Development of asymmetric liposomes to mimic plant plasma membrane

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Although liposomes can be criticized in terms of relevance to mimic real biological membranes, they give access to information at molecular or atomistic levels that are difficult to study *in cellulo* (compounds penetration/location into membrane, specific interaction with particular lipids, etc.). In biophysical studies on liposomes, the asymmetric nature of the lipid distribution is often overlooked despite its role in several biological mechanisms. However, in the last decades, several protocols have emerged to obtain asymmetric liposomes mimicking mainly human plasma membrane. In this work, two different approaches have been investigated in order to form asymmetric liposomes that mimic plant plasma membranes. The first one is based on the well-known cyclodextrin mediated lipid exchange strategy to produce large unilamellar vesicles (LUVs) with a well-defined size distribution and is developed with phosphatidylserine and phosphatidylcholine. The second approach uses the hemifusion to obtain asymmetric giants unilamellar vesicles (GUVs) containing phosphatidylcholine, glucosylceramide and sitosterol. The vesicles obtained with the two approaches have been characterised in terms of asymmetry, size uniformity and stability.