

# Integrated Ultrasound and Near-Infrared Diffuse Optical Imaging Probe

## Project Description:

1 in 8 women are expected to develop breast cancer, with an estimated 26,300 women are diagnosed with breast cancer each year, and approximately 5,000 will die of it. While ultrasound is used for screening+diagnosis of breast cancer, it would be enhanced by the characteristics of tumour formation, such as increased blood flow.

The team will come up with a probe design and protocol for combining ultrasound imaging and near-infrared (NIR) diffuse optical imaging. Having both on one probe means the two modalities are coregistered, and the combination can be meaningfully enhanced with the functional information. This project is on the hardware+software to run it, and the development of an optimal algorithm for image combination.

While there is already a functional DOI probe created by our group, we welcome to use as a launching-point for further work on the probe, determining the optimal combination of NIR light sources and detectors. However, complexity, and thus cost, are a major barrier to the development of useful new medical devices to developing areas, so this should be kept in mind.

## Main deliverables: