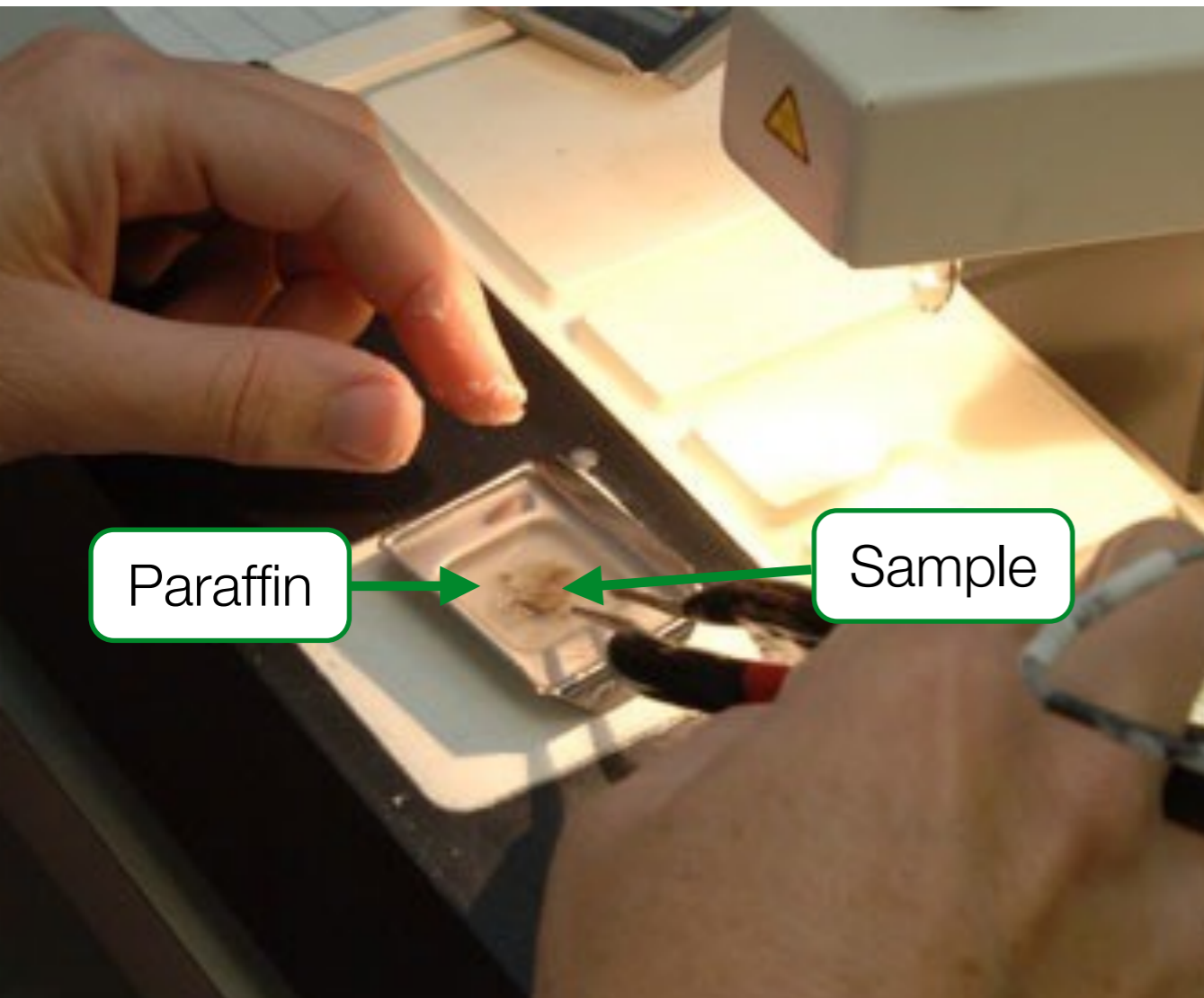
Samples for histological analysis are often obtained by biopsy.



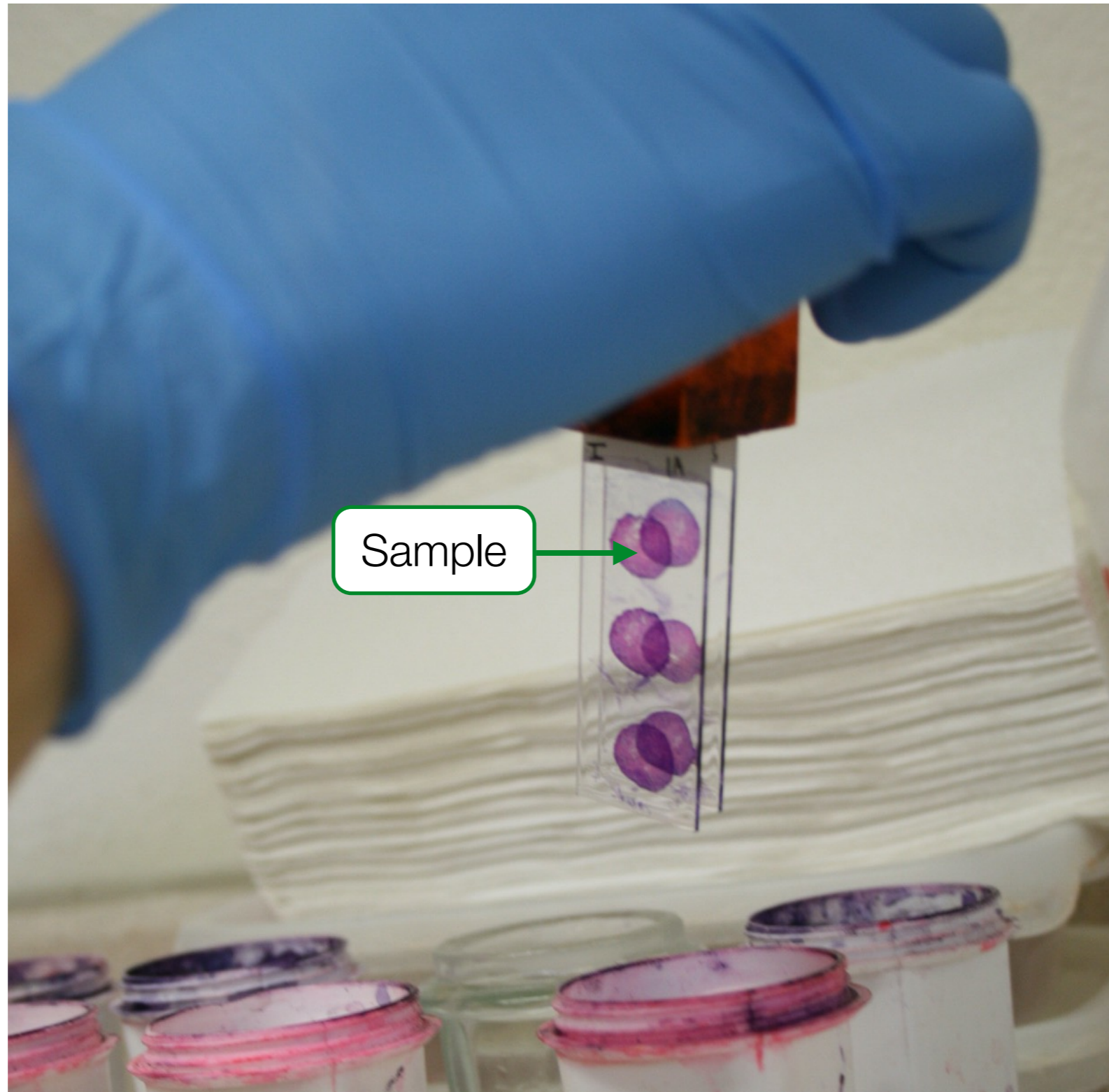
Fixation of sample prevents degradation and preserves structure of cells and tissues.



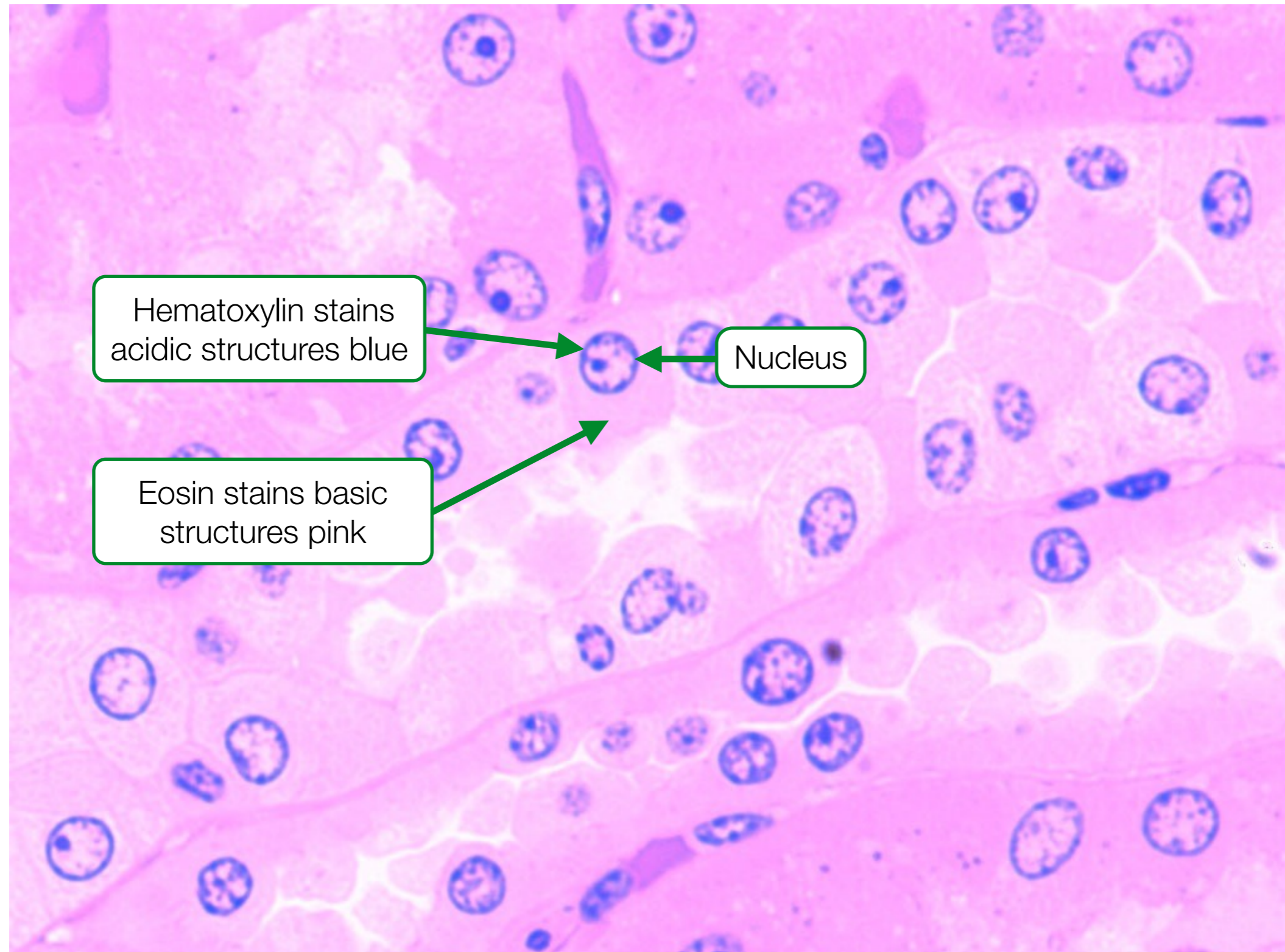
Tissue sample are embedded in wax and sliced into thin sections.



Samples mounted on slides and then stained with specific dyes.

