



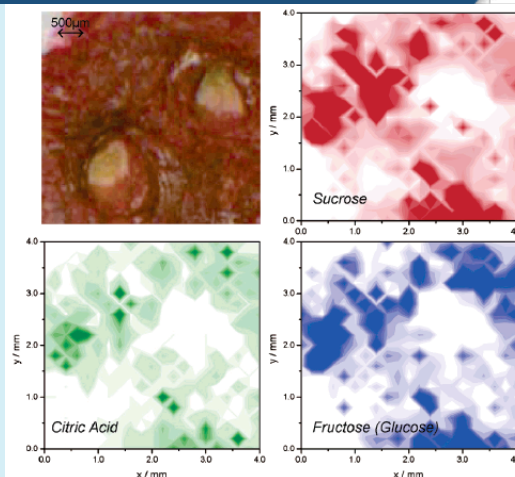
## Atmospheric Pressure IR MALDI Molecular Imaging

(George Washington University)

Molecular imaging matrix-assisted laser desorption/ionization (MALDI) mass spectrometry is an emerging field that combines the sensitivity and mass identification advantages of mass spectrometry to create a biomolecular map of tissue sections. By adding a matrix to the top layer of the tissue sections, ionization of peptides and proteins in the mass range of 1,000 to 50,000  $m/z$  is achieved by rastering a UV laser over the surface of the tissue in vacuum.

The requirement of matrix addition complicates tissue sample preparation and limits spatial resolution, and analysis of the tissue under vacuum limits the choice of matrices. By using a desorption/ionization laser that operates in the infrared wavelength region, ionization of peptides and proteins without fragmentation in the tissue sample can be achieved through absorption of the infrared light by tissue sample species, such as water. No matrix addition is necessary. Atmospheric pressure (AP) MALDI alleviates problems associated with loading the sample into vacuum.

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Optical image of strawberry skin (upper left) and three AP IR MALDI images obtained without the addition of a matrix (Li, Y.; Shrestha, B.; Vertes, A. *Anal. Chem.* **2007**, *79*, 523)