Improved Barrier Function

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Traditional 3D epidermal models deliver good cornification and stratification, however they have always suffered from poor barrier function.

A detailed evaluation by Schäfter-Korting et al. (ATLA, 2008) found that commercially available 3D epidermal models were 2x to 8x more permeable than in vivo skin (depending on the test chemical).

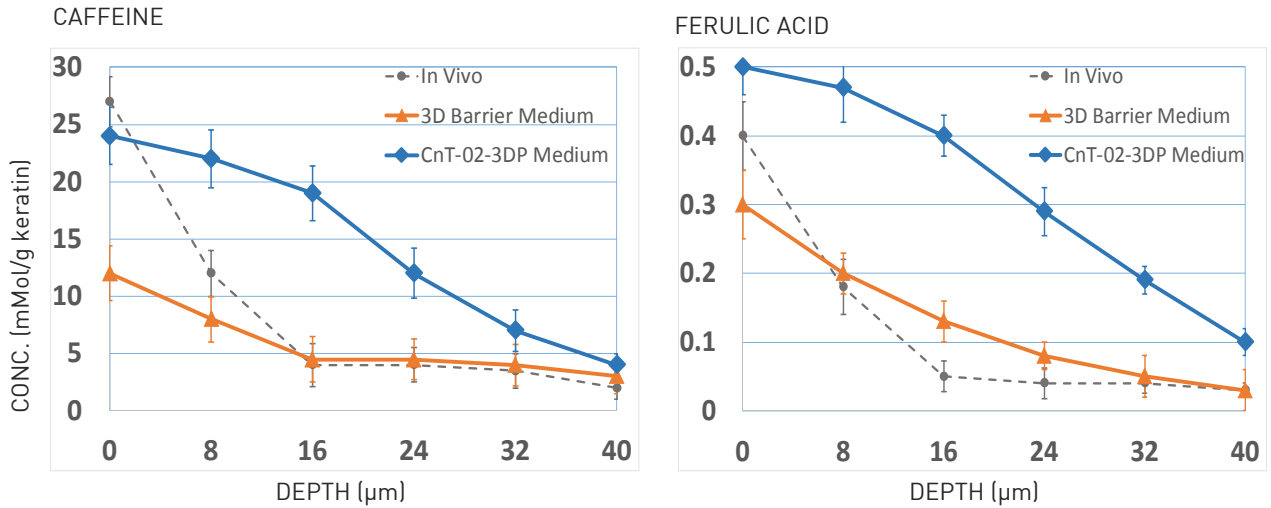
The 3D Barrier Medium improves barrier function by delivering more complete differentiation, and improved formation of lipid structures in the cornified layers.

Testing with a hydrophilic compound (caffeine in water) and a more lipophilic compound (ferulic acid in 50% ethanol) using raman spectroscopy has has shown that this approach significantly improves the barrier function over the previous CnT-02-3DP medium.

The raman profiles for each test chemical show a clear reduction in penetration (see page 2).

The in vivo penetration profiles for the test chemicals are also included. These values fall in a similar range to the models established with the 3D Barrier medium. However they were obtained following application of 25 uL of test chemical solution (vs 50 uL applied to the in vitro models), and so the in vivo barrier was challenged with a lower amount of each chemical.

(results follow on P2).



Concentration of caffeine (left) or ferulic acid (right) at different depths within the epidermis, measured by raman spectroscopy.

3D epidermal models established with 3D Barrier medium showed significantly lower concentrations at all depths.

Epidermal penetration in vivo shown for comparison (measured using reduced volume of test chemical solution).