

ABSTRACT TEMPLATE – SCIENTIFIC PAPER & SCIENTIFIC EXHIBIT

Feasibility of biomedical spectroscopic x-ray imaging with Medipix.

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(Arial, 10 point font size, full justified. Abstracts must not exceed 250 words)

Purpose: To establish if Medipix detector technology is mature enough to perform spectroscopic x-ray imaging of biological specimens. The Medipix detectors are novel x-ray detectors able to provide energy information beyond the conventional spatial and intensity information provided by film, CR, and CT.

While the detector has been tested in physics and engineering laboratories under controlled conditions, no work had been performed within a clinical environment using real specimens. In addition, we wished to ensure our team had the skills to develop a spectroscopic 3D scanner using Medipix-2.

Methods and Materials: Initially images of mammography phantoms were obtained to test the equipment. Following this, images of breast cancer specimens were obtained by tiling multiple individual images. A micro-CT set up was developed using a fixed x-ray tube and detector, with a stepper motor to rotate the specimen. High resolution projection data of a dried bone was obtained allowing for 3D reconstruction. Finally, a 2D spectroscopic image was obtained of an human fetal hand.

Results: Diagnostic 2D images of breast cancers were obtained. Very high resolution 3D images were obtained of dried bone. Spectroscopic images of the fetal hand provided novel information to distinguish soft tissue and bone.

Conclusion: The Medipix-2 detector is robust and suitable for use within a clinical environment. The energy selective capability of the detector is novel and potentially provides a wide range of clinical benefits. The team has the skills to build and operate a 3D spectroscopic x-ray imaging systems for biomedical research.

ABSTRACT TEMPLATE – EDUCATIONAL EXHIBIT

Title (Arial, Bold, Title case, 10 point font size, left justified)

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Learning Objectives: Type text

Background: Type Text

Imaging Findings OR Procedure Details: Type Text

Conclusion: Type Text