

INTERACTION OF LIGHT WITH LIVING CELLS

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In live cell microscopy the specimen must be exposed to light of various wavelength and intensities. Some plant and animal cells are specialized and can react to light in specific ways. For instance chloroplasts are rearranged spatially in a manner dependent on the intensity of incident light. Melanocytes can produce a pigment which acts as a photoprotector. However, most cell types studied by microscopy do not have a capacity to react specifically to incident light. Plant and mammalian cells exhibit only a limited capacity to accumulate and repair photodamage. I will discuss absorption and scattering of light on various subcellular structures, and demonstrate that scattering on and within a live cell can be extensive and lead to strong illumination of the whole cell body as well as the neighboring cells, despite the fact that the light beam is tightly focused in one spot. Further, I will discuss absorption and scattering of light on subcellular structures in the context of photodamage and the ability to obtain high resolution images.