HUMAN SKIN KINETICS OF CYCLIC DEPSIPEPTIDE MYCOTOXINS

Lien Taevernier1, Lieselotte Veryser1, Nathalie Roche2 and Bart De Spiegeleer1,∗

1 Drug Quality and Registration (DruQuaR) group, Faculty of Pharmaceutical Sciences, Ghent University, Ottergemsesteenweg 460, B-9000 Gent, Belgium.
2 Department of Plastic and Reconstructive Surgery, University Hospital Ghent, De Pintelaan 135, B-9000 Gent, Belgium.

∗ Corresponding author: bart.despiegeleer@ugent.be (O. Ref.: 2014-316c)

INTRODUCTION

1. HUMAN SKIN KINETICS

Static in-vitro Franz diffusion cells
Intact vs. superficially damaged (tape-stripped 20x) skin
Receptor fluid: 1% HPBCD in PBS
Donor solution: 1 mg/mL in 60:40 EtOH/H2O (V/V)
Quantification with UHPLC-MS/MS (MRM)

RESULTS AND DISCUSSION

1. HUMAN SKIN KINETICS

a) Intact vs. damaged skin

Enniatin B

Beauvericin

Table 1: Permeability coefficients (mean ± SEM, n = 3 – 11).

b) In-silico Kp comparison

Figure 1: Cumulative amount (ng) vs. time (h) curves for ENN B (left) and BEA (right).

Figure 2: Comparison experimentally determined and in-silico calculated Kp’s.

Figure 3: Normalised (1 mg/mL application) skin concentrations (epidermis + dermis).

2. RISK ASSESSMENT AFTER DERMAL EXPOSURE

a) Local skin effects
Locally found skin concentrations compared to literature data → possible epidermal apoptosis, immunological disorders.

b) Systemic effects
Scenario (1st approximation): industrial exposure to contaminated fruit/nuts:
1) Mycotoxin exposure concentration [MT]: based on reported literature
2) Estimation of TDI = 5 µg/(kg BW · day); using NOAEL from limited literature data
3) Calculation of DDEs using our experimental determined Kp’s

Table 2: Non-genotoxic vs. genotoxic estimated DDE’s (µg/(kg BW · day)).

TDI > DDE’s → no acute systemic toxicity risk for industrial food related workers.

CONCLUSIONS

REFERENCES