

5th Italy-Australia Workshop:

“Synchrotron Radiation X-Ray Imaging for Life Sciences & Cultural Heritage”

Progress in Biomedical Imaging at the SYRMEP beamline of Elettra

Giuliana Tromba - Sincrotrone Trieste

on behalf of the SYRMEP Collaboration

In the last years biomedical research based on Synchrotron Radiation (SR) has undertaken a rapid growth taking advantage of the increased availability of SR facilities in operation worldwide. This has been also favoured by a better understanding of SR-based techniques and their potential, by the biological and medical communities.

At the SYRMEP (SYnchrotron Radiation for MEDical Physics) beamline of Elettra, a wide research program in biomedical imaging has been developed since 1997. Phase-sensitive techniques such as the Phase Contrast (PhC) and the Analyzer-based Imaging (AbI), in addition to absorption imaging, have been used in single projection and micro-tomography modalities.

In this framework the core program developed by our research team concerned the use of PhC for mammography. A dedicated medical facility has been developed and now is operating with the second clinical protocol with patients.

At present the research carried out by collaborative and general users of the beamline concerns the application of phase-sensitive techniques to a variety of topics including the study of lungs, soft tissues, bones, scaffolds and cartilages, with *in vitro* samples as well as with small animals.

The SYRMEP group has also developed Pore3d, a software library for the processing and the quantitative analysis of large 3D image datasets produced by micro-tomographic scans, fulfilling the increasing requests from users.

The talk will give an overview of the latest achieved results and will give a glimpse on the future research prospects and research directions for the beamline.