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Functional Imaging of Single Cells in the Living Eye

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Abstract content
(Max 300 words)
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The correction of the eye's aberrations with adaptive opticshas made it possible to image the normal and diseased retina of the living eye at microscopic resolution. I will describe recent developments in the deployment of this technology, many of which combine AO and other imaging modalities with the goal of obtaining not only structural but also functional information at a cellular or subcellular spatial scale. I will illustrate the value of this approach with examples including single photon fluorescence imaging of retinal pigment epithelial cells in macular degeneration, the use of genetically encoded calcium indicators to record the neural response of individual ganglion cells in the intact eye, the use of interferometry to measure the dimensions of photoreceptors, as well as methods to measure the flow of blood cells in single capillaries noninvasively. I will also describe recent advances in two-photon imaging in the living eye, which allow us to optically probe molecular events in retinal cells that would otherwise be inaccessible.

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