International Society for Biophysics and Imaging of the Skin

World Congress, Sept 24-26th, Buenos Aires Argentina
"New Insights on the visible and the invisible skin"

FINAL

SCIENTIFIC PROGRAM

INTERNATIONAL SOCIETY FOR
STRATUM CORNEUM RESEARCH

Buenos Aires, September 2010

Dear Participant, Colleagues and Friends:

I want to personally thank you for being here and give you a warm welcome.
When the ISBS Board decided that Argentina was the next venue for the ISBS World Congress 2010, "New insights on the visible and the invisible skin", and me being its president, was a gratification and also a responsibility that I gladly accepted with all that entitled: organization, resources, synergy of actions to complete this challenge.
With no doubt, the scientific success, the development of new trends in biophysics and imaging of the skin, the knowledge that we will all incorporate to our assets, considering the excellency of our speakers and their topics.
I am pleased to welcome you and want to thank all of those that through hard work, dedication and commitment, devoted themselves to cover all the needs that the event warranted.
Special thanks to my colleague Maite San Miguel, that even at the distance and travelling to Buenos Aires whenever I needed help and shared my concerns without hesitating.
To CLAIM staff that taking hours from their rest period, with big efforts accompanied me and are here today.
To the students of UADE University *(Universidad Argentina de la Empresa)* that as a courtesy of its Principal, could be incorporated to work for free.
To the Consultant that took care of all details of the event until the end.
My greatest appreciation and thanks to my family, that without being experts in my professional background I was given the vital support needed, strength and their comprehension and affection.
Today ISBS 2010 Argentina is a reality
Today everything is done
Today starts the end of the long journey you have done to Buenos Aires,
I thank you for being here, proud that you are participating for the first time of this world congress being held in Latin America. Thank you.

Dr. Silvia Perez Damonte
Chair of the Organizing Committee

Buenos Aires, Septiembre 2010

Estimados participantes, colegas y amigos:

En forma personal quiero darles a todos y a cada uno de ustedes la más cordial bienvenida.
Cuando por elección decidieron que Argentina fuese sede del congreso mundial ISBS 2010 con su tema "nuevas revelaciones de la piel visible e invisible" y yo su presidente, fue una gratificación y a su vez una responsabilidad que gustosa acepté, con todo lo que ello implicaba: organización, recursos, sinergia de acciones para llevar a buen término el desafío.
El éxito científico, el desarrollo de las nuevas tendencias en biofísica e imagenología de la piel, el conocimiento que todos incorporaremos será sin lugar a dudas una realidad, considerando la excelencia de los disertantes y sus temas.
Estoy contenta de recibirlos y por ello mismo debo agradecer a todos los que con esfuerzo, dedicación y compromiso se abocaron a cubrir todas las necesidades que este evento ameritaba.
Especialmente a Maite San Miguel, mi colega que aún a la distancia y viajando toda vez que necesité su ayuda compartió sin dudarlo mis lógicas inquietudes.
A todo el personal de Claim que restando horas a su descanso y con máximo empeño me acompañaron y me acompañan.
A los estudiantes de la UADE (Universidad Argentina de La Empresa) que por cortesía de su rector pudieron ser incorporados para colaborar en forma gratuita.
A la consultora que cuidó y cuidará todos los detalles y recursos hasta el final.
Mi mayor reconocimiento y agradecimiento a mi familia, sin ser expertos en mi terreno profesional me dieron el sustento vital que necesitaba fuerza y como siempre todo su afecto y comprensión.
Hoy la ISBS 2010-Argentina es una realidad.
Hoy está todo hecho.
Hoy empieza el final del largo camino recorrido hasta Buenos Aires.
En forma personal, agradezco su presencia y estoy orgullosa de que estén participando de este evento mundial por primera vez en Latino America
Muchas gracias

Dr. Silvia Perez Damonte
Presidente del Comite Organizador

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Editor	Jørgen Serup, MD, Denmark

INVITED GUEST SPEAKERS

Philippe Humbert, MD, PhD
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- Professor Philippe Humbert, head of Dermatology Department in the University Hospital of Besançon (CHU St Jacques, Franche-Comté, France) is also director of the University research team, Laboratory of Skin Biology and Engineering (LIBC) within the INSERM U645 (National Institute for Health and Medical Research).
- Co-Editor of the book Measuring the Skin, Non-invasive Investigations, Physiology, Normal Constants (Berlin: Springer, 2004)
- President of the ISBS (International Society for Biophysics and Imaging of the Skin). The ISBS was founded in 1976 and consists of more than 180 members, including dermatologists, medical professionals, physiologists, biochemists, all having the same interest for the development, use and dissemination of knowledge in biotechnology of the skin.
- Founding member of the French and french-speaking Society of Skin Engineering (SFIC), which was established in 1999, and which aim is to organize conferences speaking on subjects closely related to the theme of biometrology and *in vivo* imaging of the skin.
- Expert at the French Agency for the safety of Health Products (AFSSAPS).

