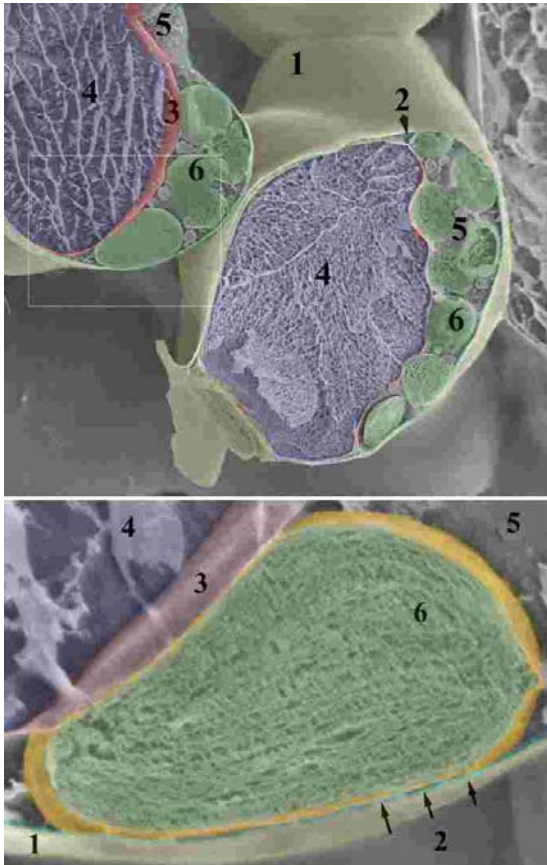


Virtual field emission scanning electron microscope (fesem)

Sponge parenchyma cells of a *Coleus* leaf

Source: <http://www-vcbio.sci.kun.nl/eng/fesem/applets/chloroplast>

Surf to the source to use the fesem simulator on this and other objects, to download a high resolution image or to view information on the principles of the microscope.



Material: a piece fresh leaf material was frozen with slush nitrogen at -95 ± 176 ; C. In order to observe the inner part of single cells, this small piece of tissue was fractured using with a special knife in the cryo-unit of the FESEM.

Overview image: This view shows the cell wall that surrounds the cell content (1; yellow). The plasma membrane (2 and arrows; blue) is appressed along the cell wall. The tonoplast (3; pink) ensheathes the vacuole (4; purple). The cytoplasm (5) occupies the space between the plasma membrane and the tonoplast. In the cytoplasm distinction is made between the cytosol (fluid) and organelles of various types, among which chloroplasts (6; green), mitochondria, endoplasmic reticulum, Golgi (not shown). The cell nucleus is not visible in this fracture.

Zoom image: Each chloroplast (6) has an own envelop (orange) that consists of two membranes. The inner compartment of the chloroplast (green) houses a complex system of thylakoid membranes that are differentiated into lamellae and stacks of disks called grana. The space around the thylakoids is named stroma. The thylakoids are the sites where the photochemical reactions of photosynthesis occur. The stroma is the site of the biochemical carbon reduction reaction. More information on photosynthesis is available in the virtual lesson on leaves:

<http://www-vcbio.sci.kun.nl/eng/virtuallessons/leaf/photosynthesis>

People and copyright

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