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***Quantitative clinical evaluation of a simultaneous
PET/MRI breast imaging system; abstract***

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TITLE: Quantitative Clinical Evaluation of a Simultaneous PET/ MRI Breast Imaging System

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Objectives : A prototype simultaneous PET-MRI breast scanner has been developed for conducting clinical studies with the goal of obtaining high resolution anatomical and functional information in the same scan which can lead to faster and better diagnosis, reduction of unwanted biopsies, and better patient care.

Methods : We have developed a MRI compatible PET ring that can fit and operate inside the RF coil of the 1.5T Aurora Imaging Technologies dedicated breast MRI scanner. The PET ring is mounted on a translation system that allows vertical movement, at the same time allowing the ring to be positioned at an angle. Patients with highly suspicious or biopsy proven breast lesions were included in the study. Patients were injected with F18-FDG; following an uptake period, they underwent a supine whole body PET scan followed by scan of the breast area in the prone position. Following the whole body PET scans, the patient underwent simultaneous PET-MRI scans and then a delayed phase breast scan on the clinical PET system

Results : Simultaneous PET and MRI images were obtained on four women (mean age = 46 years) at the Taipei Medical University Hospital. The SUV values were determined from the clinical scan and compared to the values obtained with the PET/MRI system. Contrast agent dynamics were measured from the MRI images.

Conclusions : We have conducted simultaneous PET-MRI imaging in four women with suspicious or biopsy proven breast cancer. The SUV data from the two PET imaging systems and the MRI contrast kinetics are correlated with the biopsy results.

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