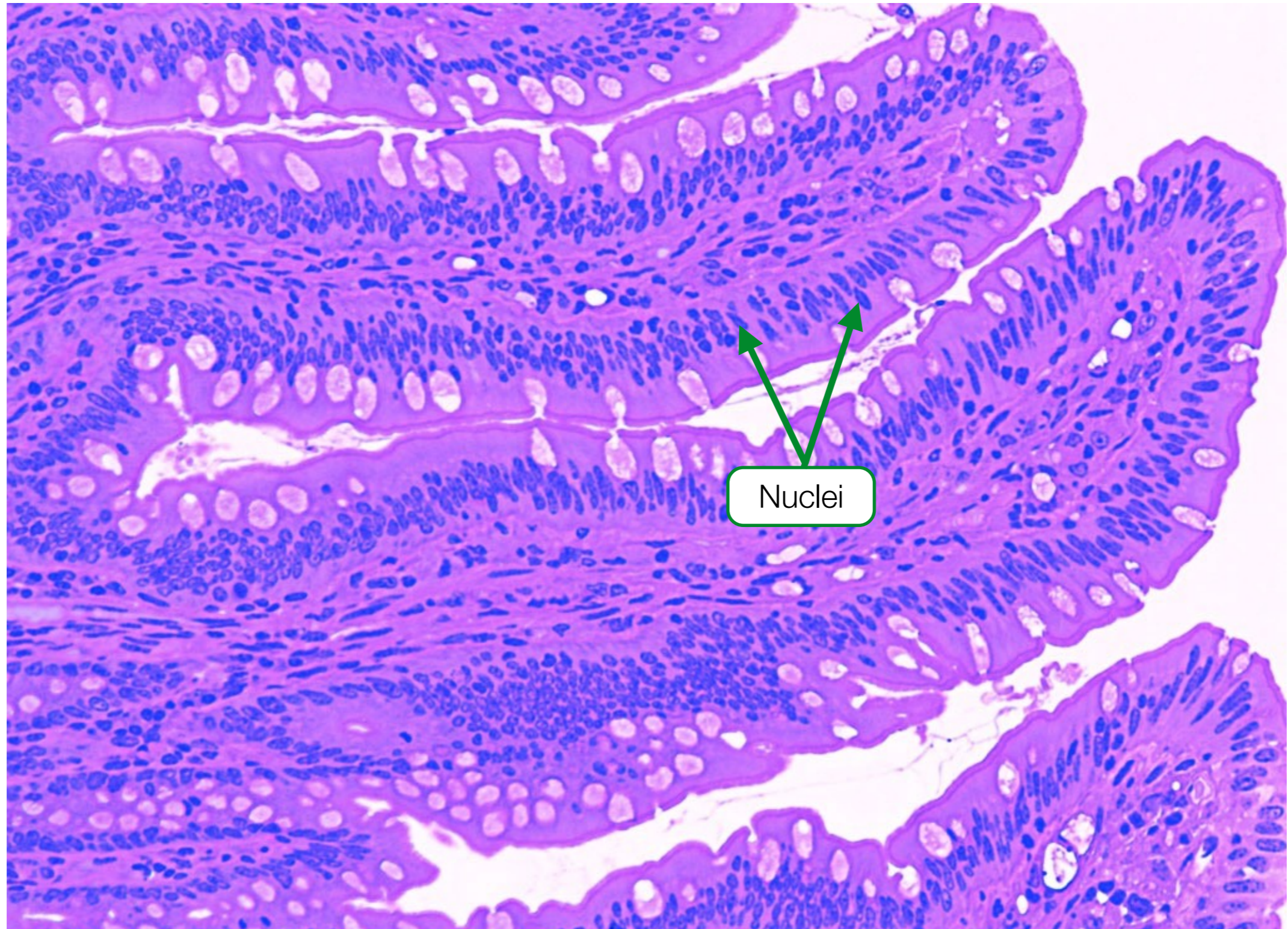


Hematoxylin and eosin are the dyes most commonly used in histology.

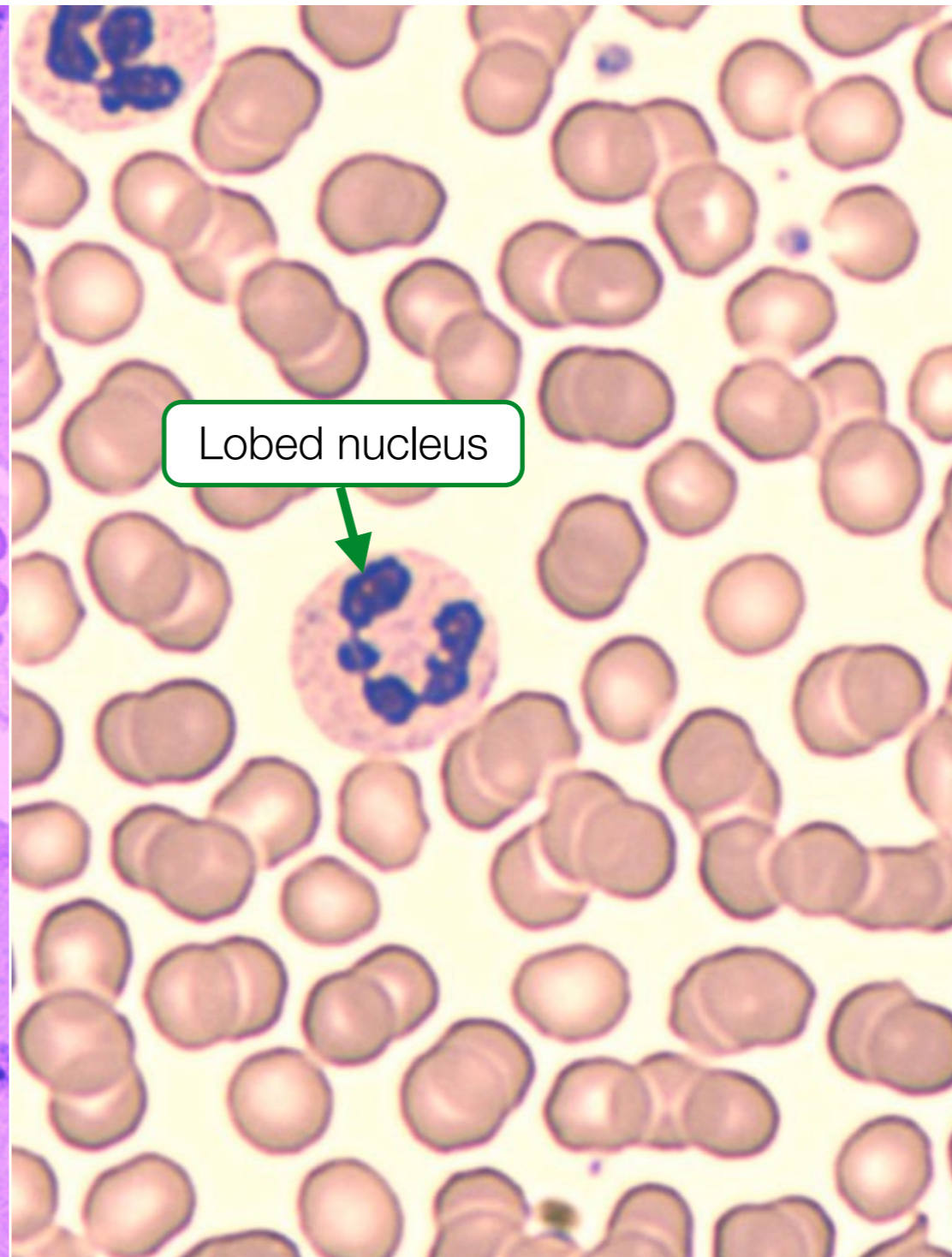
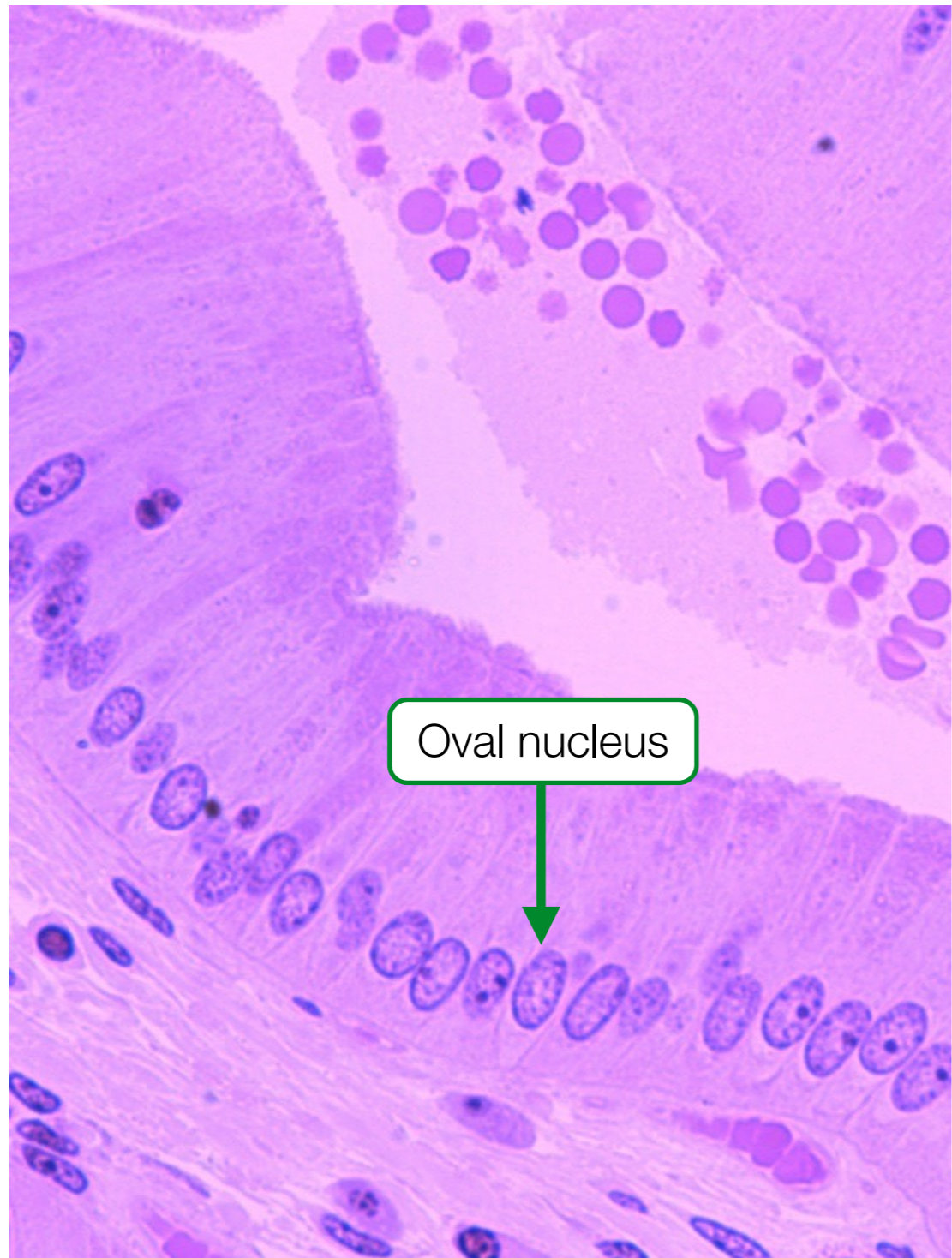


