

The health and life sciences research in the Canadian Light Source

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The Biological and Life Sciences (Bio/Life) Department, an essential unit at the Canadian Light Source, is composed of several facilities¹: Canadian Macromolecular Crystallography Facility (CMCF), Biomedical Imaging and Therapy Facility (BMIT), Biological X-ray Spectroscopy (BioXAS) and Mid Infrared Spectro-microscopy (Mid-IR).

Recently, we have upgraded the infrastructure of the Bio/Life Department, especially at the BMIT beamlines². Now, the beamlines provide quality images from microns to tens of centimetres and produce fast images in in-situ and operando experiments for a broad range of spatial scales. The CMCF beamlines are the only beamlines that can be accessed exclusively remotely. The CMCF beamlines support research not only of academic researchers but also about 30 pharmaceutical companies involved in drug development programs. The BioXAS beamlines have been tailored to characterize and image metal distributions in the biological samples at physiological concentrations. Mid-IR beamline and associate off-line instruments are ideal for studying biomedical and biological materials.

For the last 5 years the Bio/Life Department contributed to more than 100 peer-reviewed publications annually³. The health and life sciences investigations ranged from brain diseases⁴, bone diseases^{5,6,7}, COVID-19⁸, malaria treatment⁹, cancer therapy¹⁰, developing new medicines¹¹, small and mid-size live animals' studies¹², TB treatment¹³, as well as connective tissues imaging¹⁴. This presentation will highlight the most important discoveries resulting from our work.

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