Ectoplasm Encyclopedia Article

Ectoplasm

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Ectoplasm

The ectoplasm is a clear region of the cytoplasm just under the cellular or plasma membrane from which all cellular organelles and macromolecules visible in the light microscope have been excluded. This is most easily seen in amoeba and other protozoans that lack a thick cell wall and are thin enough to observe in a live mount. The origin of the ectoplasm is the sol-gel transformation responsible for cytoplasmic streaming. Elements of the cytoskeleton such as microtubules and microfilaments polymerize along the cell periphery and change a portion of the cytoplasm into the gel state. Contraction of this gel creates hydrostatic pressure that causes streaming of the soluble regions of the cytoplasm (also known as the endoplasm).This hydrostatic pressure also causes some of the aqueous fluid of the cytoplasm to squeeze through the gel and to accumulate under the plasma membrane. As the fluid passes through the tight network of filaments in the gel, all macromolecules and organelles are filtered out leaving only the clear, watery solution known as ectoplasm.

This phenomenon is not of much physiological importance. Probably the most important reason for retaining the distinction between ectoplasm and endoplasm is that the later is the location of the endoplasmic reticulum, an important membranous network responsible for protein and lipid synthesis, metabolism of many toxic compounds, and a host of other vital processes.