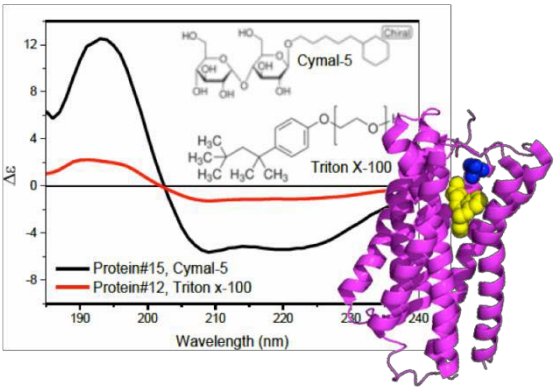
The use of X-rays and SRCD in membrane protein research

Dr. Isabel de Moraes

[1]*Imperial College, London*
[2]*MPL, Diamond Light Source Ltd., Diamond House, Harwell Science and Innovation Campus, Didcot, Oxfordshire. OX11 0DE*

For more than 50 years, synchrotron radiation (SR) has been fundamental in many areas of science discovery including physics, material sciences, chemistry, biology and medicine. The advent of genomics and proteomics initiatives combined with high-throughput technologies, such as automation, miniaturization, integration and third-generation synchrotrons, has enhanced membrane protein structure determination rate. However, the growth of membrane protein crystals suitable for X-ray diffraction studies amazingly remains a fine art and a major bottleneck in the field. It is often necessary to apply as many innovative approaches as possible. Here, it is presented the latest methods and strategies used to improved membrane protein crystals and the impact that third-generation synchrotron radiation has made in the field by summarizing the latest strategies used at synchrotron beamlines for screening and data collection from such demanding crystals. In addition, it will be highlighted how Synchrotron Radiation Circular Dichroism (SRCD) spectroscopy has lately proved to be a valuable tool in assessing the quality and stability of the membrane proteins prior to crystallization through the far UV and near UV region analysis.



Email corresponding author: i.moraes@imperial.ac.uk