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Kinetics of the Formation of Tethered Black Lipid Membranes on Ultraflat Gold Supports: A QCM-D and AFM Study BRIAN DORVEL, HENK KEIZER, RANDY DURAN, University of Florida — The cell membrane is recognized as the foundation to which most essential cellular processes originate and occur; thus elucidation of the structure, dynamics, and function of biomembranes is of fundamental importance if we are to mimic nature. Supported, freestanding lipid bilayers known as black lipid membranes (BLM's) are commonly used as stable biomimetic systems and exist as supported BLM's (sBLM's) and tethered BLM's (tBLM's). Although much work has been done on the kinetics of formation in sBLM's on several substrates, very little is known on the kinetics of tBLM's. By using Quartz Crystal Microbalance with Dissipation Factor (QCM-D) we were able to monitor both the kinetics and viscoelastic properties of tether adsorption and liposome fusion. Atomic Force Microscopy pictures taken complement the QCM-D data, showing the major stages of tBLM formation and pathways of liposome fusion.

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