Feature you can see in most histological images

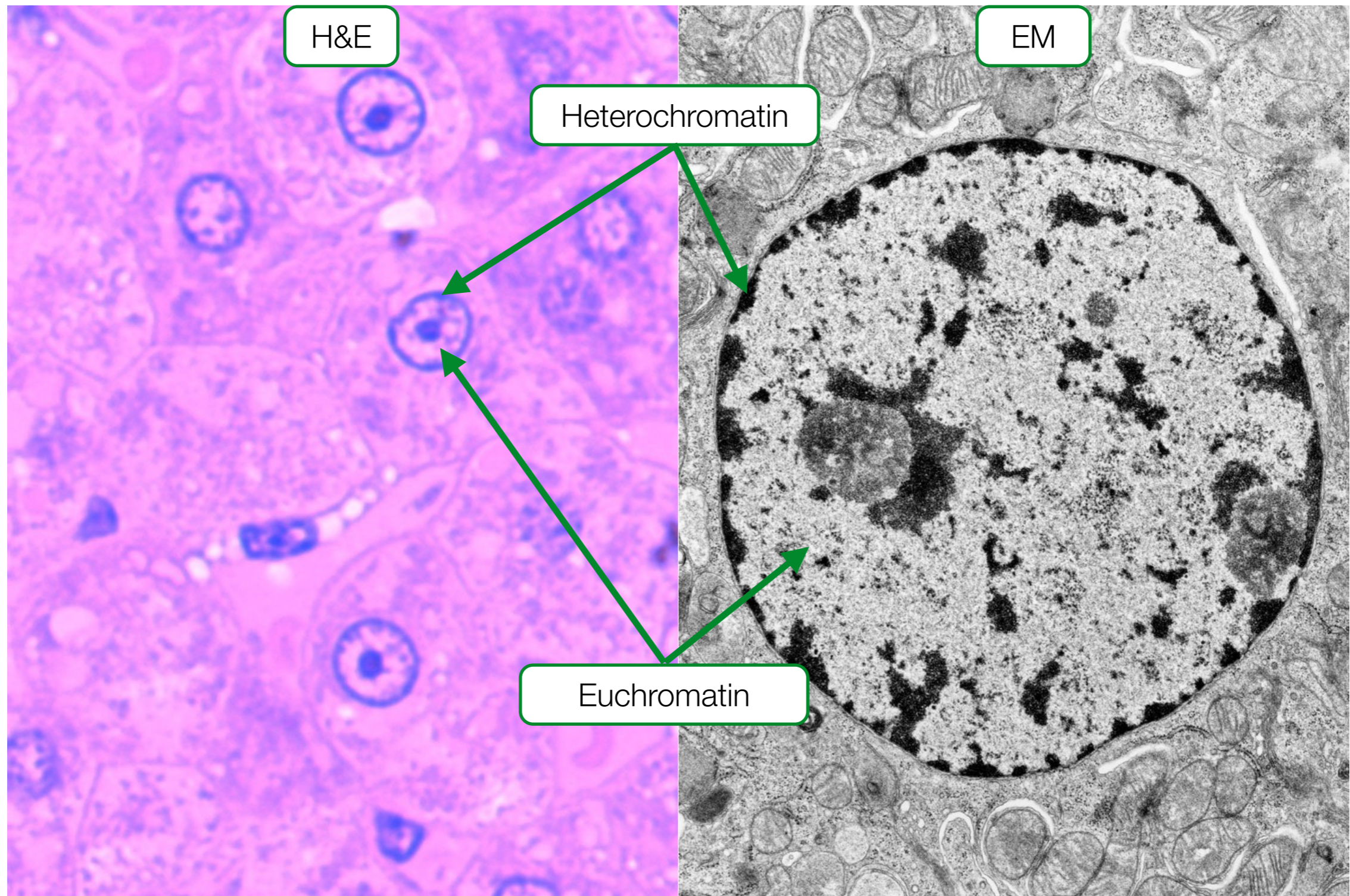
Nuclei are often the most visible and easily recognizable structure.



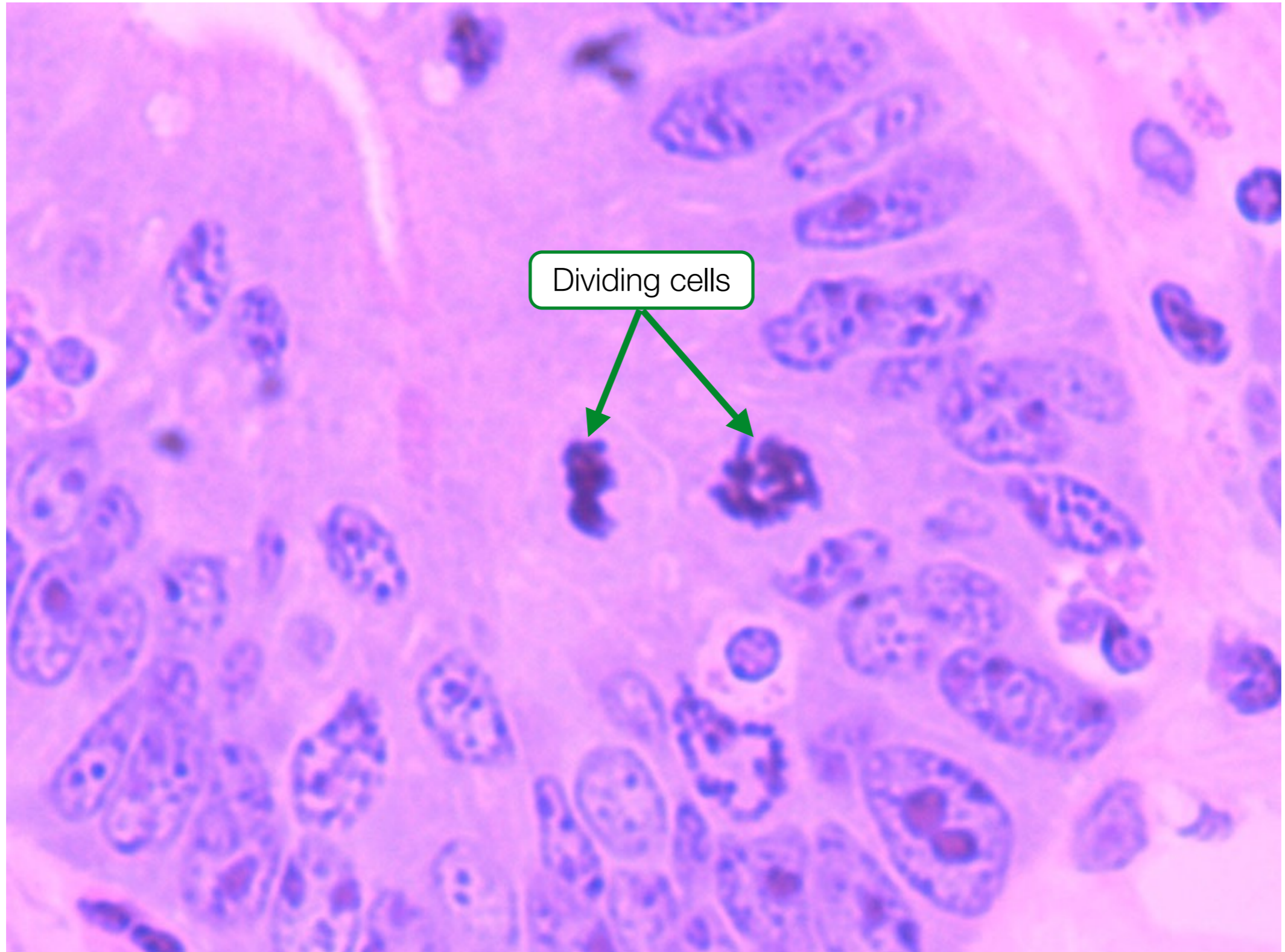
Nuclei can have different shapes and localize to different regions of cells.



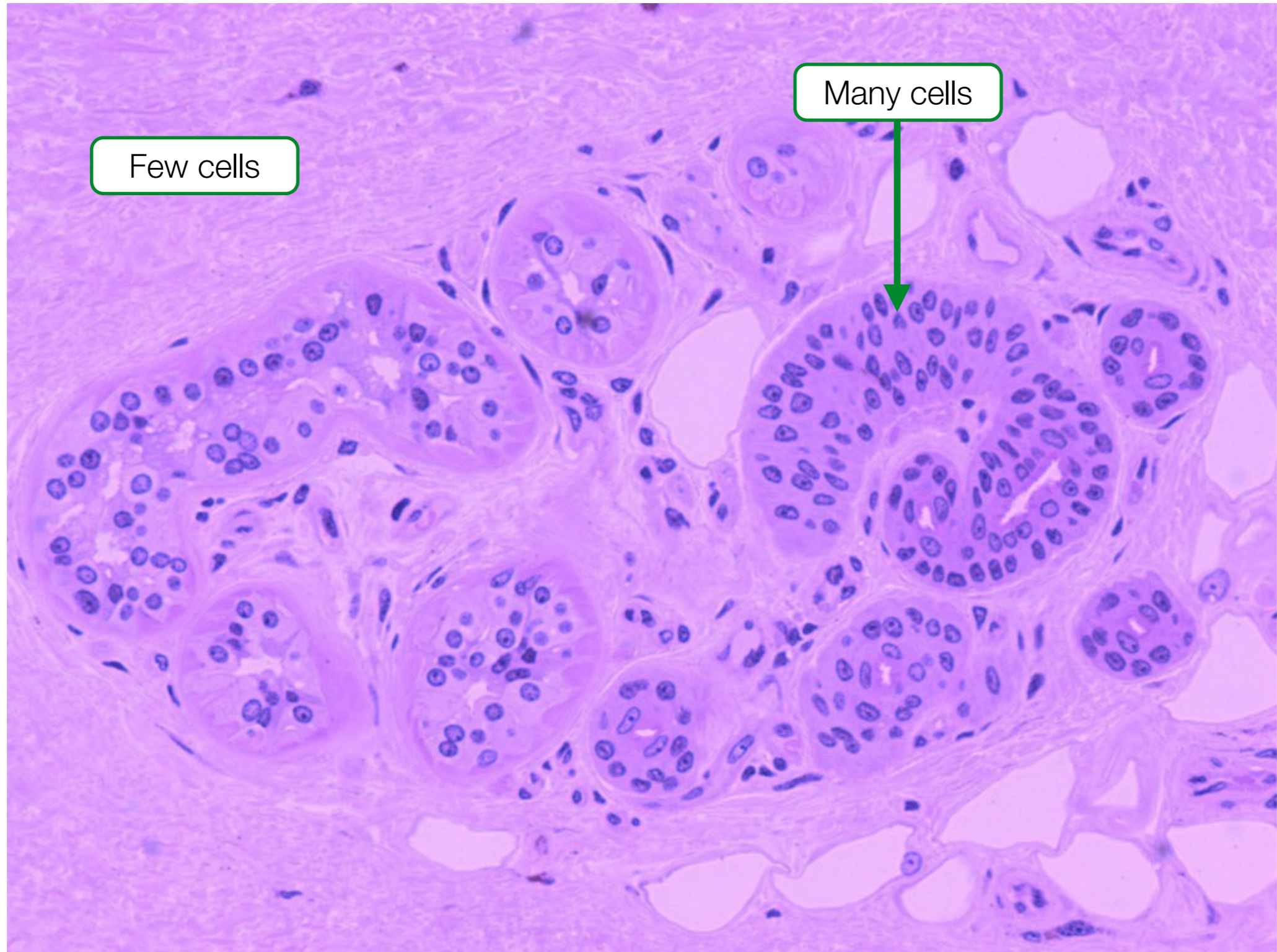
The amount of heterchromatin and euchromatin indicate the transcriptional activity of a cell.



The number of mitotic cells indicates the rate of cell division.

