

Courage + Khazaka electronic GmbH
Mathias-Brüggen-Str.91 • D-50829 Köln
Phone ++49 221 9564990 • Fax ++49 221 956499-1•
E-Mail info@courage-khazaka.de • Website: www.courage-khazaka.de

STUDIES LIST BIOKIT

G. Pierard, La biopsie de surface en dermatology clinique et expérimentale, Rev. Eur. Dermatol. MST 1992 4 455

La biopsie de surface consiste à prélever la partie superficielle de la couche cornée. Il en existe deux variantes. L'une est réalisée avec l'aide d'une colle de type cyanoacrylate et une lamelle de plastique transparent. L'autre repose sur l'utilisation de petits disques préencollés disponibles commercialement.

C. Pierard, G. Pierard, Cyanoacrylate Skin Surface Stripping for Visualizing Stratum Corneum Structures and Dynamics,

Cyanoacrylate skin stripping (CSSS) came into existence when High-bond glues became available. The introduction of the polyethylene slide used to take the sample was a decisive new stage in the development of this technique. The necessary materials are presented in Table 7.1.

R. Dawber, Skin Surface Biopsy and the Follicular Cast, CRC Press 1995, chapter 5.5, pp. 121-123.

The technique of skin surface biopsy (SSB) was first described by Marks and Dawber. It is a simple, non-invasive method, removing only dead tissue, used to study the stratum corneum as a cohesive membrane, its constituent corneocytes and their relationship to each other, the many types of pathology within this compartment, and a vast array of microorganisms that may colonize or invade the layer.

G. Pierard, EEMCO guidance for the assessment of dry skin(xerosis) and ichthyosis: evaluation by stratum corneum strippings, Skin Research and Technology 1996; 2; 3-11

Evaluation of scaliness in xerotic and ichthyotic conditions is conveniently addressed by stratum corneum strippings. The assessment of scaling conditions by stratum corneum stripping methods may be validly used in the laboratory. Interpretations, however, must be cautious. Direct extrapolations with respect to the water content in the stratum corneum should be avoided.

Richard Marks, A Deeper Look Into The Superficial Layers Of The Skin, Retinoids Today and Tomorrow 1996, Issue 43.

The boundary of self from non-self is defined by the outermost part of the skin. It provides the chemical barrier that grudgingly permits the egress of water and impedes the penetration of microbes, xenobiotics and other antigens.

A. Pagnoni, A. M. Kligman, T. Stoudemayer, Image Analysis of Cyanoacrylate Follicular Biopsies, CRC Press, chapter 9, pp. 113-119, 1997.

The cyanoacrylate follicular biopsy (CFB) is the most reliable tool to sample the follicular contents of facial skin. In 1971, Marks and Dawber introduced the cyanoacrylate "skin surface biopsy" to study the stratum corneum. This polymer removes the outermost horny layer as a sheet.

They showed how this quick and convenient method could be used to examine the glyphic pattern, to search for fungi, or to study diseases in which the stratum corneum is prominently involved.

*Eva-Maria Röpke, W. Augustin, H. Gollnick, **Lipidbestimmung der Hautoberfläche mittels Cyanoacrylattechnik...***, Kosmetische Medizin Vol. 18, 2; 1997, pp. 130-134.

Epidermale und Sebumlipide sind ein permanentes Untersuchungsgebiet in Studien über Akne und die Barrierefunktion der Haut. Unser Ziel war es, eine Methode zur Anwendung zu bringen, die einerseits eine nichtinvasive Probengewinnung beinhaltet, das heißt, die den Patienten möglichst wenig belastet und andererseits schnell und unkompliziert auszuführen ist.

*J.E. Arrese, P. Pierard- Franchimont, G. E. Piérard, V. Goffin, **Biometry applied to cyanoacrylate skin surface strippings. A review of the Liège experience***, Dermatologia Clinica n. 3/ 1999, pp. 93-97.

The cyanoacrylate skin surface stripping (CSSS) is a time-honoured method to harvest in a single procedure a sheet of the superficial stratum corneum and follicular casts as well. Such sampling is currently used to assess non-invasively various physiological and pathological aspects of the skin .

*C. Pierard, G. Pierard, **Skin surface stripping in diagnosing and monitoring inflammatory Xerotic, and Neoplastic Diseases***, Pediatric Dermatology Vol. 2 No. 3 180-184, 2000.

Skin surface stripping is a useful and simple diagnostic tool for the diagnosis of a number of diseases that affect the skin during childhood and adolescence. The procedure has proved to be especially valuable in inflammatory, xerotic, and neoplastic conditions as it provides information regarding pathologic changes as well as diagnosis.

*Pierre Agache, H. I. Maibach, **Physiologie De La Peau Et Explorations Fonctionelles Cutanées***, Editions Médicales Internationales, Cachan cedex, August 2002.

