



Photo Acoustic Imaging

(University of Texas)

Near infrared (IR) spectroscopy, a noninvasive method of monitoring cerebral blood oxygenation, utilizes differences in the optical absorption coefficients of oxy- and deoxyhemoglobin. Two wavelengths, one shorter and the other longer than 805 nm (the isosbestic point of oxy- and deoxyhemoglobin) are usually used in optical oximeters.

Laser optoacoustics, recently proposed as a technique for tissue characterization and diagnostic imaging, overcomes the problem of loss of diagnostic information due to strong light scattering that inevitably complicates pure optical techniques. Time-resolved detection of the pressure profiles by ultrasound transducers and analysis of the pressure signals allow reconstruction of optoacoustic images that resemble the distribution of optical absorption in the irradiated tissue with sub millimeter resolution. In contrast to pure optical methods, the laser optoacoustics permits direct reconstruction of optical absorption in tissues from the profiles of laser-induced pressure.

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