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Preface

Human skin – the medium of touch

Since the beginning of mankind the skin has always played a special role as barrier between the outer macro cosmos and the inner micro cosmos by separating the universe from the even more mysterious organs within the body. Also since ever the skin was recognized as the true mirror of the age of a human being and since the oldest preserved documents of arts in medicine it has been tried to retard the aging process of the skin and to look young forever. Nothing has changed with respect to these efforts in nowadays time.

The skin is the largest organ of our body and besides the function as barrier preventing the body from getting dried out and contaminated form outside with exotoxins as microorganisms it has many other biological functions as controlling and regulating body temperature and to act as sensory organ for external stimuli. Even more the skin is also a synthesizing organ under influence of light for important vitamins.

In order to function properly the skin has to be continuously regenerated and by this demand it has a unique structure with a transition from living cells (the stratum basale) to the outermost layer (the stratum corneum), which basically consists of dead layers of corneocytes embedded in sophistically constructed skin lipids. As barrier layer to the environment the skin is also the target of many physical and chemical attacks and many skin diseases are prone to medical treatment but it is also very sensitive to stress and psychological factors. Even more the skin is also part of our immune system and especially due to increasing pollution and availability of exotoxins and increased exposure to UV light the skin reacts by an increasing occurrence of allergic reactions and cancer.

The papers of this theme issue are the proceedings of a conference entitled, ''Human Skin – The Medium of Touch'' which was held in St. Rémy de Provence in France on June 13–15, 2002 under the auspices of Gattefossé. The goal of that conference was to discuss and to critique, in a multidisciplinary forum the state of the art, novel insights, and possibilities under 3 headings: 1. Skin Structure and Biology, 2. Novel Carrier Systems and Transport Routes, and 3. New Aspects in Skin Care.

The proceedings are organized in the same way. In the first part Menon gave his views on the outermost barrier of the skin, the stratum corneum, which has morphed from the classical view of ''brick-and-mortar''organization to that of a composite biopolymer, a smart material with intelligent responses – the biological equivalent of a computer interface that responds to much more than touch. Almost everything that touches this smart package evokes a signal that brings out a response in the body. The complex nature of the signaling (ionic, cytokines, sensory, immunologic, etc) continues to remain an active area of investigation. Ponec gave an review about skin constructs for replacement of skin tissues and her conclusions are that human skin equivalents represent a promising tool for studying the effect of various extrinsic factors. However, the wide spread use of this model is hampered by lack of standardization of both in vivo and in vivo tests to establish to which extent the in vitro outcome can predict the in vivo situation in humans. In the second part Barry concentrated in his presentation on novel approaches of drug delivery routes in skin and mainly focussed on the specific role of hair follicles in transdermal delivery and presenting a new technique using human abdominal skin to explore the role of the appendage route in skin delivery. Bouwstra and coworkers presented their new results on

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elastic vesicles and their interaction with human skin and their ability as carrier for transdermal drug transport. The question whether or not also elastic vesicles intactly can penetrate human stratum corneum still remains open for debate but the current insight is that the elastic vesicles can act as permeation enhancing carriers by an extremely fast partitioning of the vesicles into the stratum corneum, after which the drug is released and can permeate to deeper layers in the skin to reach the systemic circulation. Junginger showed the possibilities of using transdermal iontophoresis as promising route of delivering hydrophilic compounds across the skin barrier. He highlighted the in vitro and in vivo results in Parkinson patients using apomorphine as drug substance. In a first in vivo study (sub)-therapeutic apomorphine levels could be reached. Transdermal iontophoresis also opens in this disease the possibility to achieve apomorphine input ''on-demand'' when disease parameters as shaking or stiffness are monitored by suitable sensor chips (closed-loop system). Finally Kreilgaard showed the influence of microemulsions on cutaneous bioequivalence as assessed by microdialysis. The developed model allows detailed analysis of dermal drug delivery and improvement of various microemulsion systems.

In the third part Denda presents new strategies to improve skin barrier homeostasis. From his paper it becomes evident that skin damage repair is influenced and slowed down by psychological stress factors and he could show that the delay of the barrier repair induced by psychological stress is blocked by a glucocorticoid receptor antagonist. However, reduction of stress by a specific odorant that has a sedative effect, also improved skin barrier homeostasis. Müller and coworkers demonstrated the versatile useability of solid lipid nanoparticles in cosmetic and dermatogical preparations. The latest developments are improved carrier processing methods and so-called ''nanostructured lipid carriers''. This nanostructure leads to inceased loading efficiency with active compounds and increased physical and chemical stability during the shelf life of the product. Schulz discussed distribution of sunscreens on skin and showed optimized formulations with high sun protection by the combination of soluble organic UV absorbers and micronized pigments as titanium dioxide and zinc oxide. Especially these micronized pigments remaining on top of skin are recognized to be highly safe and effective under usage conditions.

In the final discussion of the workshop it became clear that a lot of knowledge exists and has been generated in the last years. However, still shortcomings exist in optimal usage of the skin as delivery organs of drugs for topical and systemic treatment of the skin and Gattefossé is encouraged to continue with those workshops especially on skin because it still remains the medium of touch.

Hans E. Junginger
(Theme Editor)

Division of Pharmaceutical Technology of Leiden/Amsterdam Center for Drug Research
Leiden University
Gorlaeus Laboratory, P.O. Box 9502
2300 RA Leiden
The Netherlands
E-mail: junginge@chem.leidenuniv.nl