Improving Compound Extraction Efficiency using the Precellys24

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CONTEXT

Determining the skin penetration profile of active pharmaceutical ingredients present in creams, gels, lotions, and ointments is an important aspect of preclinical dermatological research and key to optimizing the selection of formulation prototypes. The aim of this study is to evaluate the use of a high throughput, automated method versus a traditional liquid extraction (LE) technique to extract compounds of interest from skin tissues in a more efficient manner for downstream LC-MS/MS analysis [1].

RESULTS

The dermis and epidermis values were compared between the three different extraction methods. The five minute Precellys homogenization procedure showed increased extraction of compound SB-275833 from the dermis samples for all three formulations compared to LE (Figure 1A). For epidermis samples, similarly higher extraction was observed for formulations B and C (Figure 1B).

MATERIAL

- Precellys®24 Homogenizer
- Precellys lysing kit: MK25-R, 2mL (KT03961-1-008.2) for use with a Biocap® decapper
- Samples: Deramatomed human abdominal skin (1.5 cm², 500 µm thickness, and <300 mg) after a 6-hr skin penetration study
- Solvent: 500 µL of 1:1 methanol:water + 1% formic acid

PROTOCOL

- Precellys24: 6500 rpm, 1x30 sec (epidermis) and 6500 rpm, 2x60 sec each, 30 sec pause (dermis)
- Implemented automation methods by using a decapper, customized tubes, and liquid handling for sample preparation prior to LC-MS/MS
  - LE: Samples placed in glass vials with 8mL of solvent were incubated for 15 or 48 hours before LC-MS/MS analysis.


CONCLUSION

The Precellys24 homogenizer enhances the high-throughput screening of topical formulations by significantly decreasing the sample processing time and volume of solvent used and increasing extraction efficiency. The incorporation of automation methodology (Precellys tubes customized to fit into a decapper) is ideal for processing hundreds of samples/study.

For more details, please contact precellys@bertin.fr

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