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Labskin to assess drug penetration with different drug formulations

OBJECTIVE

To assess whether the addition of a penetration enhancer to a product formulation containing terbinafine will increase terbinafine penetration into Labskin using Matrix Assisted Laser Desorption Ionisation Mass Spectrometry Imaging (MALDI-MSI).

METHODS

- Labskin was treated with terbinafine hydrochloride (5 mg/mL) in actone/olive oil (80:20 v/v) with or without a penetration enhancer for 24 hours
- Samples flash frozen ready for mass spectrometry imaging
- Frozen samples were sectioned (10 µm), coated with MALDI matrix (a-cyano-4-hydroxycinnamic acid) and analysed for *m/z* ratios associated with terbinafine (*m/z* 292.2 and *m/z* 141)

RESULTS

There was increased Terbinafine in the Labskin with the addition of the penetration enhancer in the production formulation.

Figure 1 - Sections of Labskin treated with Terbinafine without (Tissue 1) or with (Tissue 2) a penetration enhancer

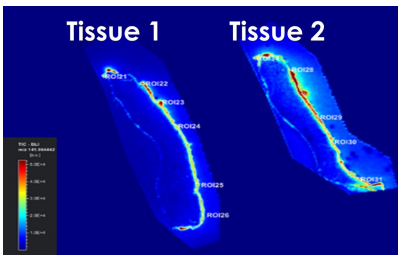
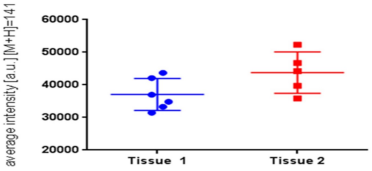


Figure 2 - Graph showing intensity data for terbinafine in Labskin without (3.41± 0.61mg/g of tissue) or with (4.2 ± 0.813 mg/g of tissue) the penetration enhancer

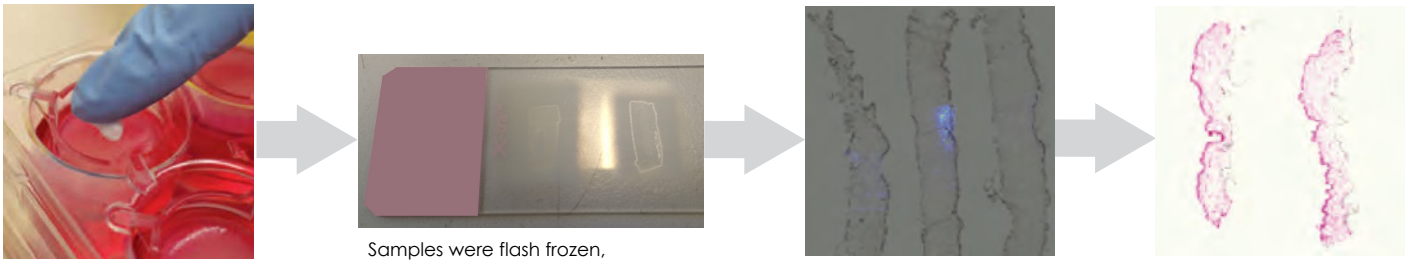


SUMMARY

The combination of MALDI-MSI with Labskin can be used to assess and quantify the penetration of ingredients and formulations against products of recognised activity over time.

ACKNOWLEDGEMENTS - Worked conducted by C. Russo, Sheffield Hallam University, UK

Schematic Representation of the Mass Spectrometry Imaging Workflow



Labskin was incubated with product for the assessed time period

Samples were flash frozen, cryosectioned, mounted onto slides and coated with MALDI matrix

Collated mass spectra was analysed to create mass spectrometry images

Sample can be re-imaged by conventional techniques after MS analysis

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labskin