OPOTEK Inc.
Tunable Laser Systems

Thermoacoustic Computed Tomography

Thermoacoustic Computed Tomography (TCT) relies on the absorption of electromagnetic energy – such as light – and the subsequent emission of an acoustic wave (sound).

OptoSonics has devised instrumentation and software to make a precise image of the energy-absorption patterns within living organisms based on the detection of thermoacoustic signals. Light scattering, which can blur the image detail and limit how deeply we can see into the tissue, is not an issue because the “signal” we detect is carried by the thermoacoustic waves with virtually no scatter.
The figure to the right shows a photo of the animal imaging chamber of a TCT prototype scanner. An array of four fiber-optic bundles delivers pulsed laser light to the animal being imaged. The wavelength of the light can be adjusted over the range of 680-950nm. A small stepper motor rotates the mouse about the vertical axis during TCT data collection.

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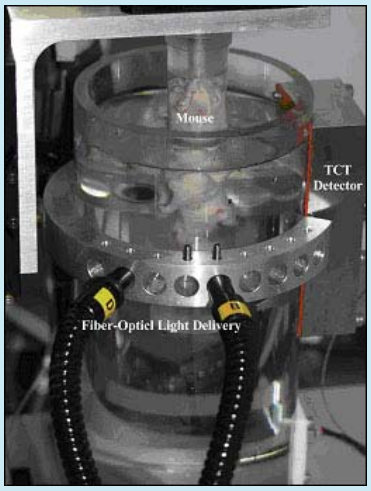

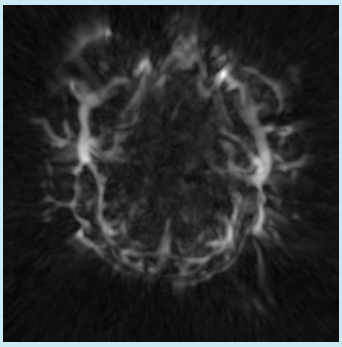

Vascular-enhanced image of mouse brain at 750 nm