

# Enhanced Transport of Patent Blue Dye Through the Stratum Corneum using Green Skin Pore Electroporator

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## SUMMARY

Electroporation is one of the physical enhancement methods showing potential in intra- and transdermal drug delivery. Electric pulses applied externally on skin cause a significant increase in the electrical conductivity and permeability of the stratum corneum (SC) due to the creation of aqueous pores in the SC [1].

The aim of the study was to assess the ability of a Green Skin Pore electroporator device to enhance Patent Blue transport through the SC.

Fresh full-thickness pig ear skin was used for the experiment. Before pulse delivery, a patch with 100  $\mu$ l of 2.5 % Patent Blue solution was placed on the skin for 5 min. After treatment, the patch was applied for another 15 min. Electric pulses were delivered with a Green Skin Pore electroporator through newly developed electrodes manufactured by Iskra Medical d.o.o, Slovenia (Figure 1). The pulses used for skin electroporation were 200 V, 100  $\mu$ s length, delivered continuously for 30 seconds. Peak current during the pulses measured using a digital oscilloscope was  $\sim$ 20 mA.



Fig.1: Green Skin Pore electroporator with external spring-loaded pin electrodes (Iskra Medical d.o.o., Slovenia).

After the treatment with the Green Skin Pore electroporator, histological sections of skin samples were prepared in order to determine the location of Patent Blue and assess the efficacy of intradermal delivery. All pictures were recorded with the same microscope under 10-fold magnification. Comparison between treated (Fig. 2) and untreated skin – passive diffusion (Fig. 3) clearly shows Patent Blue influx into deeper skin layers of the treated sample.

Our results show that treatment of skin with the Green Skin Pore device increases molecular transport into the skin.

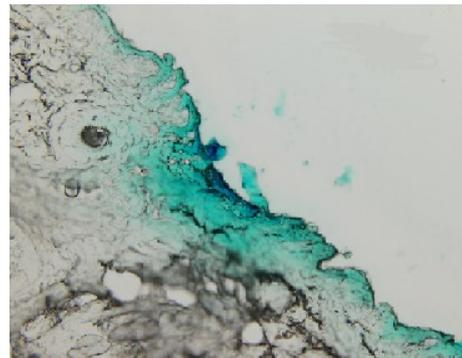


Fig. 2: 10-fold magnification of the histological section of treated skin after electroporation.

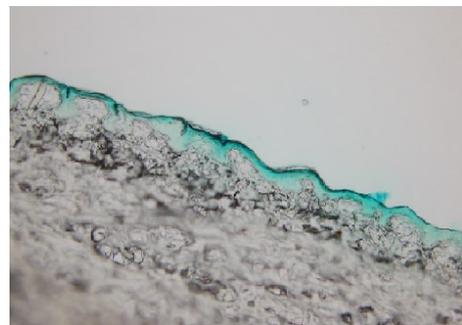


Fig. 3: 10-fold magnification of the histological section of a skin sample after passive diffusion.

**Acknowledgment:** This research was carried out in a collaboration with the EU regional **Competency Center for Biomedical Engineering (www.bmecenter.com)**, coordinated by the Laser and Health Academy (www.laserandhealthacademy.com), and partially supported by the European Regional Development Fund and the Slovenian government.

## REFERENCES

1. Williams AC. Transdermal and Topical Drug Delivery: From Theory to Clinical Practice. 1st ed. Pharmaceutical Press; 2004.

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