

Superior X-Ray Imaging for Early Detection of Breast Cancer

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Technology description

Summary

Professor Robert Speller and his team at University College London have developed a novel phase contrast x-ray technology with the potential for improved image quality and enhanced diagnostic potential when applied to mammography. This technology will provide earlier more accurate detection of breast cancers when compared to current clinical practices.

The Technology and it's Advantages

Robert Speller and his team have developed a new x-ray technology which gives images with a step change in quality leading to better diagnostic capability and reducing the need for additional high cost procedures. The mammographic examination is performed with no change in procedure, both at examination and interpretation thus simplifying adoption. The technology will appear the same as it uses an x-ray source and provides normal looking images however it does not measure x-ray absorption but phase.

Current X-ray imaging technology relies upon the differential absorption of the x-rays however soft tissue has poor absorption so breast images suffer from poor contrast resulting in low quality images with poor contrast ratio. Small changes in soft tissue does however cause a significant phase change in the x-rays. UCL's system contains a technology which allows the recording of this phase change leading to better image quality than achievable in today's mammographic system and improved clinical diagnosis.

The advantages of phase contrast imaging are well known and have been widely demonstrated, it's adoption has been prevented as it usually requires specialist x-ray sources such as found in particle accelerators. UCL's system overcomes this with novel patented technology. The x-ray source is a high power standard commercial source but the x-rays are coded within the equipment to allow the phase information to be recovered after passing through the subject,

The programme is currently being supported by the Wellcome Trust whose funding will achieve laboratory demonstration of the technology and evaluation of images by clinicians.

The current team will remain to take the programme through the clinical demonstration Prof. Robert Speller (co-inventor and recognised international expert in medical radiology technology) and Dr.

Alessandro Olivio (co-inventor and expert in phase contrast systems). A commercial and practical focus will be ensured by the support of both Dr. Brian Allen (consultant in technology businesses with experience in medical imaging technology) and Dr Chris Williams from UCL Business PLC.

Market Opportunity

Breast cancer remains one of the high priority cancer areas; more than 40,000 women are expected to die from breast cancer this year in just the USA and an additional 200,000 cases will be diagnosed. The National Cancer Institute says survival rates are highly dependent upon the stage of development of the cancer when it is diagnosed; early stage cancers have 95% survival rates whilst it falls to 20% at stage 4. The primary strategy in the fight against breast cancer is the routine screening of women over the age of 40 years, however the current mammographic systems produce images which require interpretation by very highly skilled experts and it is acknowledged that film based mammograms will miss 20% of cancers in women under 50 years of age. Whilst x-ray mammographic imaging remains the primary means of screening its limitations have given rise to alternative imaging technologies such as MRI and ultrasound however all have significant drawbacks, especially cost, and are limited to use in referrals for difficult cases. The US mammography equipment market is forecast to be \$585m by 2015.

Institution

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