R. Randall Wickett, Ph.D
(United States)
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- Professor of Pharmaceutics and Cosmetic Science, University of Cincinnati College of Pharmacy: In charge of graduate program in skin pharmaceutics and cosmetic science.
- Vice-president of the Society of Cosmetic Scientists of United States and will be president in 2011
- Scientific advisor of the Romanian Society of Cosmetic Scientists
- Editor: Journal Cosmetic Sciences SCC
- Publications: more than 90, in prestigious scientific magazines related to cosmetic sciences
- Active participation on ISBS (International Society for Biophysics and Imaging of the Skin): former president, scientific coordinator, etc
- Awards and honors:
  - Maison G. de Navarre,1997
  - Society of Cosmetic Chemists Merit Award for distinguished contributions, achievement and service to the Society December 7, 2007

Stephan El Gammal, MD
(Germany)
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- Professor, Head of the Dermatological Clinic (Diakonie Klinikum Bethesda, Freudenberg, Germany), is a specialist in non-invasive imaging techniques in Dermatology. He developed in cooperation with the High Frequency Department of the University of Bochum (Germany) 50 and 100 MHz high-resolution ultrasound systems and was involved in high-resolution magnetic resonance imaging.
- Last President of the International Society for Skin Imaging (ISSI), under his presidency ISSI was fused with ISBS.
- Presently Board member and treasurer of the International Society for Biophysics and Imaging of the Skin (ISBS)
- Co-editor of the book ***Ultrasound and the Skin*** (Springer) and ***Wound Healing and Skin Physiology*** (Springer)
- Scientific fields of interest: non-invasive imaging techniques (sonography, MRI, OCT, Confocal Microscopy), three-dimensional reconstruction methods, automated image analysis (e.g. D-Squame, Sebutapes, wound healing analysis)
- Clinical fields of interest: clinical dermatology, phlebology, oncology, operative dermatology

Enzo Berardesca, MD
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- Director of Clinical Dermatology at the San Gallicano Dermatological Institute, Rome, Italy.
- Graduated from University of Pavia and received the M.D. degree in 1979. He served as resident and dermatologist the Dept. of Dermatology, IRCCS Policlinico S. Matteo, Pavia from 1982 to 1987, as assistant research the Dept. of
- Dermatology, University of California School of Medicine in San Francisco, USA in 1987. From 1988 to 2001 he has been at the Dept. of Dermatology of the University of Pavia, head of the Dermato-allergology Unit and of the Skin Bioengineering Lab.
- Chairman of the ISBS from 1990 to 1996. Has organized several international meetings on skin bioengineering and irritant contact dermatitis in Europe.
- Member of the editorial board of Skin Pharmacology, Skin Research and Technology, The American Journal of Clinical Dermatology and the Journal of Cutaneous and Ocular Toxicology.
- Member of the Society for Investigative Dermatology, the European Society for Dermatological Research, the Italian Group for Research on Contact Dermatitis (GIRDCA), and vice-chairman of the European Group For standardization of Efficacy Measurements of Cosmetics (EEMCO group).
- His current major research interests are irritant dermatitis, barrier function and noninvasive techniques to investigate skin physiology with particular regard to skin color and racial differences in skin function, sensitive skin and efficacy evaluation of topical products.
- Author of 11 books and more than 400 papers and book chapters

Valery Tuchin, MD, PhD
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Professor Valery V. Tuchin holds the Optics and Biophotonics Chair and is a Director of Research-Educational Institute of Optics and Biophotonics at Saratov State University, Head of Laboratory on Laser Diagnostics of Technical and Living Systems, Inst. of Precise Mechanics and Control, RAS. His research interests include biophotonics, biomedical optics and laser medicine, physics of optical and laser measurements. He has authored more than 300 peer-reviewed papers and books, including his latest, *Tissue Optics. Light Scattering Methods and Instrumentation for Medical Diagnosis* (PM166, SPIE Press, second edition, 2007) and *Handbook of Optical Sensing of Glucose in Biological Fluids and Tissues* (CRC Press, Taylor & Francis Group, London, 2009). He has been awarded Honored Science Worker of the Russian Federation and SPIE Fellow; he is a Vice-President of Russian Photobiology Society. In 2007 he was awarded the SPIE Educator Award.

