In vivo Confocal Raman Spectroscopy Analysis of the Penetration Process of the Alpha-Tocopheryl Acetate into Stratum Corneum

The Confocal Raman Spectroscopy *in vivo* is an effective tools for Penetration Process Analysis of Alpha-tocopheryl acetate in the stratum corneum. Different concentrations of the vitamin E derivative are found on the SC, depending on the area and depth of the body examined, showing the process of penetration.

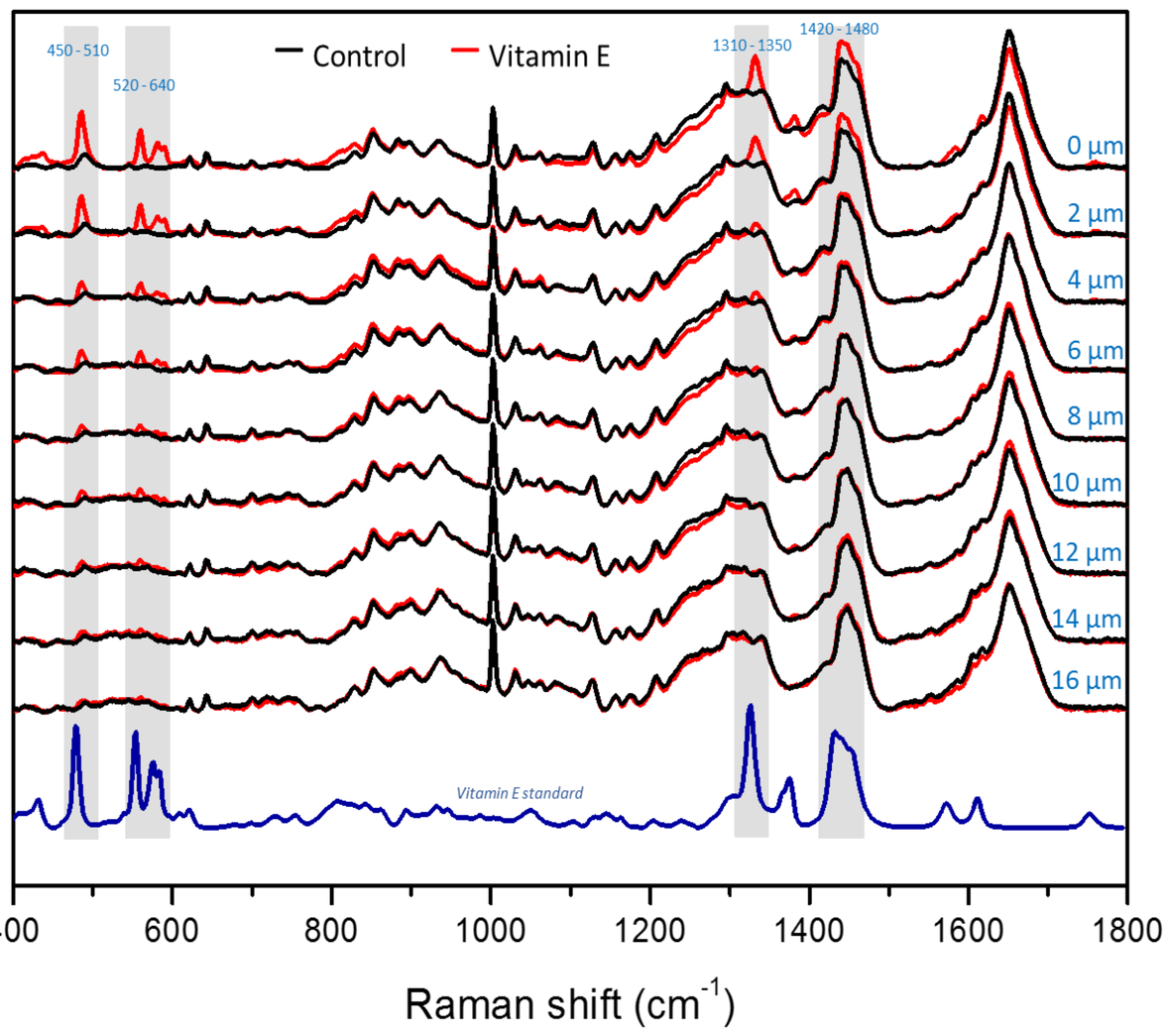

Figure 1: Average of Stratum corneum Raman spectra in differents depths.