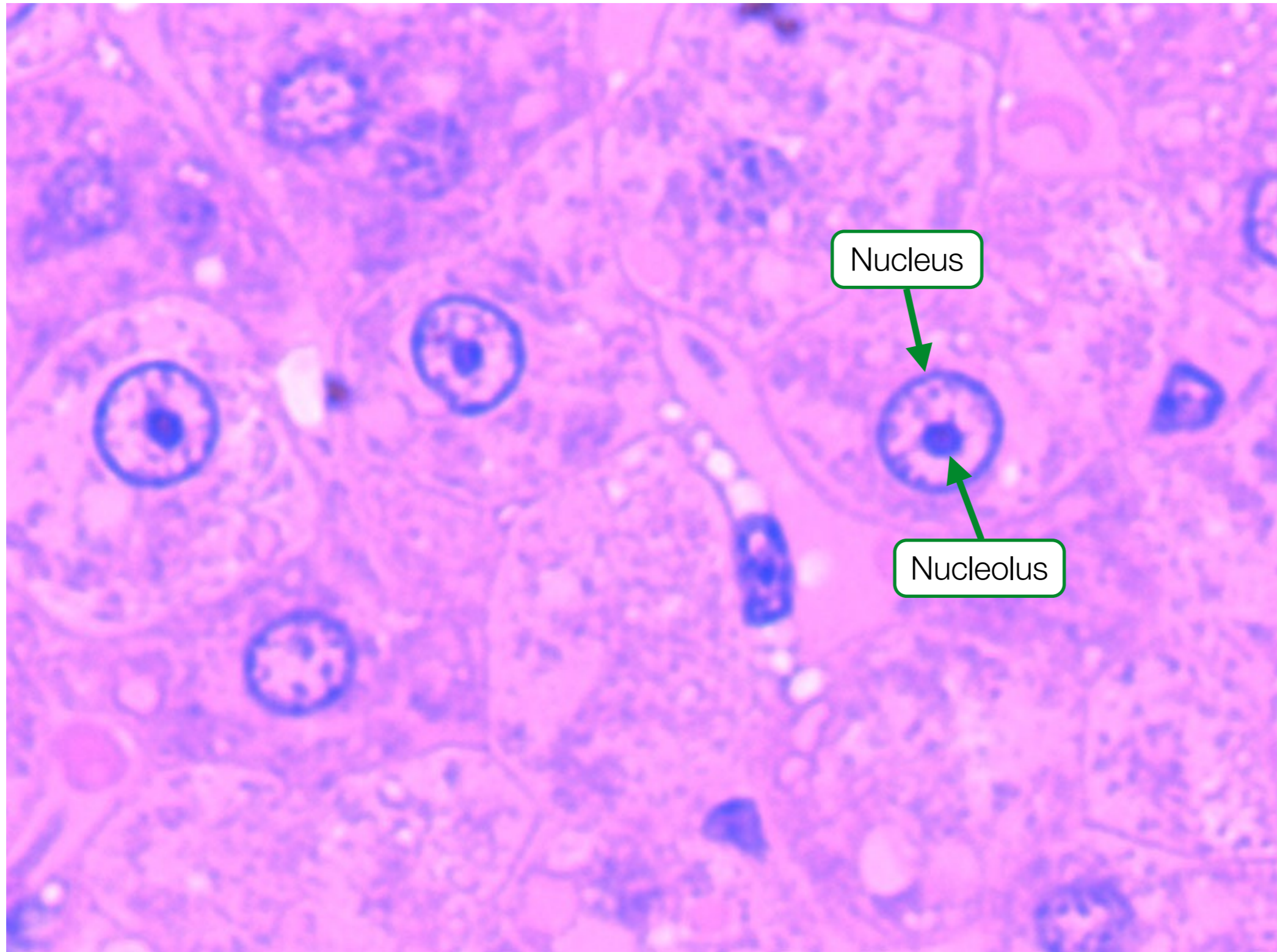


The number of nuclei indicate the density of cells in a tissue.

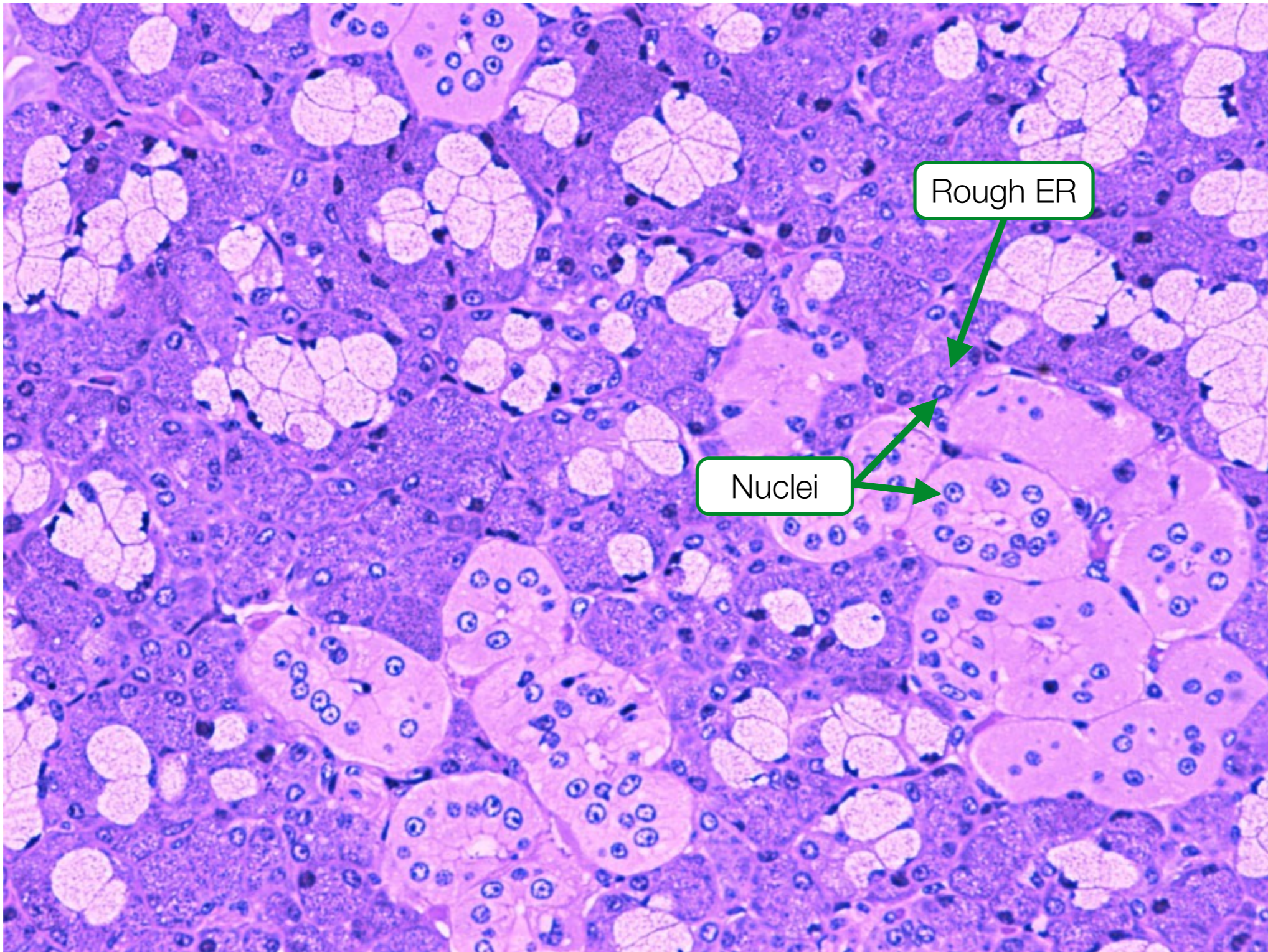


Other organelles visible in histological samples

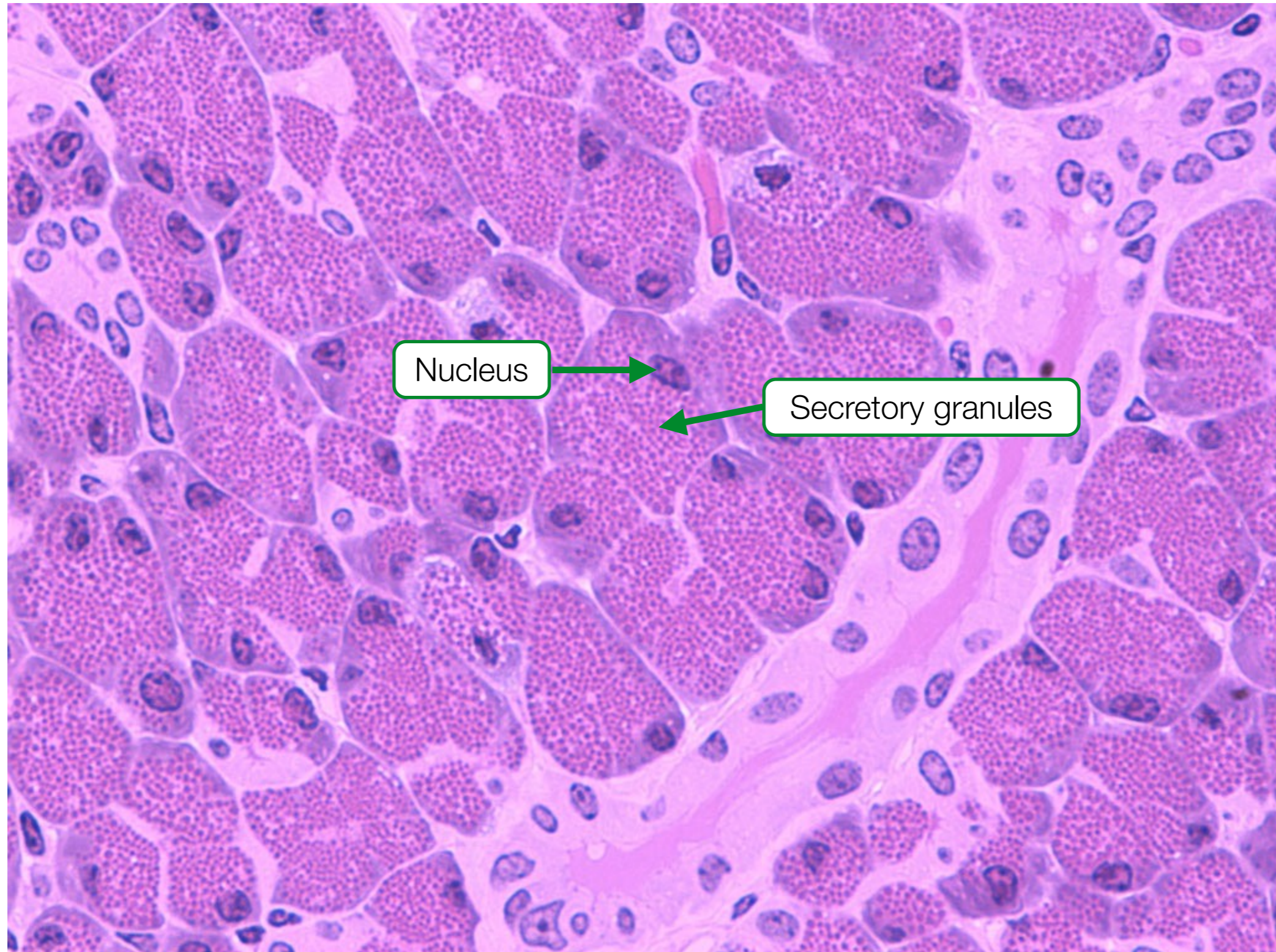
A prominent nucleolus indicates a cell synthesizing a lot protein.



