

Optical Methods of Clinical Imaging and Diagnosis

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There is always a need for improved methods of clinical imaging. Having fast, reliable imaging methods provides an invaluable diagnostic tool for health care providers. There are methods that have been in place for some time such as MRI and ultrasound that utilize magnetism and sound in order to visualize the body, but they can be expensive and they have limitations. There are newer methods of imaging that utilize the fact that molecules will absorb light at specific wavelengths. In this talk, I will discuss several of these techniques such as photoacoustic tomography which utilizes a laser set to very specific wavelengths to excite molecules of interest which release energy in the form of sound. The sound is picked up by transducers connected to a computer which converts the transducer signals to images which can then be used for several diagnostic purposes. I'll also discuss systems that employ light in the infrared and near-infrared regions to determine clinical information such as oxygen saturation and blood flow rate through vessels.