

Evaluation of skin absorption of caffeine using skin-on-a-chip device and conventional Franz diffusion cell techniques

The most widely used, gold standard method for in vitro/ex vivo drug penetration testing and the optimization of its delivery through the dermal barrier is the Franz diffusion cell system. There are a various types of this equipment (vertical, horizontal, static, flow through, etc.) but data are not consistent and not fully comparable, furthermore a large size of skin surface or membranes and the high amount of test drug formulations are substantial requirements for these methods.

Caffeine as a hydrophilic model drug in pharmacological and cosmetological studies is well documented. Its beneficial effects at topical administration were described in several articles in the last decade.

The aim of our study was to develop a novel miniaturized microfluidic diffusion cell set up („ skin-on-a-chip microfluidic device), skin permeability and dermal absorption of caffeine in various skin preparations and the comparison of the drug absorption of caffeine using both, traditional and recently developed ex vivo techniques.