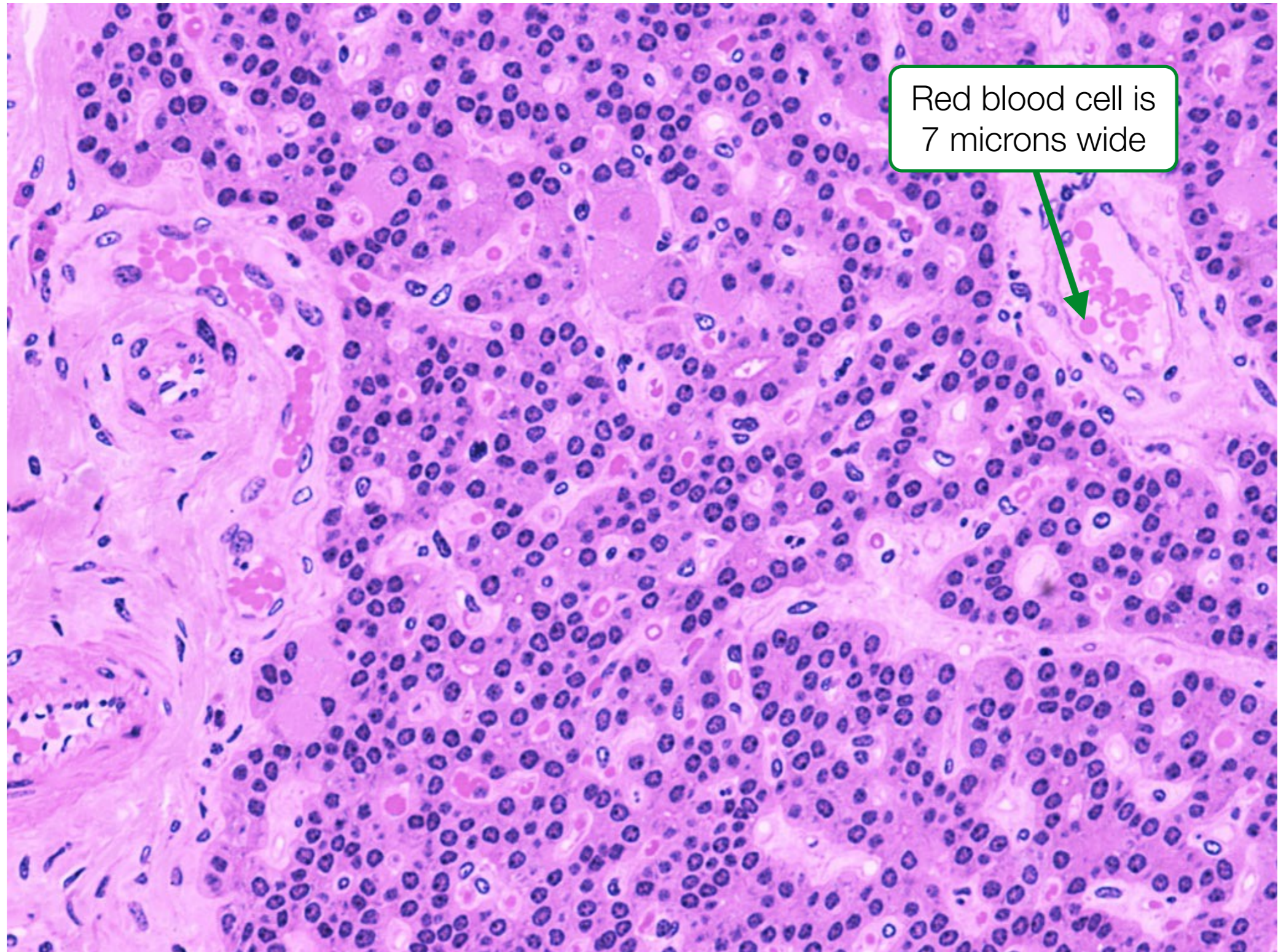
A lot of rough ER indicates a cell that is actively secreting protein.



Secretory granules indicate a cell that participates in regulated secretion of material.

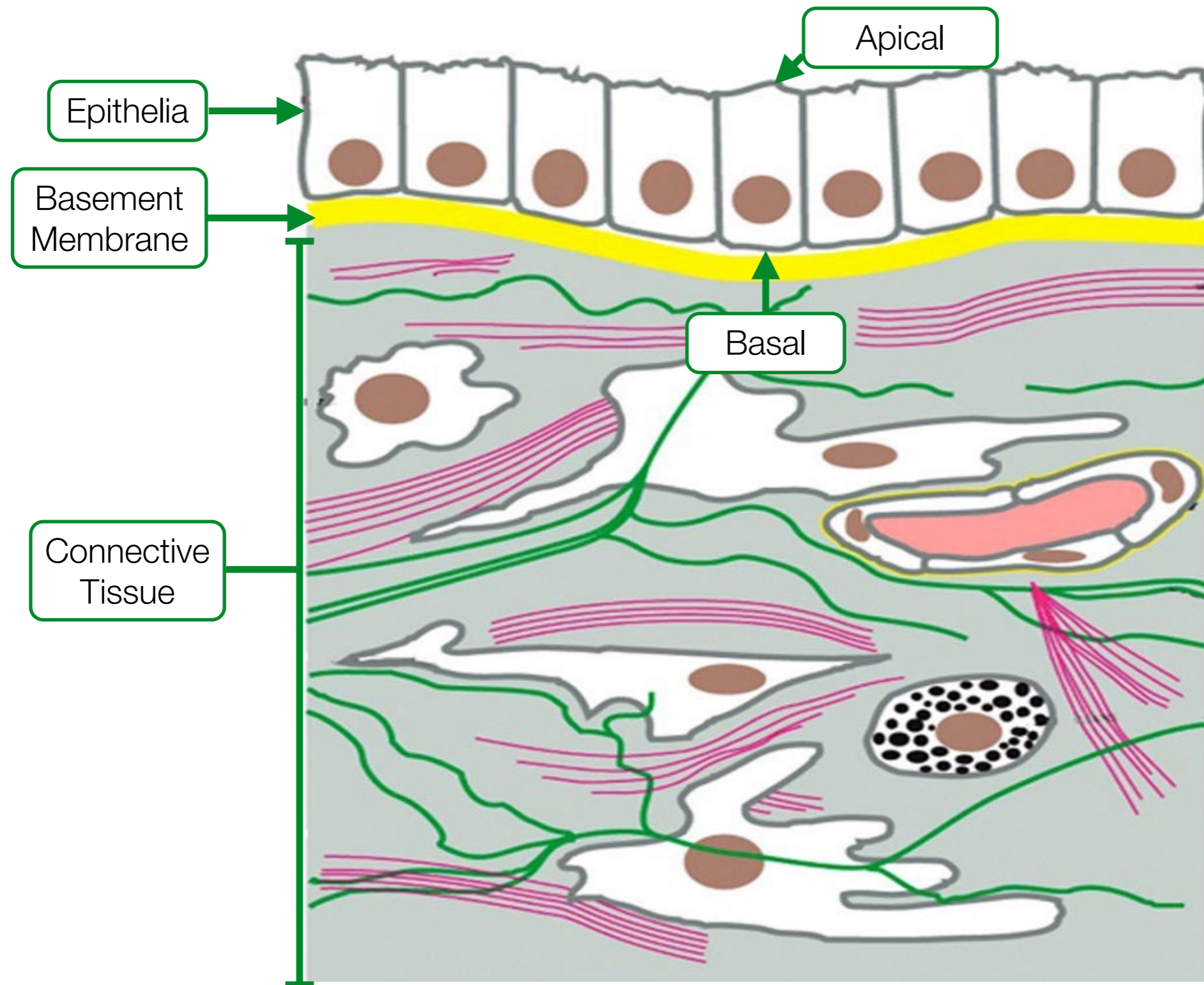


Red blood cells provide a convenient cellular ruler to measure the size of objects.

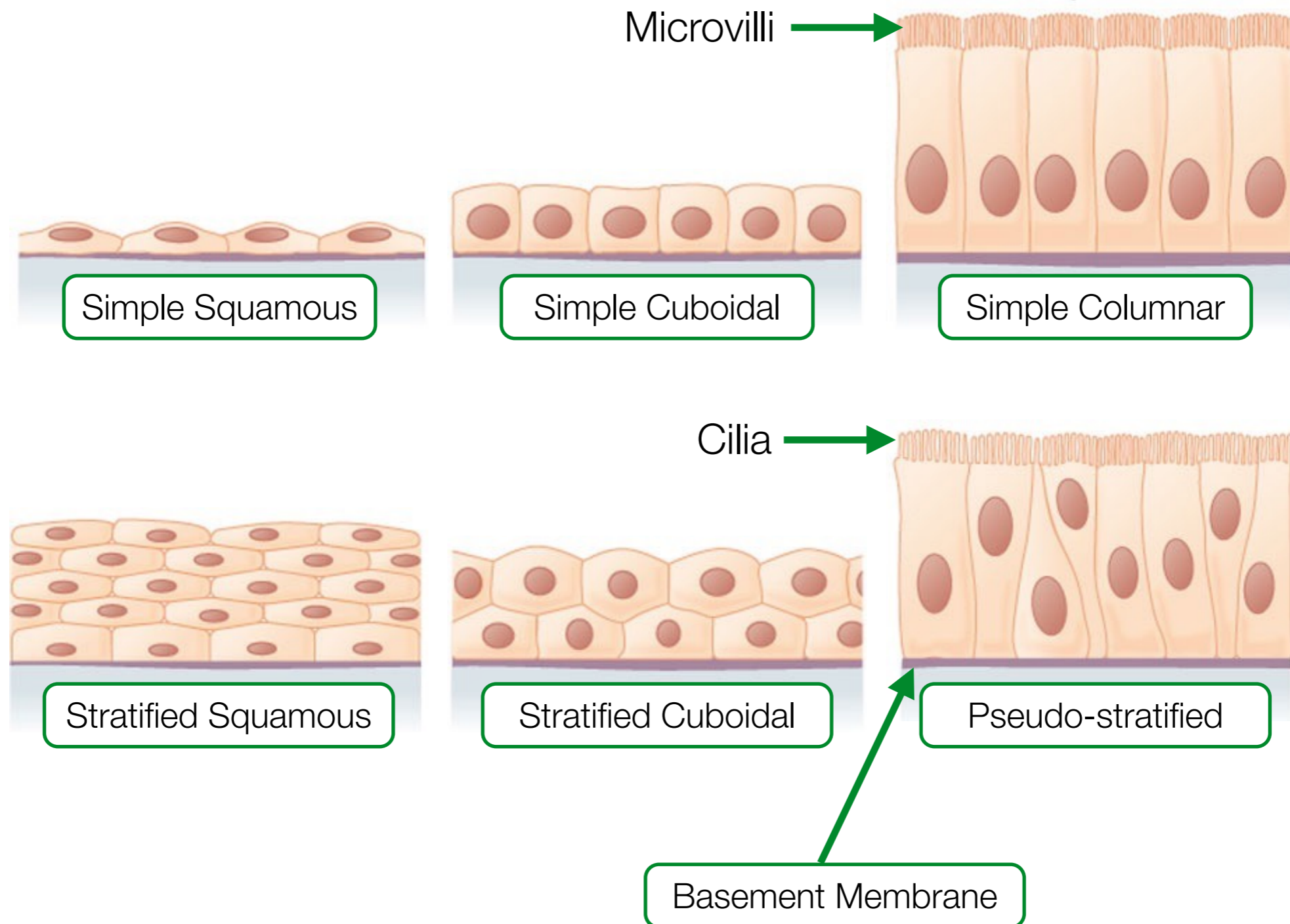


Classify epithelia in histological images

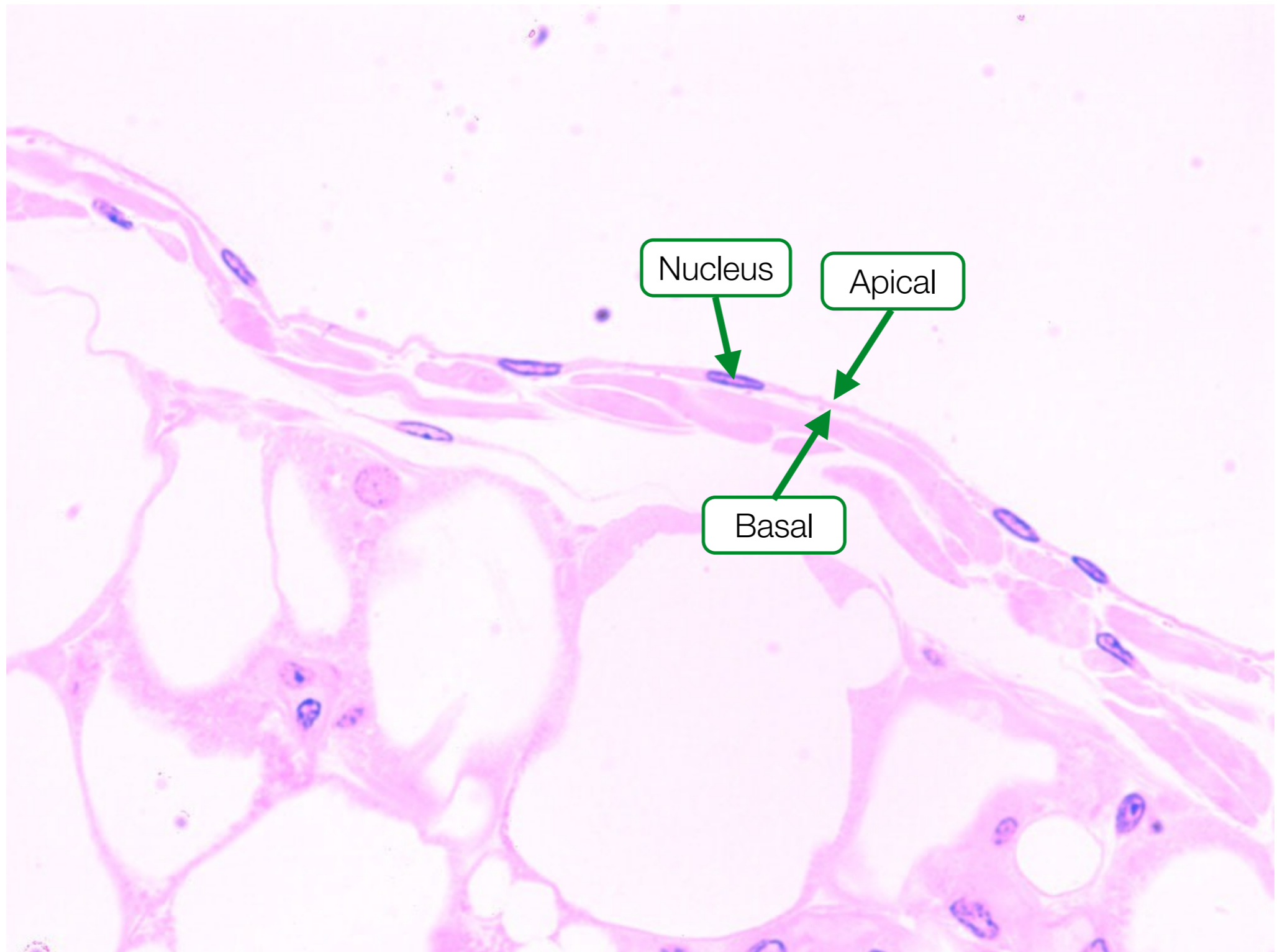
An epithelium is a sheet of polarized cells that rests on a basement membrane.