La biopsie de surface a vu le jour lorsque des colles au cyanoacrylate sont devenues disponibles [1, 2]. L'utilisation d'une lamelle en polyéthylène comme support du prélèvement fut une nouvelle étape décisive au développement de cette technique [3].

*J.E. Arrese, P. Quatresooz, P. Pierard- Franchimont, et. al., **Indications diagnostiques de la biopsie de surface au cyanoacrylate***, Dermatologie Aktualité, No. 83, June-July 2004

La biopsie de surface au cyanoacrylate consiste à prélever la partie superficielle de la couche cornée. La méthode est non invasive et habituellement indolore. Elle peut être répétitive au même site. Dans le domaine de la dermatologie clinique, les indications de ce type de prélèvement sont multiples. Elles concernent principalement le diagnostic des dermatites inflammatoires squameuses, des infections et parasitoses superficielles, ainsi que des tumeurs pigmentaires.

*R. Marks, **Seeing Through the Stratum Corneum***, study on the new Biopsie method Biokit®, Courage+Khazaka electronic GmbH, Cologne, Germany.

The stratum corneum (SC) provides a vital barrier membrane dividing the potentially injurious external environment from the vulnerable and metabolically constant internal tissues of the skin. It impedes the flow of water across the skin restricting the normal loss of water to 0.5l/day – the so called normal transepidermal water loss (TEWL).

*R. Marks, G. Khazaka, **Diagnostik an der Grenzfläche: Hinweise zur Hautoberflächenbiopsie***, 16. DGK-Symposium 2004, Köln, Posterpresentation.

Das Stratum Corneum (SC) blieb bis heute von den Dermatologen und Hautbiologen nahezu unbeachtet. Diese mangelnde Aufmerksamkeit besteht weiter, obwohl mittlerweile erkannt wurde, dass die Struktur eine lebenswichtige Rolle in der Aufrechterhaltung einer konstanten, inneren physiologischen Umgebung spielt.

*R. Marks, **Diagnostic Clues At The Interface, Poster presentation***, DGK Symposium Leipzig, 02.-04.03.2005.

The stratum corneum (SC) has been comparatively ignored by dermatologists and skin biologists. This lack of attention still persists despite the recognition that the structure plays a vital role in maintaining the constancy of the internal physiological environment. It is the barrier properties that give the SC its central role in skin physiology.

C. Piérard-Franchimont, V. Goffin, G. E. Piérard, Indaguer la couche cornée. Biométrie par la biopsie de surface au cyanoacrylate, *Dermatologie Actualité*, 87, pp. 23-26, 2005. *

La biopsie de surface au cyanoacrylate est un outil diagnostique précieux (1-3). Elle trouve aussi son utilité en dermatologie expérimentale, lorsque la couche cornée exprime certaines propriétés quantifiables (4). Nous rapportons ici un bref synopsis des méthodes qui ont vu le jour ces 20 dernières années.

G. E. Piérard, Cyanoacrylate biopsy for cytologic evaluation of the epidermis, Department of Dermatopathology, University Hospital Sart Tilman, Liège, Belgium.

Cyanoacrylate skin surface stripping (CSSS) is a time-honoured method. After its clever discovery, it was soon applied for diagnostic purposes. Sampling on polyethylene slide was a decisive improvement in the development of this method.

G. W. Nam, S. H. Kim, E. J. Kim, J. H. Kim, B. G. Chae, H. K. Lee, How Skincare Ingredient Concentrations Can Modulate the Effect of Polyols and Oils on Skin Moisturization and Skin Surface Roughness, *IFSCC Magazine*, Vol. 9, No. 1 2006.

The aim of this study was to evaluate the influence of different skincare ingredient concentrations on the effect of polyols and oils on human skin moisturization and skin surface roughness. Polyols and oils are essential ingredients in a skin care formulation, but it is still not understood how their concentrations affect their efficacy and sensory properties on human skin.

Sparavigna, A. Di Pietro, M. Setaro, Sensitive skin: correlation with skin surface microrelief appearance, *Skin Research and Technology* 2006: 12, pp. 7-10.

Sensitive skin has been defined as a condition associated with reduced cutaneous tolerance to environmental factors, such as cold, heat and wind, and/or frequent or prolonged applications of some topical products, such as cosmetics.

André Rougier, Gerald Pierard, Nudging acne by topical beta-lipohydroxy acid (LHA), a new comedolytic agent, *AB15 J AM ACAD DERMATOL*

Beta-lipohydroxy acid (LHA) is a lipophilic derivative of salicylic acid. It exhibits a potent keratolytic effect caused by the dissociation of the comedodesmosomes in the outmost layers of the stratum corneum. In addition, topical applications of a 2% LHA formulation increased the thickness of the epidermal germinative layers, stratum malpighi, and filaggrin layer.

