Breast Cancer Diagnosis Using Laser Imaging of Collagen
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Background
We have developed a method for distinguishing malignant breast tissue using optical second-harmonic generation imaging (SHG). The proposed method has the potential to be used as an in vivo diagnostic tool and may prove useful for automated classification. The technique is an obvious choice for live tissue imaging: it does not require staining or tissue preparation; it involves zero toxicity; tissue damage is reduced when compared with fluorescence imaging; and it allows intrinsic optical sectioning for 3-D image production.

Outcomes:
- Diagnostic method for breast cancer diagnosis, with potential for extension to other forms of cancer such as prostate and colorectal
- High throughput method for automated histopathology analysis and diagnosis

Progress to date:
- SHG images of malignant, benign and normal breast tissue from human biopsy samples have been produced.
- Qualitative and quantitative measures have been found that differentiate between healthy and diseased tissue.

SHG images from a) normal and b) malignant (invasive ductal) human breast tissue. Length of bar is 100 µm.

Funding/partnership is sought to extend this study to
- other types of cancer and/or
- trial in vivo applications and/or
- test the efficacy of cancer treatment

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