Review of: "[Review] Contemporary Physical Methods in Studies of Lipid Phase Polymorphism"

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Potential competing interests: No potential competing interests to declare.

The authors have written a very interesting review of some contemporary physical methods in studies of lipid phase polymorphisms.

I have a minor comment (below), and I recommend the manuscript for publication.

In the second paragraph the authors state that methods such as small-angle X-ray diffraction and freeze-fracture electron microscopy (FFEM) “do not reflect dynamic process and that they offer a static picture of structural features of membranes treated at temperature greatly lower than physiological temperatures.” While this is true for the latter method (FFEM), small angle scattering methods such as SAXS and SANS are/can be performed at physiological temperatures.

For example, see:

Heller, W.T. Small-Angle Neutron Scattering for Studying Lipid Bilayer Membranes. *Biomolecules* **2022**, 12, 1591.

Matviykiv, S. et al. Small-Angle Neutron Scattering Study of Temperature-Induced Structural Changes in Liposomes. *Langmuir* **2019**, 11210-11216.

Simidjiev, I. *et al.* Self-assembly of large, ordered lamellae from non-bilayer lipids and integral membrane proteins in vitro. *Procl Natl Acad Sci USA***2000**, 1473-1476.

Indeed, Simidjiev *et al* using SAXS have shown that the light harvesting antenna protein of photosystem II (LHCII) destroyed the hexagonal H_{II} phase formed by MGDG (monogalactosyldiaglycerol) and led to the formation of a lamellar phase.