

Opening soon! Preparing for bio-medical imaging experiments on the IMBL at the Australian Synchrotron

Christopher Hall^{1,2}, Daniel Hausermann¹, Anton Maksimenko¹, James Pearson^{1,2}, Karen Siu^{1,2}
Alberto Astolfo¹

¹ The Imaging and Medical Beam Line, The Australian Synchrotron, Clayton, Victoria, Australia

² Monash University, Clayton, Victoria, Australia

As a result of the enthusiastic support from the Australian biomedical, clinical and materials science communities, the Australian Synchrotron has constructed a world-class facility for medical research, the ‘Imaging and Medical Beamline’¹. The IMBL began phased commissioning in late 2008 and will commence the first User programs in November 2012. It will provide unrivalled x-ray facilities for imaging for a wide range of research applications in diseases, treatments and understanding of physiological processes.

The beam line has a maximum source to sample distance of 136 m providing an exceptionally wide beam, with sufficient coherence for phase contrast imaging. Currently operating with a 1.4 Tesla multi-pole wiggler it can deliver a 40 - 50 cm wide beam, 4 – 5 cm high, to the sample position in furthest experiment enclosure. Imaging will be performed in the photon energy range 15 - 50keV with monochromatic or broad beam radiation. A three storey satellite building around and above the farthest enclosure has been constructed. This contains fully equipped pre-clinical and clinical research ancillary laboratories as well as other infrastructure laboratories for x-ray imaging.

In a planned source upgrade to a 4.2 Tesla superconducting multi-pole wiggler (SCMPW) taking place in August 2012, the maximum beam size will increase to 60 cm wide and > 5 cm deep. Installation of the SCMPW will also shift the critical energy of the spectrum to 25 keV and provide beams which would be more suitable for materials and cultural heritage radiography.

The presentation will describe the beam line in more detail and suggest how the facility might be used in cultural heritage studies.

References.

1. Hausermann et al, AIP Conf. Proc 1266-3 (2010) pp3-9