COMPARISON OF PHYSICO-CHEMICAL PROPERTIES OF HUMAN NAIL AND BOVINE HOOF

Sara Nicoll1, Cristina Padula1, Sudax Murdan2, Patrizia Santi1
1Department of Pharmacy, University of Parma, Italy
2The School of Pharmacy, University of London, WC1N 1AX, UK

INTRODUCTION

Bovine hoof membranes are currently used as a model for the human nail (1), due to the limited availability of nail plates and the similarities between the two structures. In fact, both are keratinic tissues where keratins exist predominantly in an α-helical conformation (2). In addition, hoof membranes have been shown to be suitable models for nail plates in transungual permeation experiments (3).

Purposes of this work are:

- To characterize human nail and bovine hoof membrane in terms of permeselectivity, in view of the application of transungual iontophoresis.
- To measure human nail and bovine hoof membrane swelling capacity, and partition of two model compounds (caffeine and propylparaben).

METHODOLOGY

RESULTS

The partition of caffeine and propylparaben was similar in the case of bovine hoof membrane and human nail

NAIL AND HOOF SWELLING

The nail/hoof swelling was measured after 6 days of immersion in distilled water, as percent weight increase.

CONCLUSION

- Bovine hoof and human nail are characterised by the same isoelectric point and both are negatively charged at physiological pH.
- Bovine hoof and human nail are characterised by a similar partition of caffeine and propylparaben.
- The swelling capacity of bovine hoof membrane was slightly higher than that of human nail.

REFERENCES