Pascale Quatresooz, Emmanuelle Xhaufaire-Uhoda, Claudine Piérard-Franchimont, Gérald E. Piérard, Regional variability in stratum corneum reactivity to antiseptic formulations, *Contact Dermatitis* 2007; 56; pp. 271-273

Skin does not react in an identical way to the action of chemicals over all anatomic sites. Accordingly, distinct regional differences have been described in relation to irritancy. The present study assesses the regional variations of stratum corneum (SC) reactivity to 3 proprietary antiseptic solutions.

Electronically av.

Dr J. E. Arrese, Dr P. Quatresooz, Pr C. Piérard-Franchimont et Pr E. Piérard
Service de Dermatopathologie, CHU du Sart Tilman, Liège

Indications diagnostiques de la biopsie de surface au cyanoacrylate.

L'avènement du 3S-Biokit

Résumé La biopsie de surface au cyanoacrylate consiste à prélever la partie superficielle de la couche cornée. La méthode est non invasive et habituellement indolore. Elle peut être répétitive au même site. Dans le domaine de la dermatologie clinique, les indications de ce type de prélèvement sont multiples.

Elles concernent principalement le diagnostic des dermatites inflammatoires squameuses, des infections et parasitoses superficielles, ainsi que destumeurs pigmentaires.

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Hinweise zur Schnittstellendiagnostik Einführung Das Stratum corneum (SC) blieb bis heute von den Dermatologen und Hautbiologen nahezu unbeachtet. Diese mangelnde Aufmerksamkeit besteht weiter, obwohl mittlerweile erkannt wurde, dass die Struktur eine lebenswichtige Rolle in der Aufrechterhaltung einer konstanten, inneren physiologischen Umgebung spielt. Es ist die Barriere-Eigenschaft, die dem SC eine zentrale Rolle in der Hautphysiologie verleiht. Gesunde verlieren ca. 0.5l Wasser pro Tag über das SC (Schweiß ist dabei nicht eingerechnet) – der sogenannte transepidermale Wasserverlust (TEWL). Bei gravierenden Schäden wie bei Verbrennungen oder Psoriasis können bis zur zehnfachen Menge, d.h. bis 5 l Wasser pro Tag verloren gehen, was zu lebensbedrohlicher Dehydrierung führen kann. Das SC erschwert ebenfalls den Eintritt von Xenobiotika in den Körper und schützt so vor Problemen durch Kontakt mit toxischen Substanzen. Zusätzlich verhindert das SC auch das Eindringen pathogener Mikroorganismen in den Körper und schützt uns teilweise gegen die Sonnenbestrahlung, thermische Schäden und geringe mechanische Traumata.

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Indaguer la couche cornée. Biométrie par la biopsie de surface au cyanoacrylate.

Claudine Piérard-Franchimont, Véronique Goffin et Gérald E. Piérard
Service de Dermatopathologie, CHU du Sart Tilman, Liège

La biopsie de surface au cyanoacrylate est un outil diagnostique précieux (1-3).

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Diagnostic Clues At The InterfaceR. MarksDiagnostic Clues At The Interface Introduction

The stratum corneum (SC) has been comparatively ignored by dermatologists and skin biologists. This lack of attention still persists despite the recognition that the structure plays a vital role in maintaining the constancy of the internal physiological environment. It is its barrier properties that give the SC its central role in skin physiology. In health we lose about 0.5l of H₂O per day across the SC (excluding sweat) – the so called transepidermal water loss (TEWL). When seriously damaged such as in burns or from psoriasis we can lose up to 10 times as much – 5l, per day rapidly producing life threatening dehydration.

G. Piérard, P. Quatresooz; Corneoxenometry: a stratum corneum toxicity model; ISBS Besancon 2009;

Predicting the damaging effects of peeling agents on human stratum corneum is hazardous in conditions close to the in vivo situation. Comparisons between the effects of different compounds or different concentrations of a given compound may prove to be difficult to perform. By contrast, the in vitro corneoxenometry bioassay is safe, quite easy to handle and serve to predict some specific effects occurring in clinical practice. The effects of different concentrations of glycolic acid (GA) and those of problematic commercially available phenol formulations were tested using the corneoxenometry bioassay

Dr. med. Dipl.-Biochemiker Hans-Ulrich Jabs; Wet-Peeling mit dem Korneo-Rubber – ein neues Behandlungskonzept bei Barriere- und Verhornungsstörungen; Ästhetische Dermatologie 2 / 2010

Ein gemeinsames Kennzeichen von Hautalterung und von fast allen Hauterkrankungen sind Barriere- und Verhornungsstörungen. Die äußere Schicht der Haut – die Epidermis – besteht hauptsächlich aus Keratinozyten, wenigen Melanozyten und einigen immunkompetenten Zellen (Langerhans Zellen). Die Epidermis ist ein dynamisches System, deren Struktur und Metabolismus zwei Hauptaufgaben haben: Die Haut vor äußeren, schädlichen Einflüssen zu schützen und das Flüssigkeitsgleichgewicht (Hydratation) von inneren Geweben und Organen zu gewährleisten.