- 4 study participants – volar forearm
- Three spectra by depth (surface until 16 µm) – before and after application of (a-TA)
- Confocal Raman (Rivers Diagnostic) with 785 nm excitation line and a CCD detector
- Qualitative analysis and molecular simulation

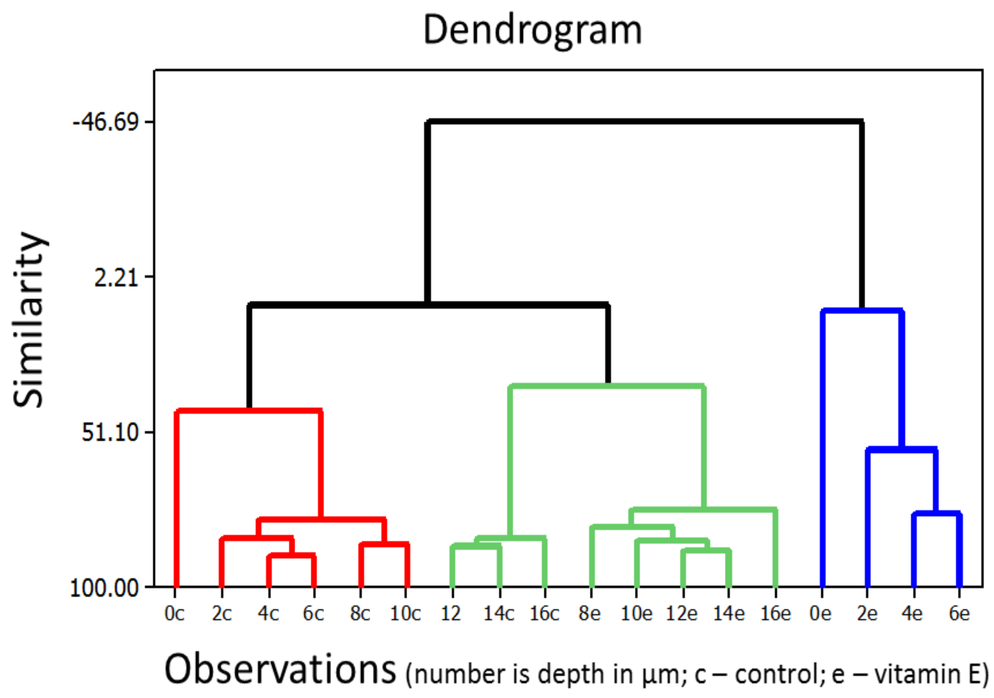

Figure 2: Cluster analisys of Raman spectra.

