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Protomembranes at the origin of life

Planet Earth is about 4.5 billion years old. In this study, we focused on the membranes of the first forms of living entities that assembled from a set of simple molecules available on the prebiotic Earth. The lipid membrane is a structure formed by hydrophobic or amphiphilic biomolecules called lipids, which are used in living organisms for many purposes, as a barrier between the interior of the cell and their environment, for energy storage, or signalling. The amphiphilic character of lipids allows the self-assembly in solution into a variety of supramolecular structures. The main structures are micelles, vesicles and droplets. In particular, membranes are the structures that form vesicles and can be used to mimic the walls of living cells. As the prebiotic synthesis of amphiphilic molecules favours the shorter chains, this work has focused on fatty acids, fatty alcohols and phospholipids including saturated chains of 10 carbon atoms, which are among the shortest capable of self-assembling into bilayers. Different models, all closely related to each other, have been used and studied here as proto-membrane models.

Various neutron scattering techniques, among them SANS, diffraction, EINS and NSE, have been employed to characterize physico-chemically these systems [1 - 3] and to conclude about their ability to form proto-membranes.

1. L. Misuraca, A. Calio, I. Grillo, A. Grelard, P. M. Oger, J. Peters and B. Demé, Langmuir, 2020, 36, 13516-13526.

2. L. Misuraca, B. Demé, P. Oger and J. Peters, Communications Chemistry, 2021, 4, 24, 21 - 28.

3. L. Misuraca, A. Calio, J. G. LoRicco, I. Hoffman, R. Winter, B. Demé, J. Peters and P. M. Oger, Life, 2022, 12, 445.

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