Australian Synchrotron
USER MEETING 2014
20 – 21 November
National Centre for Synchrotron Science

Contribution ID : **34** Type : **Oral**

High-throughput synchrotron SAXS studies on lipidic mesophases

Thursday, 20 November 2014 14:00 (20)

Self-assembled lipidic cubic phases are attracting increasing interest as biocompatible carriers of large biomolecules including proteins, peptides, DNA and drugs [1]. A suite of new high-throughput techniques, to formulate libraries of lipidic mesophases, and structurally characterize them using the SAXS/WAXS beamline at the Australian Synchrotron, are described. Samples are contained within any standard 96-well plate and mounted directly in the beamline. The technique is applicable to any combination of lipids, additives and solvents and sample masses down to 100 µg may be analysed. Up to 8000 samples may be produced robotically and screened in a 24 hr period. The technique is exemplified using the application of membrane protein crystallization [2]. We demonstrate how this high-throughput method allows screening of the extremely large variable physiochemical space for crystallization, which would be unreasonable to explore using traditional experimental methods. In addition the application of this technique to a wide variety of applications for lipidic mesophases will be described, including pharmaceutical (drug discovery, drug delivery, gene therapy and medical imaging), materials science (biosensors, detergent industries), biology (long-term storage of fragile proteins, crystallization) and chemistry/physics (fundamental surfactant and lipid phase behaviour studies), which are currently restricted by difficulties in handling and characterizing this highly viscous material.

1. Conn, C. E.; Drummond, C. J., Soft Matter 2013, 9 (13), 3449-3464.
2. Conn, C. E.; Darmanin, C.; Mulet, X.; Le Cann, S.; Kirby, N.; Drummond, C. J., Soft Matter 2012, 8 (7), 2310 – 2321.

Keywords or phrases (comma separated)

Summary

Primary author(s) : Dr CONN, Charlotte (RMIT)

Co-author(s) : Dr HAWLEY, Adrian (Australian Synchrotron); Dr DRUMMOND, Calum (RMIT University); Dr DARMANIN, Connie (La Trobe); Ms VAN 'T HAG, Leonie (University of Melbourne / CSIRO); Dr KIRBY, Nigel (Australian Synchrotron); Dr MUDIE, Stephen (Australian Synchrotron); Dr LE, Tu (CSIRO); Dr MULET, Xavier (CSIRO)

Presenter(s) : Dr CONN, Charlotte (RMIT)

Session Classification : Soft Matter

Track Classification : Soft Matter