THE USE OF UHPLC COUPLED TO SINGLE QUAD MS DETECTION IN FRANZ DIFFUSION CELL METHODOLOGIES

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INTRODUCTION and OBJECTIVES

- Ultraviolet/visible (UV/VIS) detector
  - High detection limits
  - Lack of selectivity: co-eluting compounds having similar structures and UV spectra

- Single quad MS detector
  - Easy to use
  - Increased efficiency
  - Additional detection possibilities compared to UV/VIS
  - Scan selected mass range
  - Single ion monitoring (SIM)
  - Identification and quantification of compounds

- Quantification biologically active compounds in plant extracts
- In cosmetics for topical use

- Anacyclus pyrethrum plant extract containing the N-alkylamides (NAAs) pellitorine and anacycline

- Spilanthes acmella plant extract containing the NAA spilanthol

- Investigation transdermal behavior of N-alkylamides using in vitro Franz diffusion cell (FDC) experiment
- Quantification with UHPLC coupled to single quad MS detector

EXPERIMENTAL

- Investigation transdermal behaviour of N-alkylamides using in vitro FDC experiment [1]
- Human skin
- Samples analysed with UHPLC-single quad MS/UV

- Anacyclus pyrethrum extract
  - Split 1/10 MS/UV
  - SIM pellitorine (m/z 224.36)
  - SIM anacycline (m/z 272.40)
  - UV 258 nm

- Calculation skin parameters:
  - Permeability coefficient (Kp), lag time (tlag), flux (Jm), percentage penetrated after 1 day (Q1d)

RESULTS and DISCUSSION

1. Transdermal results

   B) Lower LoQ values \( \rightarrow \) better estimation of experimental \( t_{lag} \)

2. Advantages single quad MS compared to UV

   A) Quantification possible without baseline separation in UV

CONCLUSIONS

- Quantification of different NAAs in plant extracts possible with UHPLC-single quad, even without baseline separation \( \rightarrow \) better selectivity (versus UV)
- Low LoQ values are obtained with single quad MS \( \rightarrow \) better estimation of lag time (versus UV)

REFERENCES