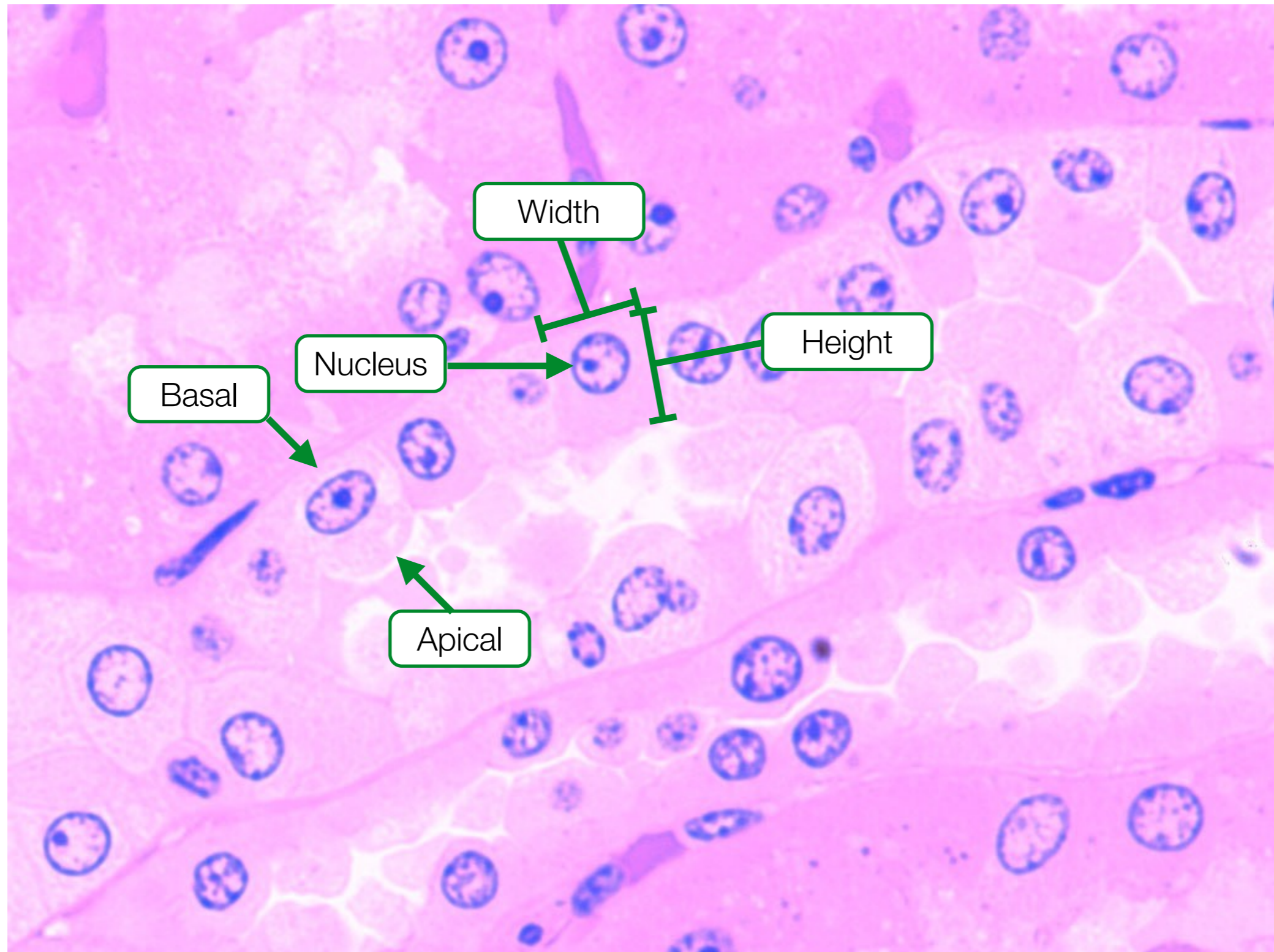
Epithelia are classified based on the shape of its cells and the number of layers of cells.



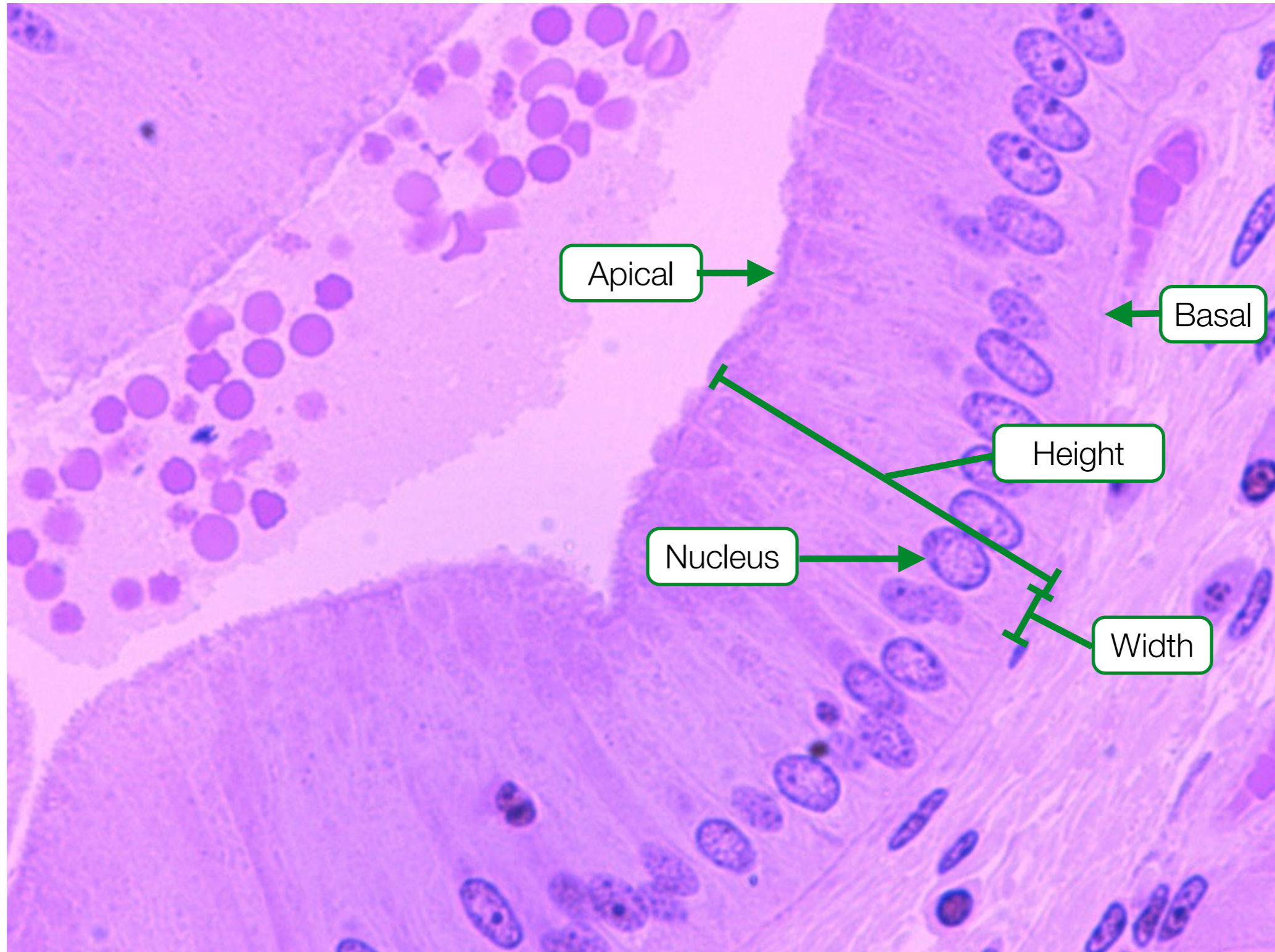
Simple squamous epithelia contain a single layer of flat cells.



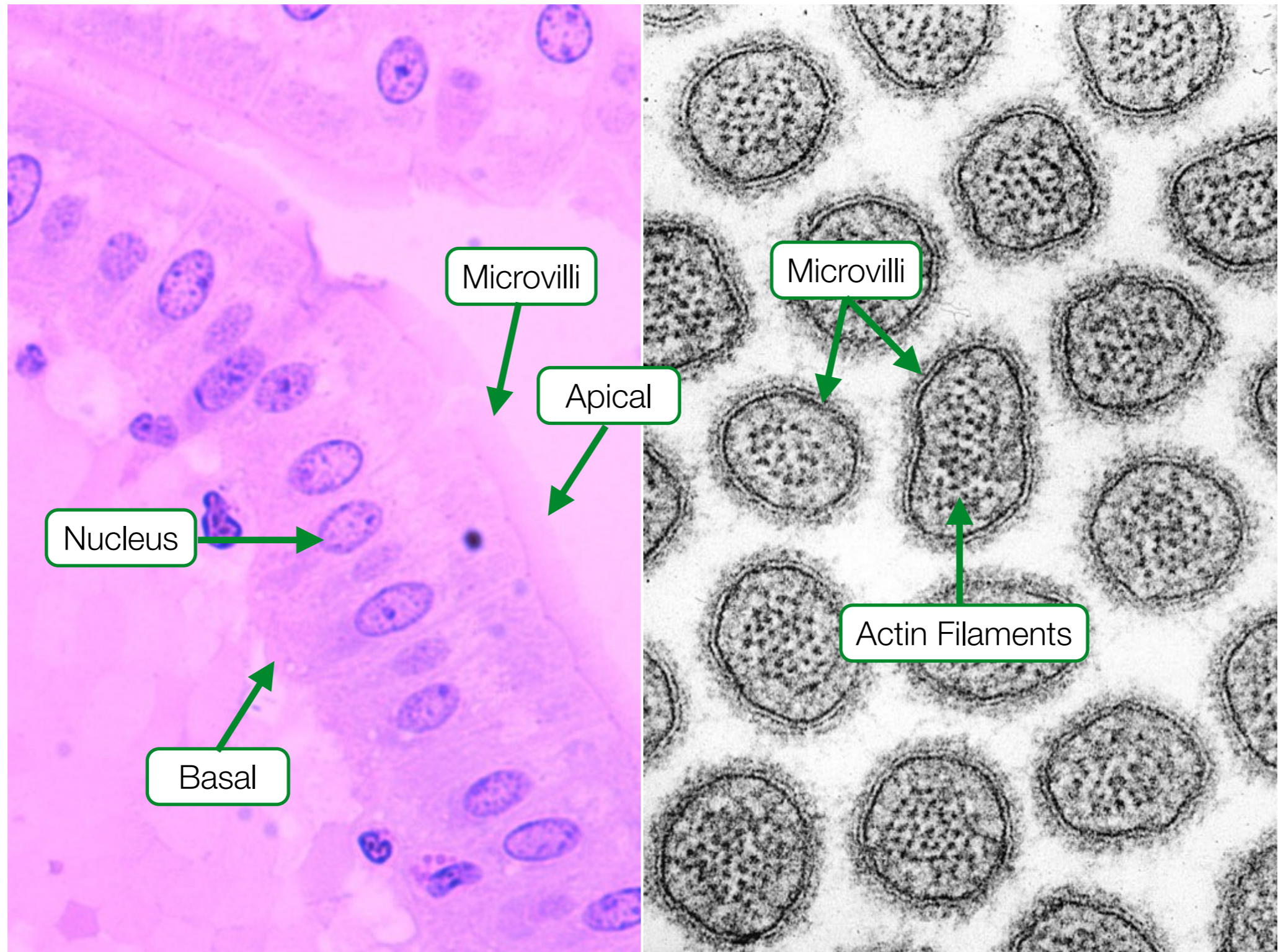
Simple cuboidal epithelia contain a single layer of squarish cells.



