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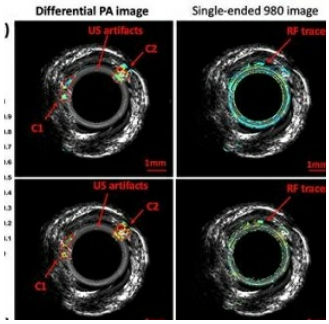
Imaging Modality Targets Cholesterol in Arterial Plaque



In an article published in the peer-reviewed SPIE publication Journal of Biomedical Optics (JBO), "Frequency-domain differential photoacoustic radar: theory and validation for ultra-sensitive atherosclerotic plaque imaging," researchers demonstrate a new imaging modality that successfully identifies the presence of cholesterol in the arterial plaque.

Cholesterol in plaque, along with fat, calcium, and other blood-transported substances, can lead to atherosclerosis, a disease which can cause heart attacks or strokes. Early detection of cholesterol can lead to earlier treatments and improved health outcomes. Toronto-based researchers have demonstrated a unique detection technique that combines laser photoacoustics, a hybrid optical-acoustic imaging technology, with low-power continuous wave lasers and frequency-domain signal processing, in an approach known as photoacoustic radar. This advanced technology can accurately evaluate plaque-based cholesterol, and allow for more timely treatment of atherosclerosis.

According to JBO Editor-in-Chief, SPIE Fellow, and MacLean Professor of Engineering at the Thayer School of Engineering at Dartmouth College, New Hampshire, Brian Pogue, the findings mark an exciting new direction in imaging: "This is an original direction of imaging research that utilizes an innovative idea of detection based upon differences between wavelengths, and signal analysis based upon radar methods. Photoacoustic imaging has the best potential for imaging through thick tissues or blood: the high-sensitivity detection of cholesterol described in this paper is made possible with a specifically modified, dual wavelength approach."

Source: Journal of Biomedical Optics
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