

Abstract Submitted  
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**Mechanics, morphology, and mobility in stratum corneum membranes**<sup>1</sup> PETER OLMSTED, CHINMAY DAS, University of Leeds, School of Physics & Astronomy, MASSIMO NORO, Unilever Discover Port Sunlight — The stratum corneum is the outermost layer of skin, and serves as a protective barrier against external agents, and to control moisture. It comprises keratin bodies (corneocytes) embedded in a matrix of lipid bilayers. Unlike the more widely studied phospholipid bilayers, the SC bilayers are typically in a gel-like state. Moreover, the SC membrane composition is radically different from more fluid counterparts: it comprises single tailed fatty acids, ceramides, and cholesterol; with many distinct ceramides possessing different lengths of tails, and always with two tails of different lengths. I will present insight from computer simulations into the morphology, mechanical properties, and diffusion (barrier) properties of these highly heterogeneous membranes. Our results provide some clue as to the design principles for the SC membrane, and is an excellent example of the use of wide polydispersity by natural systems.

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Peter Olmsted  
University of Leeds, School of Physics & Astronomy

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