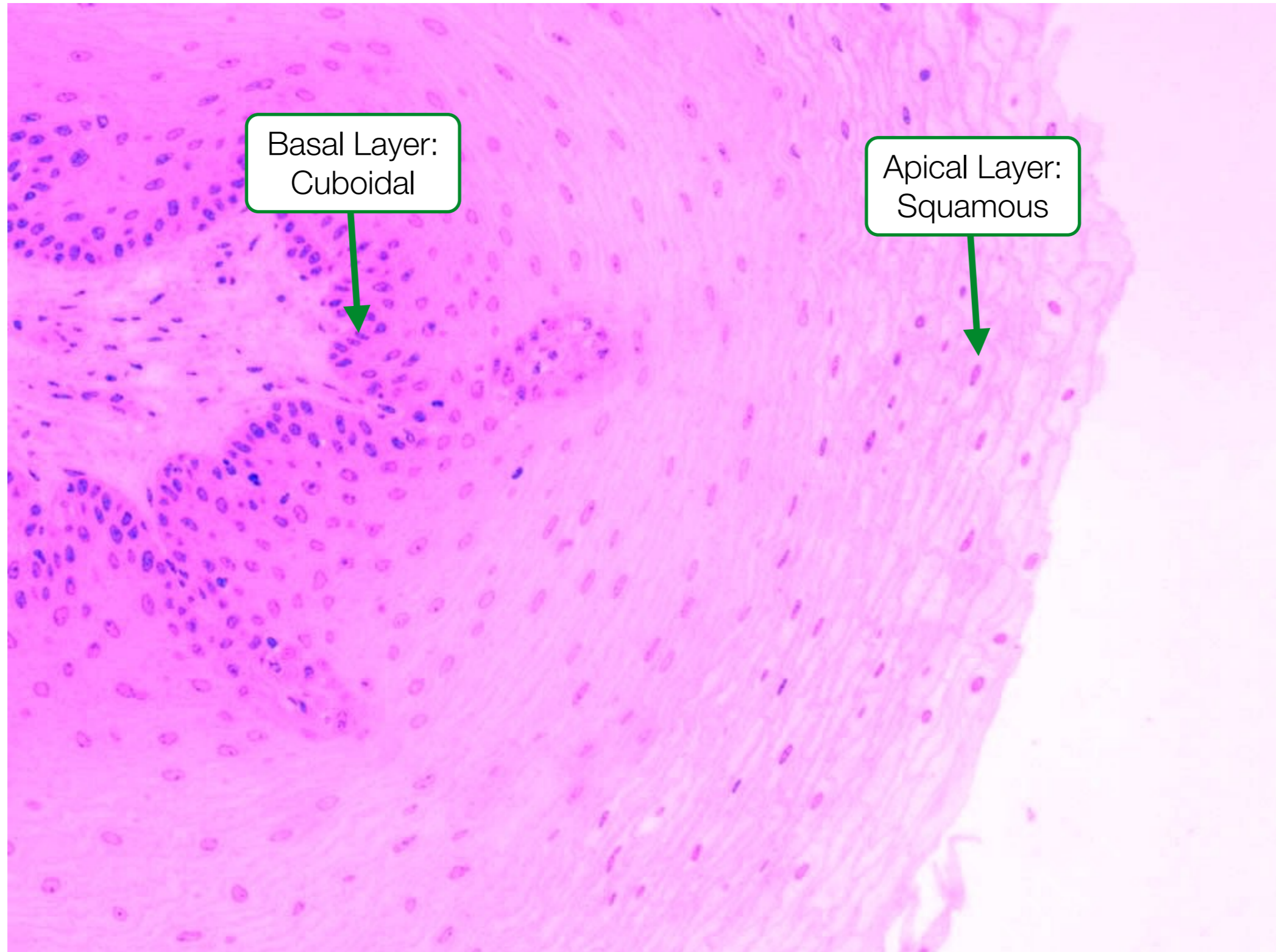
Simple columnar epithelia contain a single layer of tall cells.



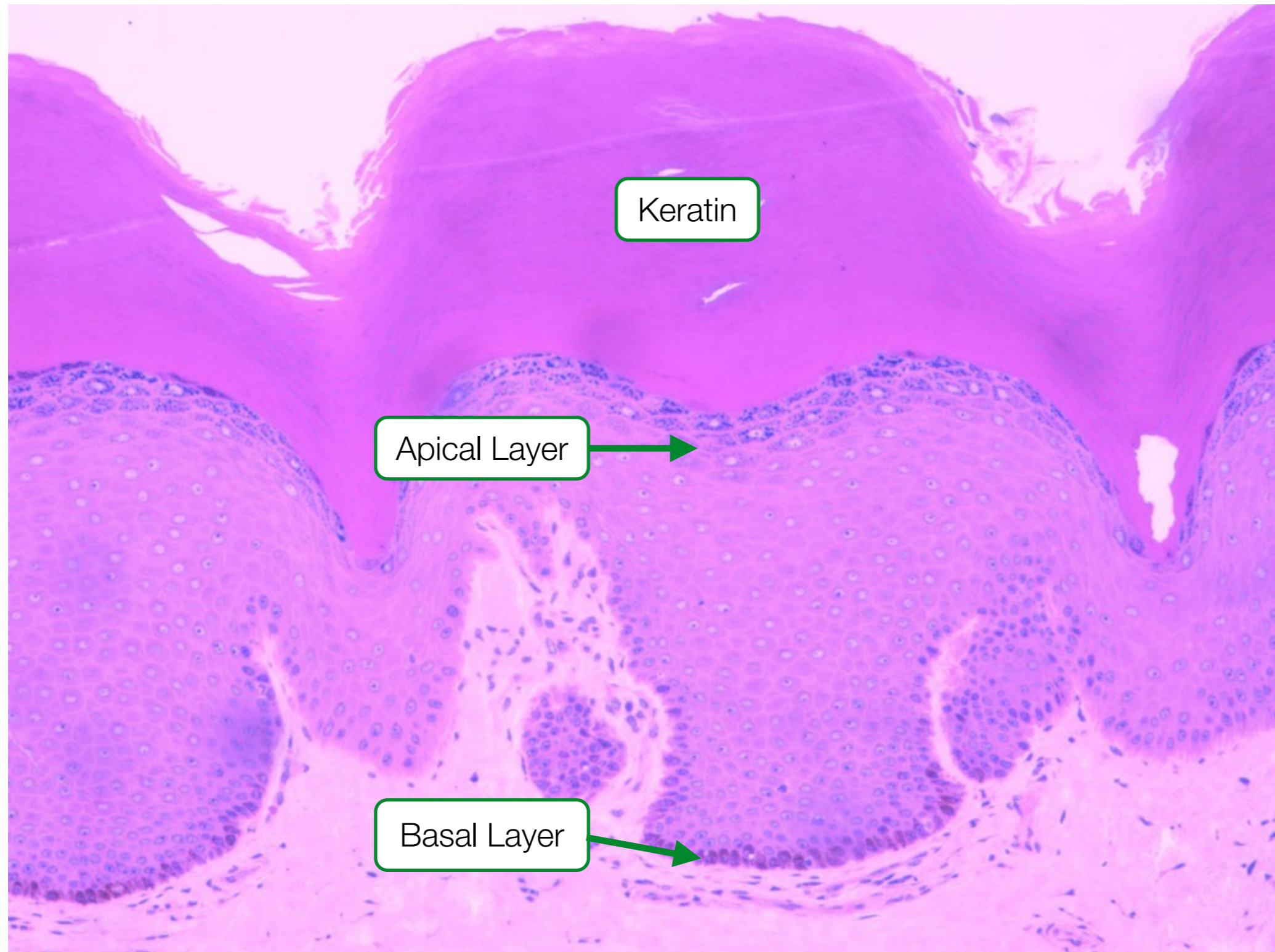
Microvilli are short, finger-like extensions of the apical membrane supported by actin filaments.



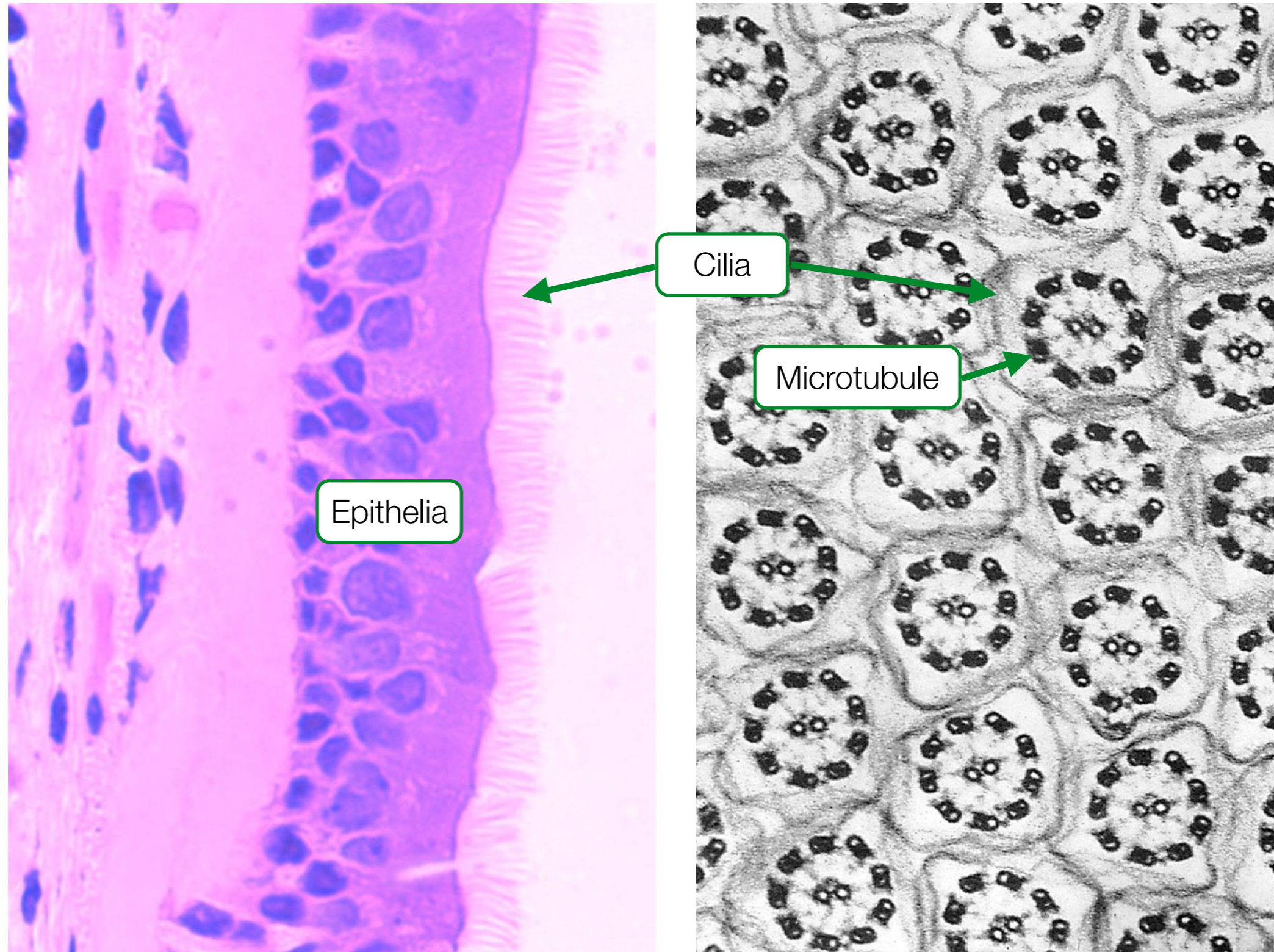
Stratified squamous epithelia contain multiple layers of cells with outer layer having flat cells.



