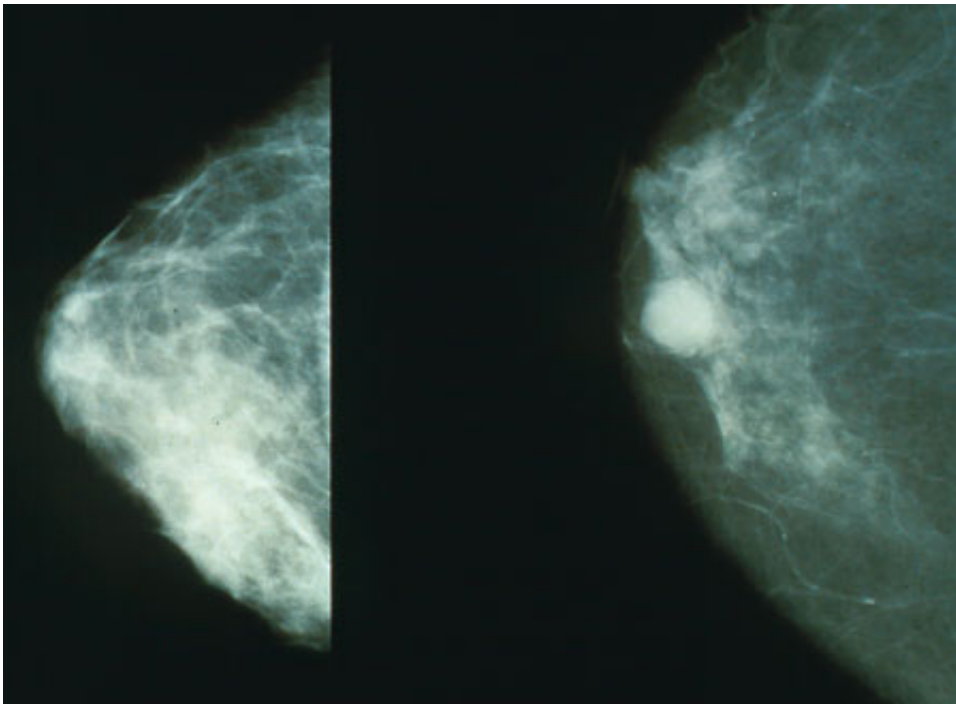# Medical Xpress

Imaging software could speed up breast cancer diagnosis

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Mammograms showing a normal breast (left) and a breast with cancer (right). Credit: Public Domain

New software could speed up breast cancer diagnosis with 90% accuracy without the need for a specialist, according to research published in the open access journal *Breast Cancer Research*. This could improve breast cancer management, particularly in developing countries where pathologists are not routinely available.

"To evaluate fresh breast tissue at the point of care could change the current practice of pathology," says Rebecca Richards-Kortum, Rice University, Houston, Texas. "We have developed a faster means to classify benign and malignant human breast tissues using fresh samples and thereby removing the need for time consuming tissue preparation."

Today, breast cancer diagnosis is an intricate process. Firstly, tissue has to be obtained, then rigorously prepared and assessed, whether this is in the context of core needle biopsy diagnosis or surgical excision. Pathologists must currently undergo a complex method to prepare tissue samples for assessment and this is followed by a lengthy diagnosis process.

The researchers used high speed optical microscopy of intact breast tissue specimens to analyze breast tissue. This automated method for diagnosing breast cancer from tissue samples is performed without the need for complex tissue sample preparation or assessment by a specialist pathologist.

"We performed our analysis without tissue fixation, cutting and staining and achieved comparable classification with current methods. This cuts out the tissue preparation process and allows for rapid diagnosis. It is also reliant on measurable criteria, which could reduce subjectivity in the evaluation of breast histology," says Rebecca Richards-Kortum.

The programme analyzes images of freshly cut human breast tissue samples taken using a confocal fluorescence microscope to determine certain parameters typically used in breast tissue analysis. These parameters are then inputted into a classification tree the researchers have developed, to determine whether the tissue sample is benign or malignant.

Although this could have substantial clinical relevance, there are

limitations that need to be overcome before the software can be regularly used. Certain criteria are reliant on the user's observations, which could lead to incorrect classification of breast tissue. Optical microscopy is not frequently used in patient care because of it is costly and has high maintenance requirements.

Lead author, Jessica Dobbs, Rice University, says "We are excited about the possibility to use these imaging techniques to improve access to histologic diagnosis in developing regions that lack the human resources and equipment necessary to perform standard histologic assessment."

  More information: Micro-anatomical quantitative imaging of breast cancer - a surrogate for pathology at the point of care. Jessica Lupinacci Dobbs, Jenna Mueller, Savitri Krishnamurthy, Dongsuk Shin, Henry Kuerer, Wei Yang, Nimmi Ramanujam, Rebecca Richards-Kortum, *Breast Cancer Research* 2015, DOI: 10.1186/s13058-015-0617-9

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