
# Séminaire de l'axe Formulation et analyse du médicament

## Microarray Patches for High-dose Drug Delivery : Targeting Global Healthcare Challenges

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à l'invitation du professeur Davide Brambilla

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This presentation describes production of unique microneedle array patches prepared from crosslinked poly(methylvinylether-co-maleic acid) which contain no drug themselves. Instead, they rapidly take up skin interstitial fluid upon skin insertion to form continuous, unblockable, hydrogel conduits from attached patch-type drug reservoirs to the dermal microcirculation. Importantly, such microneedles, which can be fabricated in a wide range of patch sizes and microneedle geometries, can be easily sterilised, resist hole closure while in place and are removed completely intact from the skin. Delivery of macromolecules is no longer limited to what can be loaded into the microneedles themselves and transdermal drug delivery is now controlled by the crosslink density of the hydrogel system rather than the stratum corneum, while electrically-modulated delivery and the potential for minimally-invasive extraction of skin interstitial fluid for monitoring purposes are also unique features. This technology has the potential to overcome the limitations of conventional microneedle designs and greatly increase the range of type of drug deliverable transdermally, with ensuing benefits for industry, healthcare providers and, ultimately, patients.

A second important technology to be described here is high dose dissolving microneedles, used to deliver long-acting nanoparticles into the viable skin layers for sustained administration of clinically-relevant doses over weeks or months. This technology has clear utility in prevention and treatment of HIV, contraception and management of schizophrenia, amongst several other indications.