Abstract Submitted
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Scalable Lipid Multilayer Microarraying[1] TROY LOWRY, STEVEN LENHERT, Florida State University — A need exists for scalable, high thoughput screening of both lipophilic drug candidates and biosensors. Surface-supported lipid multilayer nanostructures are lipid molecules thicker than a bilayer with controlled thickness physisorbed to a substrate and have promising applications in scalable drug screening...[1] and biosensing....[2] Uniform lipid nanostructures with multilayers of controlled thickness are essential for drug screening in order to control the dosage of drug candidates and for adhesion of cells. Methods for controlling lipid multilayer thickness have been shown using DPN nanolithography[2] and multilayer stamping.[3] In order for scalability to be achieved, multiple different lipid multilayers need to be arrayed onto the same surface. In this work, liposomal lipid concentrations are microarrayed onto an 'ink-palette' made of PDMS and in combination with multilayer stamping, lipid nanostructures are patterned onto a substrate. Characterization of the patterns is shown using fluorescence and atomic force microscopy. The method is used to test how different lipid-drug combinations alter the efficacy of drugs. .1 Kusi-Appiah, A. E., Vafai, N., Cranfill, P. J., Davidson, M. W. & Lenhert, S. Lipid multilayer microarrays for in vitro liposomal drug delivery and screening. *Biomaterials* **33**, 4187-4194, doi:10.1016/j.biomaterials.2012.02.023 (2012). 2 Lenhert, S. *et al.* Lipid multilayer gratings. *Nat. Nanotechnol.* **5**, 275-279, doi:10.1038/nnano.2010.17 (2010). 3 Nafday, O. A., Lowry, T. W. & Lenhert, S. Multifunctional Lipid Multilayer Stamping. *Small* **8**, 1021-1028, doi:10.1002/smll.201102096 (2012).

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