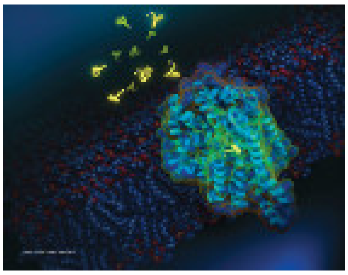

Contribution ID : **20** Type : **not specified**

Contr. Talk 9 - On the kinetic stability of non-ionic surfactant vesicles.

Thursday, 13 September 2018 16:00 (20)

Surfactant/lipid vesicles are closed bilayer aggregates that are interesting to understand because of their importance in several biological processes. They are often surprisingly stable, partly because of an intriguing stability against Ostwald ripening. If, in addition, fusion events are rare, a vesicle dispersion may retain its size distribution for weeks and months. For this reason, kinetic stability of vesicles is sometimes misinterpreted as thermodynamic stability. Here we will focus on vesicle (membrane) fusion and how its kinetics depends on the surfactant monolayer spontaneous curvature, H0. As model system we have studied the binary water-C10E3 (CH3(CH2)9(OCH2CH2)3OH) system, where H0 of the non-ionic surfactant monolayer can be conveniently tuned by varying the temperature.(We use the convention that curvature away from water is counted as positive, thus, H0 decreases with increasing temperature, H0≈10-3(T0-T) where T0 is the "balanced temperature" where H0=0). In the vicinity of H0=0 (here, T≈26 ℃), the surfactant may form two different bilayer phases. A lamellar phase, when H0>0 (T<26 ℃) and a sponge phase when H0<0 (T>26 ℃). Interestingly, it is found that the lamellar phase can in excess water be fragmented into kinetically stable uni-lamellar vesicles, while the sponge phase can not. Above 26 ℃ vesicles spontaneously fuse and the rate increases with increasing temperature. The fact that vesicle fusion typically requires H0<0 is consistent with membrane fusion models involving the so-called stalk intermediate structure. Vesicle fusion was also studied with giant uni-lamellar vesicles using rapid confocal laser scanning microscopy.

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Session Classification : Model Biomembranes: Late afternoon session