C. Piérard-Franchimont, J. Arrese-Estrada, P. Quatresooz, G. E. Piérard; **39 Cyanoacrylate Skin Surface Strippings**; Textbook of Ageing Skin, Springer-Verlag Berlin Heidelberg 2010

In its most widely appreciated context, the stratum corneum (SC) exerts a major barrier function extending to protection from ultraviolet light, microorganisms, oxidants, and other toxic xenobiotics. In addition, it protects from loss of water and electrolytes from the body. Despite limited metabolic activity, the SC is viewed as a highly specialized structure showing continuous renewal keeping ideally a steady state in its structure and thickness.

Christiane Uhl, Diana Khazaka, C+K electronic GmbH; **Techniques for globally approved skin testing**; Personal Care April 2013

In efficacy testing and claim support for cosmetic products, objective measurement systems became indispensable long ago, especially since subjective clinical assessments are often prone to bias and inter-observer variation. Without suitable instrumentation it is close to impossible to determine what a product is really doing for the skin. Those objective measurement methods and subjective evaluations are mutually dependent. No measurement can be performed without the subjective evaluation of the results by the user of such instrumentation. However, a pure subjective evaluation of the skin without appropriate measurement techniques is not able to achieve accurate results either. This relationship becomes clearer when looking for example at skin colour measurements. Subjectively, the human brain cannot process slight changes in colour, especially when the colours are not viewed side by side, but at different points in time. Instrumental measurement however will clearly detect such slight changes. The achieved result must then be interpreted in context with the expected outcome or the hypothesis. For this, you will always need a knowledgeable and experienced person because 'a fool with a tool is still a fool', as the late Albert Kligman used to say. This relationship between objective measurement and subjective evaluation is not only true for the determination of differences in skin colour, but also for all other skin measurement parameters important for the cosmetic industry.

K. Myer, H. Maibach; **Stratum corneum evaluation methods: overview**; Skin Research and Technology 2013; 19; 213-219

Background/purpose: The stratum corneum serves as a main barrier for the skin, minimizing water loss and regulating absorption of substances. Because of its surface location, it is readily available for analysis. Consequently, many techniques are amenable to investigating its content and function. Here, we review the methods employed to evaluate the stratum corneum and its function. Methods: We reviewed Pubmed and Embase search results for 'stratum corneum, 'method, 'methods, 'technique, 'and 'evaluation' and extracted pertinent articles that discussed ways to examine the stratum corneum and its constituents. Results: Traditional and novel methods vary by accuracy, ease of use, time requirements, cost, invasiveness, and equipment requirements.

G.E. Pierard, C. Franchimont, P. Delvenne; **The thousand and one facets of actinic keratosis**; Dermatology Laboratory and Clinical Research, Nova Biomedical; ISBN: 978-1-62808-106-0

Introduction: Actinic (or solar) keratosis (AK) is a common photoinduced neoplasm. It is a biologically benign condition. However, it represents the initial clinical step of a disease continuum observed on chronically photodamaged skin leading to a peculiar type of invasive squamous cell carcinoma (SCC). This cancer has limited metastatic potential [1], and is tentatively more specifically named "actinic carcinoma" (AC). When considering AK, the older terms "senile keratosis" and "senile keratoma" have been abandoned as clinical designations because the age of the individual is not an essential feature.

G.E. Piérard, C. Piérard-Franchimont, P. Delvenne; **Cyanoacrylate Skin Surface/Follicular Stripping**; Non Invasive Diagnostic Techniques in Clinical Dermatology; Springer Berlin Heidelberg 2014; ISBN 978-3-642-32108-5

Introduction: The stratum corneum (SC) is a dead structure. However, it exerts a unique barrier function partly protecting the living tissues from a series of environmental threats including ultraviolet light, microorganisms and irritant/toxic xenobiotics. In addition, the SC controls any excessive loss in water, electrolytes and macromolecules from the skin. In addition, the SC acts as a

unique sophisticated biosensor that signals the underlying epidermis to respond to various external stimuli. Despite minimal metabolic activity, the SC corresponds to a highly specialised structure resulting from the continuous corneocyte renewal ideally keeping a steady state in the SC structure and thickness. However, corneocytes are structurally and biochemically heterogeneous.