

Getting under your skin: How does the sebum oily layer interact with epidermic lipids?

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Abstract

The skin is the largest organ of the human body. It acts as a barrier for our body to prevent the invasion of foreign pathogens and water loss. The Stratum Corneum (SC) is the outmost layer of the skin and it is the main actor in ensuring the proper functionality of the skin as a barrier¹. The sebum oily layer is generated in the sebaceous glands and then deposited on the skin surface. It has been shown to play a key role in skin hydration and waterproofing, in the antimicrobial properties of the skin and in the transport of antioxidants². This work shows, with a microscopic approach, namely, molecular dynamic computations, how structural and mechanical properties of the SC lipid matrix are affected by the surrounding sebum oily layer, with a specific focus on the wettability of the sebum oil-SC interface. Our final aim is to give an insight into the capacity of surfactants, nano-objects, small molecules or pathogen agents to penetrate through a more realistic skin barrier, in order to design a non-invasive, patient-friendly option for drug delivery.

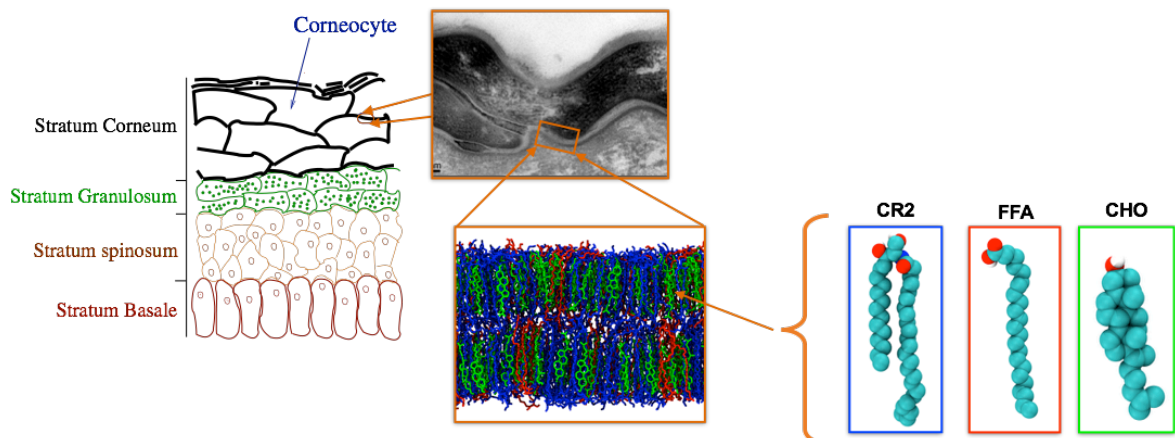


Figure 1: The Stratum Corneum lipid matrix

¹ Das, C., Noro, M. G. & Olmsted, P. D., *Biophysical Journal* 97, 1941–1951 (2009)

² Drake, D. R., Brogden, K. A., Dawson, D. V. & Wertz, P. W., *J. Lipid Res.* 49, 4–11 (2008).