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A Time-Resolved Study on Nanodisc-to-Vesicle Transformation MU-PING NIEH, IMS/CMBE, Uinversity of Connecticut, SUANNE MAHABIR, WAN KEI WAN, University of Western Ontario, JOHN KASTARAS, Oak Ridge National Lab/CNBC — Structural phase diagram of a phospholipid mixture composed of dimyristoyl phosphatidylcholine (DMPC), dihexanoyl phosphatidylcholine (DHPC) and dimyristoyl phosphatidylglycerol (DMPG) contains many rich morphologies, e.g., nanodiscs also known as "bicelles", bilayered ribbons, unilamellar vesicles (ULVs), multi-lamellar vesicles (MLVs) and perforated lamellae. In this report, we will present time-resolved small angle neutron scattering and dynamic light scattering measurements of the structural transformation from nanodiscs to ULVs as a function of temperature, lipid concentration and charge density. The result will reveal the growth rate of nanodiscs and all the intermediate structures along the transformation process. Through the understanding of the kinetic pathway, the size and polydispersity of the self-assembled nano-size ULVs can be well-controlled. These ULVs can be used as a carrier for therapeutics or imaging probes.

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