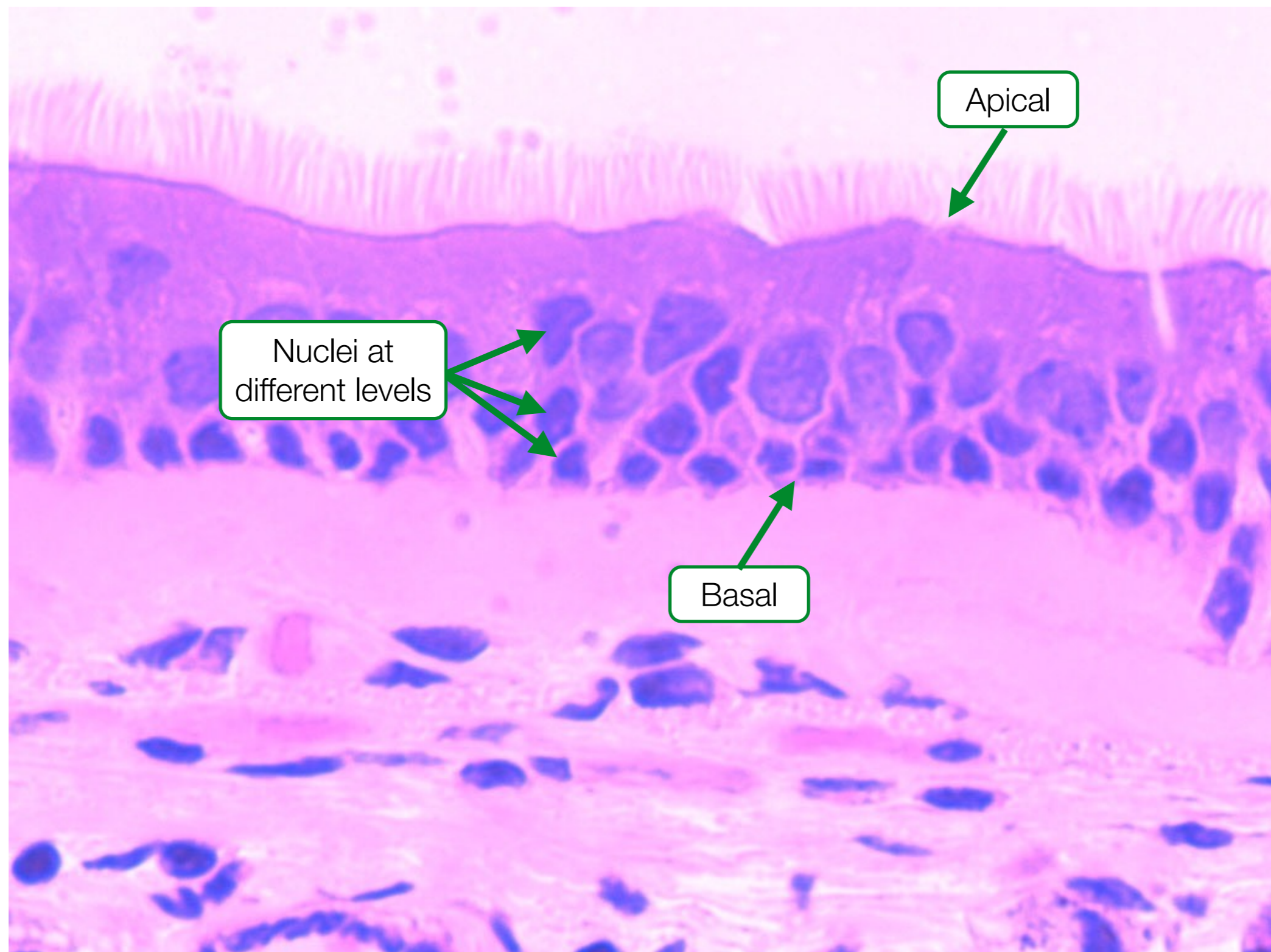
Some stratified squamous epithelia contain a layer of keratin on their apical surface.



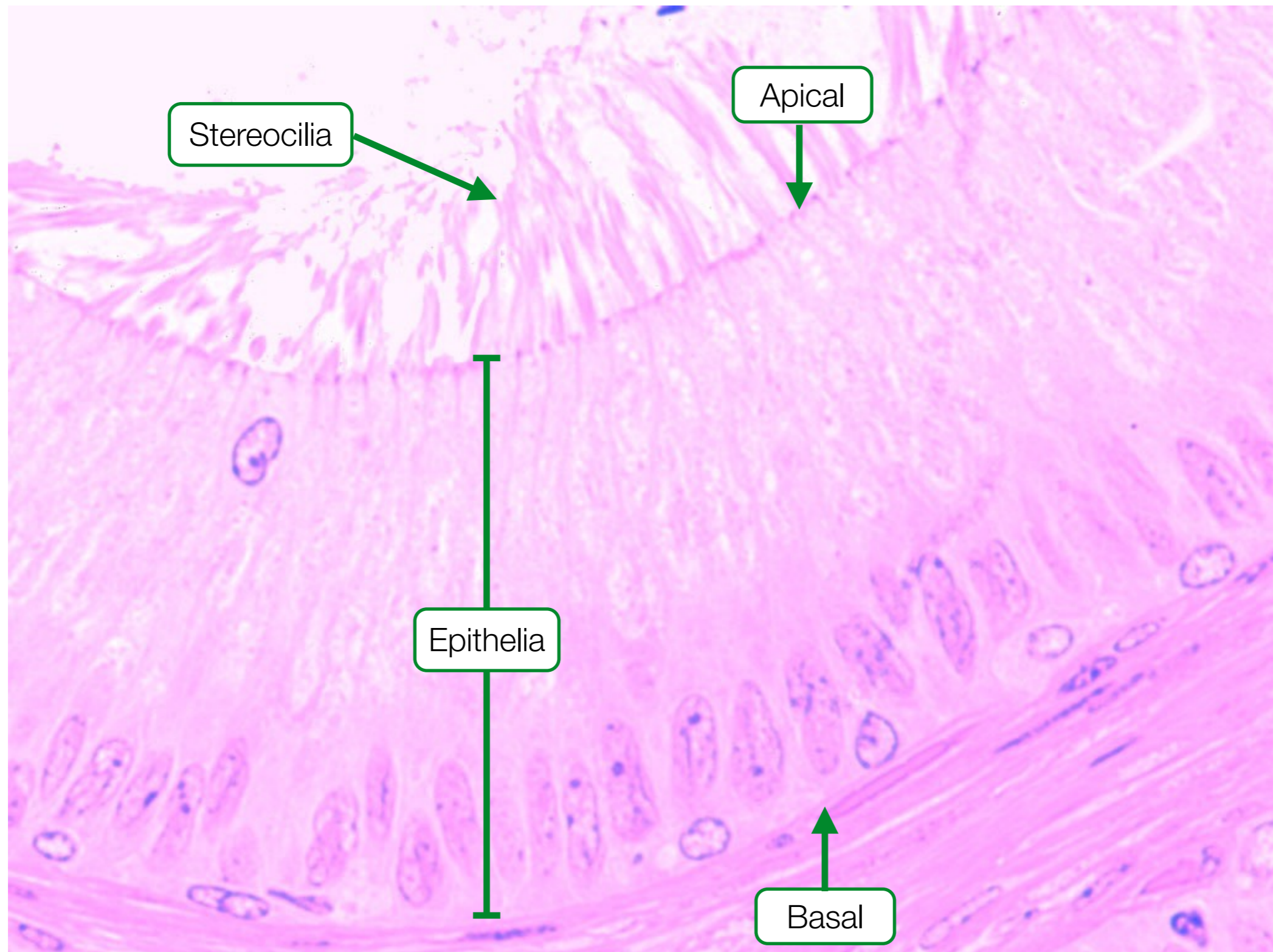
Cilia are long extensions of the apical cell membrane that generate wave-like motion.



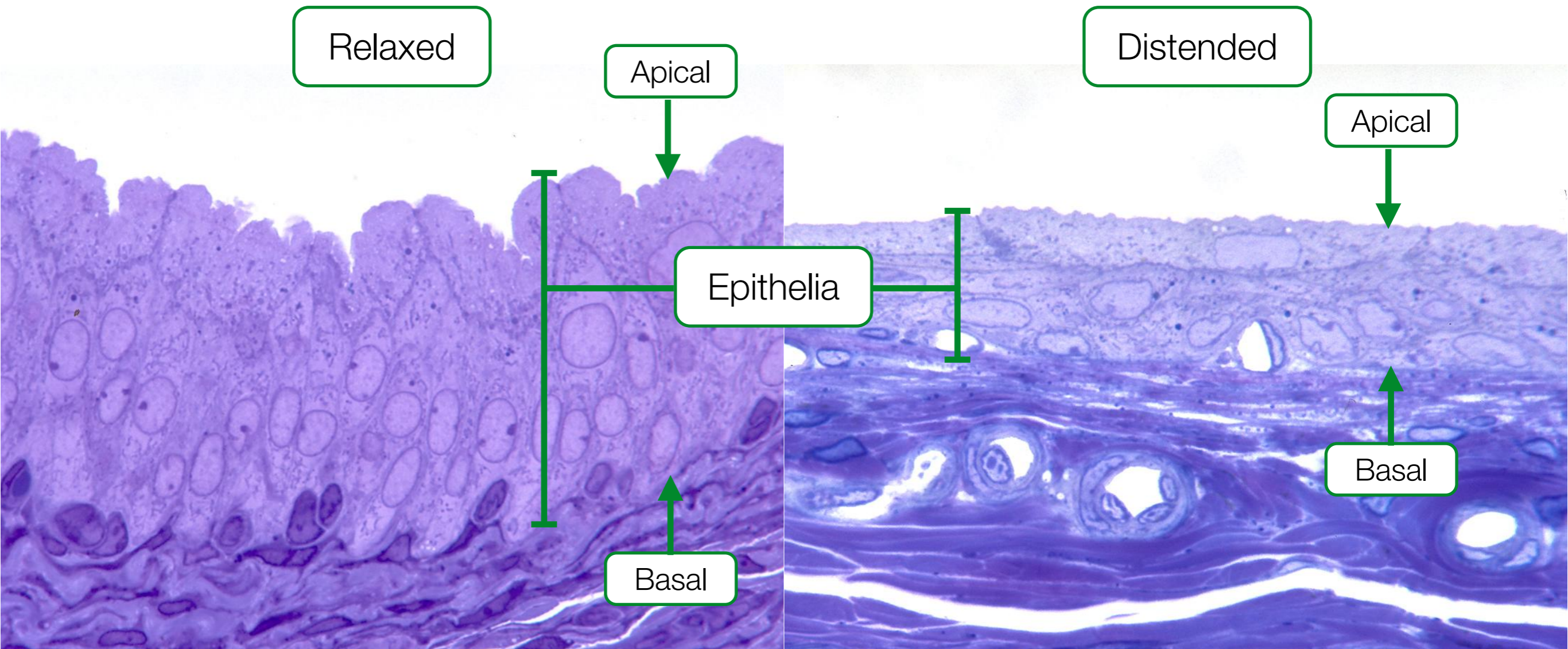
Pseudostratified epithelia appear stratified but every cell contacts the basement membrane.



Stereocilia are long, branched extensions of the apical cell membrane and are supported by actin.



Transitional epithelia change appearance when stretched.



All epithelia attach to a basement membrane via interactions along their basal surface

