

Transdermal delivery of bioactive molecules and drugs

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Transdermal delivery lab

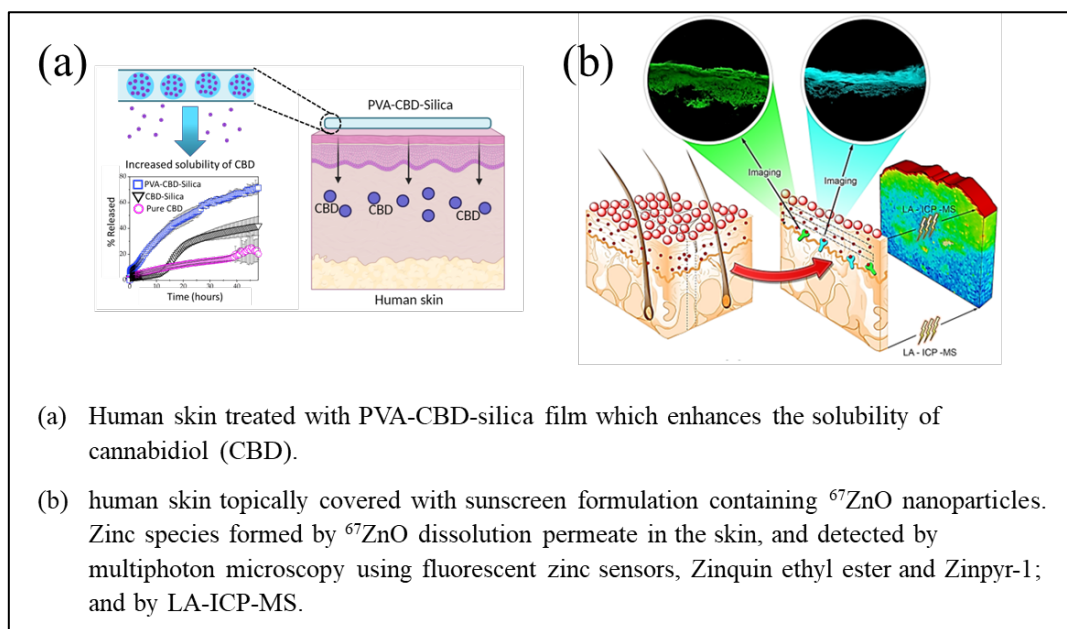
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Skin is the largest organ of our body and acts as a strong protective barrier against the environment. It is composed of several main layers with various structures that limit the diffusion of molecules across it. At the same time, it offers a convenient and attractive route of administration for the systemic delivery of bioactive ingredients and drugs in the pharmaceutical and cosmetic industries. In particular, it can be a suitable and alternative route for the steady and controlled release of hydrophobic bioactives/drugs that are difficult to be administered by other routes.

This talk will highlight our capabilities in the centre of Facilitated Advancement of Australia's Bioactives (FAAB) at Macquarie University in transdermal delivery of bioactives and drugs. FAAB is an academia-industry consortium that leads research into bioactive markets. Some of the current and past projects in our transdermal delivery lab will be discussed with a focus to introduce our topical formulations based on mesoporous silica particles as drug delivery carriers as well as developed and validated analytical methods and characterization techniques to measure skin absorption of targeted compounds and assess their toxicity levels.



(a) Khabir, Z., Partalis, C., Panchal, J. V., Deva, A., Khatri, A., & Garcia-Bennett, A. (2023). Enhanced Skin Penetration of Cannabidiol Using Organosilane Particles as Transdermal Delivery Vehicles. *Pharmaceutics*, 15(3), 798.

(b) Khabir, Z., Holmes, A. M., Lai, Y. J., Liang, L., Deva, A., Polikarpov, M. A., ... & Zvyagin, A. V. (2021). Human epidermal zinc concentrations after topical application of ZnO nanoparticles in sunscreens. *International Journal of Molecular Sciences*, 22(22), 12372.