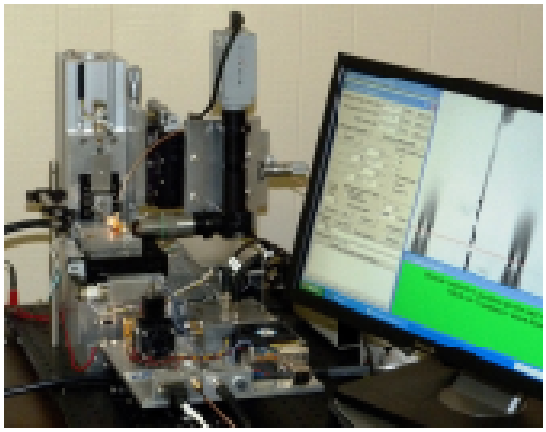
Vibratess announces a sub-THz spectrometer for cancer diagnostic and other applications (VsTS-2 and VsTS-3)

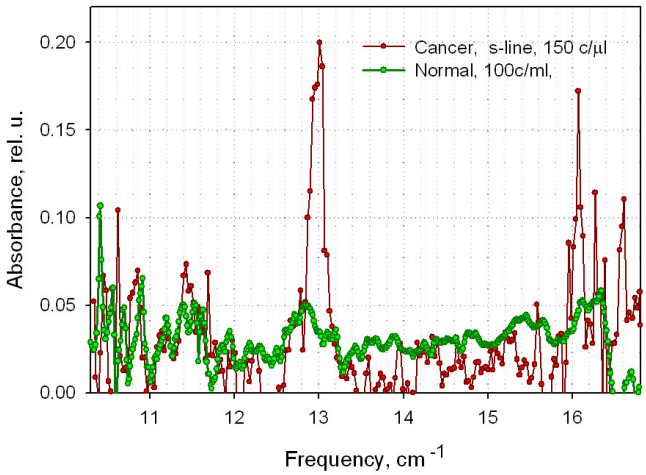


Our instrument provides an easy to use interface, with precise positioning and scanning capabilities.

Sub-THz radiation lets you see inside cells to determine molecular changes taking place during disease progression. Our instrument uses frequencies below the far IR range to avoid interactions with water, and provides information on weak intramolecular bond vibrations, like hydrogen bonds, that are unique to each molecule.

Vibratess has been developing and testing sub-THz instrumentation for visualization of specific signatures from biomolecules for almost 10 years, focusing on increasing sensitivity by enhancing the interaction of radiation with sample material using a patented array technology. The high spectral resolution of our instrument (Figure on the left) means that the individual vibrational resonance modes can be observed for biomolecules such as proteins or nucleic acids, as well as for cells. The high spatial resolution provided by use of a near field detection probe allows interrogation of less than nanogram quantities of sample material. Detection of a single cancer cell is possible. A unique spectral signature is generated from vibrational resonances of the molecules (DNAs, RNAs, proteins) within each particular cell type, allowing differences between healthy and diseased cells to be easily detected. We demonstrate dramatic difference between spectra of ovarian cancer and normal cells, with much higher intensity in cancer samples and a specific peak dominated at frequency 13 cm^{-1} (see Figure below).

Our computational prediction of signatures from relevant molecular components identified in the medical literature confirmed that this unique spectral feature of cancer originates from short molecules, micro RNAs, that are present in cancer cells in concentration several orders higher than in normal cells. Similar signatures are expected in other cancers. The rest of the cancer signature is similar to that of normal cells and represents contribution from proteins and other molecules that carry genetic information.



Spectroscopic signatures of ovarian cancer (red) and normal sample (green) obtained on our instrument.

The instrument is currently commercially available. All of our customers are provided with complete training package, as well as an initial database of sub-THz signatures for their molecules (or cells) of interest. Our services also include development of more extensive database predicted signatures over a broad THz frequency range for any molecular components of interest to our customers. Development and building of narrow sub-band customized spectroscopic sensors for detecting specific molecular or cell biomarkers is possible as well.

Additional Applications for our spectrometer include food and water quality monitoring; protein conformation changes in biomedicine and pharmaceutical processes; detecting and identifying pathogens.

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