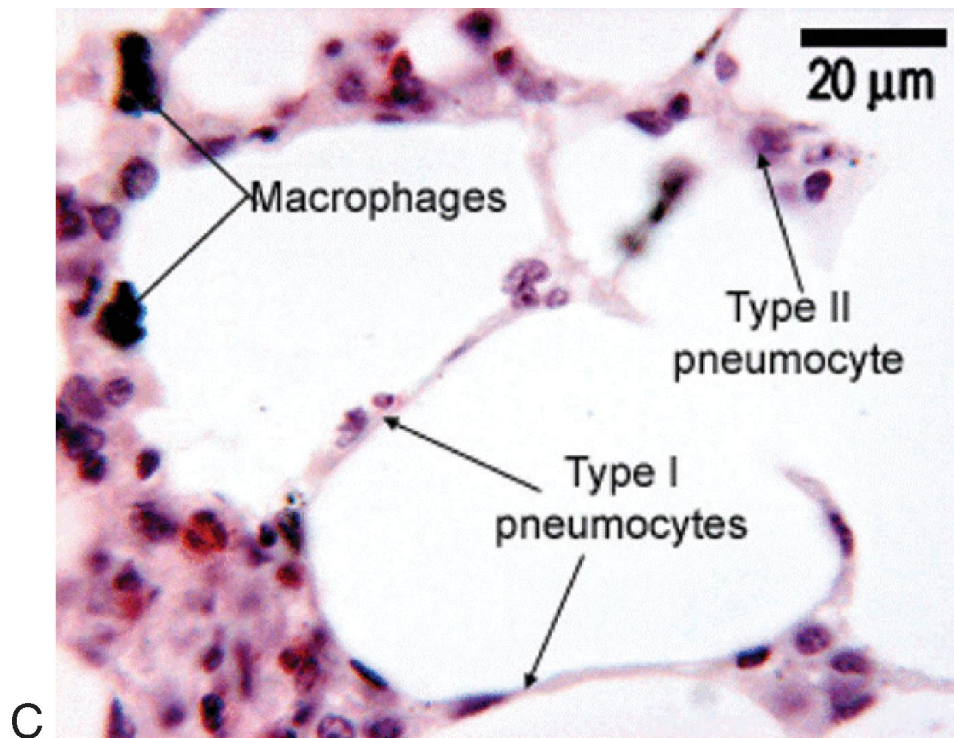


Alveolus: Microscopic Anatomy

The alveolus is the functional unit and terminal point of the lungs. It consists of thin walls (which are interestingly planar, and not rounded) to facilitate gas transfer. The surface area of the alveolus consists of 95% type I pneumocytes which are only $2\mu\text{m}$ thick. Sharing the basement membrane with the type I pneumocyte is the endothelial cells of the pulmonary capillaries. This close proximity again allows rapid and efficient gas exchange. Interestingly, the epithelial area of the alveolus and endothelial area of the capillaries have very similar surface areas.

About half as prevalent as type I pneumocytes are type II pneumocytes. The type II pneumocytes are responsible for surfactant production, recycling, and degradation. They also are the progenitor cells for the type I pneumocytes.

Although the interstitium between the epithelial and endothelial cells is typically quite thin, it does thicken periodically to accommodate other structural and functional needs of the lungs. Here one may find macrophages and the beginning of lymphatics, but more prevalent are the collagen fibers and fibroblasts that provide some degree of structure to the lung.



Further Reading: Knudsen L, Ochs M. The micromechanics of lung alveoli: structure and function of surfactant and tissue components. *Histochem Cell Biol.* 2018 Dec;150(6):661-676. doi: 10.1007/s00418-018-1747-9. Epub 2018 Nov 2. PMID: 30390118; PMCID: PMC6267411.

Smith TC, Cohen E. Cohen's Comprehensive Thoracic Anesthesia. 1st Ed. pp 29-30 (I'm also told one of the contributing authors to this text is devilishly handsome)