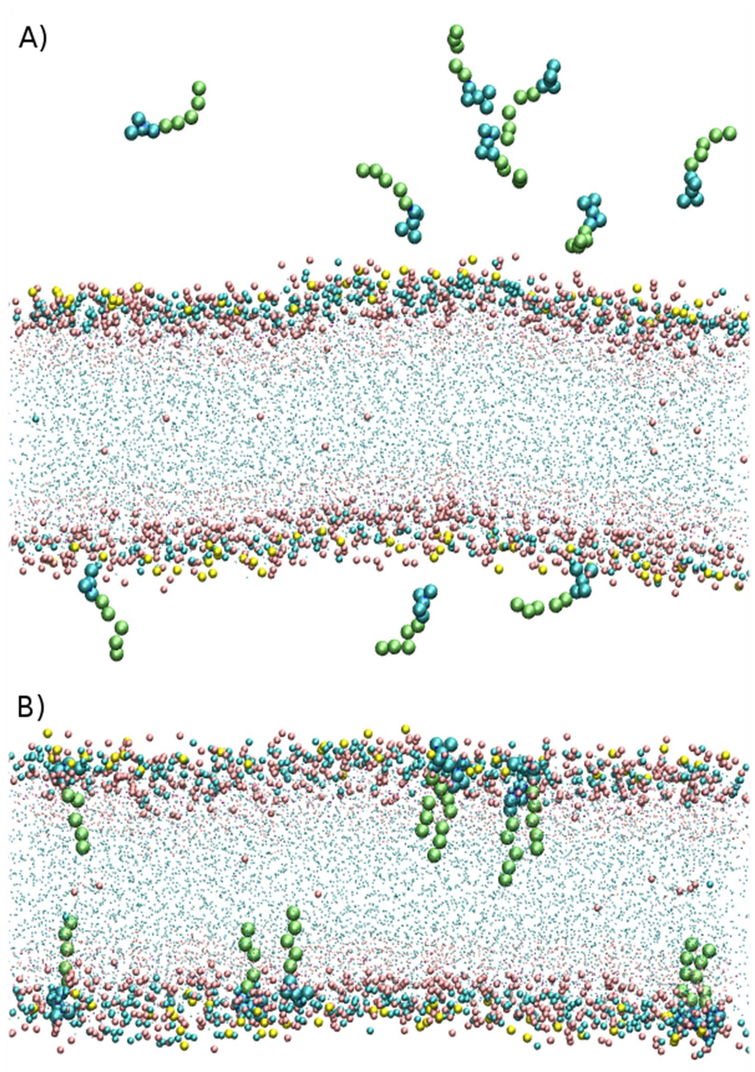

Figure 4: Molecular dynamics: a) Vitamin E and stratum corneum and b) Final snapshot after 100ns of simulation.

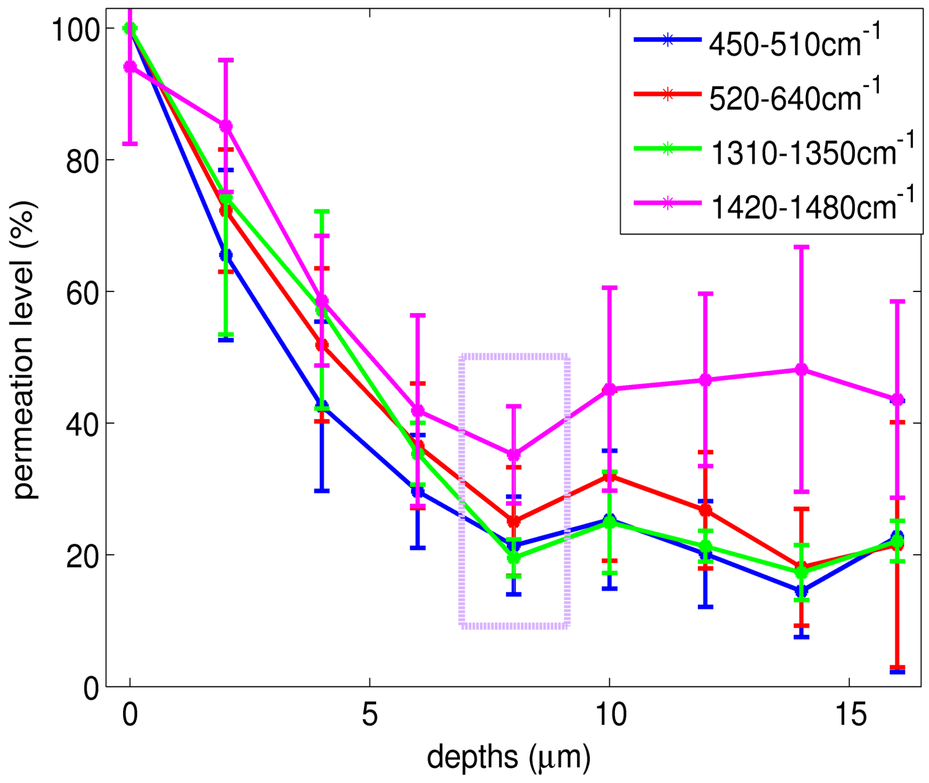

Figure 3: Permeation level (%) of α-TA into stratum corneum.

Our results detect the penetration of the a-TA in different SC depths. The HCA shows the separation of the Raman spectra (before and after application of a-TA) considering the four regions of Raman shift: 1450-510, 520-640, 1310-1350 and 1420-1480 cm^{-1} (characteristic peaks of the vitamin E derivative).