Anthony Rawlings, PhD
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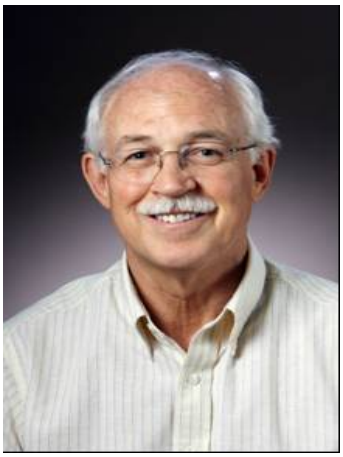
Dr. Rawlings is a leading consultant in the health & beauty industry, where he consults for cosmetic companies, food companies, pharmaceutical companies including wound care & dermal delivery companies, retailers and suppliers on functional skin & hair care technologies. Dr. Rawlings brings over 25 years of experience in R&D, including 22 years of research in skin biology at several senior management levels in Food and Personal care companies in the UK & USA. He is the author/co-author of over 170 papers, book chapters and abstracts and has filed over 50 patents in areas of skin & food science. He has received several literature awards from the *American Academy Of Dermatology, The Society of Cosmetic Chemists,The International Federation Of The Society Of Cosmetic Chemists, the International Society for the Bioengineering of the Skin & the International Journal of Cosmetic Science*. He is a Chief Editor of the International Journal of Cosmetic Science, was the Co-Chair the Gordon Research Conference on Mammalian Barrier Function in 2007 and is co-editor of the first and second edition of 'Skin Moisturization' published in 2009.



Steven Hoath, MD, PhD
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- Dr Hoath graduated from Stanford University and the University of Hamburg, Germany with majors in Biology and German Studies
- He received his MD from the University of California, Los Angeles and completed his Pediatric Residency and Fellowship in Neonatology at UCLA before joining Cincinnati Children's Hospital Medical Center in 1984.
- He is Professor of Pediatrics at the University of Cincinnati and Medical Director of the Skin Sciences Institute.
- Dr Hoath has a longstanding interest in the development of fetal and newborn skin and the multiple roles of the skin as a critical interface for healthcare delivery in the NICU. In addition to basic research, he is an active clinician and teacher focusing on neonatal intensive care, nursing / physician team building and delivery room management of the sick newborn.
- He has authored multiple papers, chapters, and a book on neonatal skin development. He is an inventor on 5 patents awarded to cincinnati Children's Hospital Medical Center based on the biology of the multifunctional fetal skin 'cream', vernix caseosa. Recent work has focused on the logico-mathematical organization of human epidermis and the close embryological connection of the skin and the brain.

Alicia Kowalczuk, MD,
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- Dermatologist, graduated from the Universidad Nacional de Buenos Aires (UBA), Argentina
- Deputy chief of the Dermatological services, Hospital Italiano de Buenos Aires.
- Fomer treasure, secretary, vice president and president of the SADEPA
- Publications: Eur. J. Dermatol. , R. An. Bras. Dermatol. , Journal of the European Academy of Dermatology and Venereology, others.
- Book chapters: family medicine and ambulatory pracxis: Dermatoscopy
- Classes to Medical students of dermatology: histopathology of normal skin, histopathology of elemental lesions, melanomas, syphilis, others
- Awards: two in Colombia and Chile at the XVI CILAD Congreso Ibero-latinoamericano de Dermatología and XXV Reunión Anual de Dermatólogos Latinoamericanos del Cono Sur
- Attended many courses in Argentina and abroad
- Member of the Sociedad Argentina de Dermatología, Asociación Argentina de Dermatología, Sociedad Argentina de Micología, Asociación Médica Argentina, S.A.D.E.P.A., Sociedad de Criocirugía, Colegio Ibero Latino Americano de Dermatología. (C.I.L.A.D.), Sociedad Uruguaya de Sida, American Academy of Dermatology Non Resident Fellow, Societas Internationalis Dermatologiae Tropicalis, Geographicae et Ecologicalis,
- Honorary member of Circulo Dermatologico del Peru

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PostDoc at the Institute for Lasertechnologies in Medicine (ILM), University Ulm
PostDoc at the Beckman Laser Institute and Medical Clinic University of California, Irvine, California, DFG Stipendiat
scientist at the Institute for Molecular Biotechnology (IMB), Jena
scientist at the Institute of Anatomy (cell biology, histology), University Jena
Habilitation in cell biology (Dr. rer. nat. habil.)
Private Lecturer (Privatdozent) at the University Jena
Research Award of the State of Thuringia
Business Award of the State of Thuringia
Foundation of the spin-off company JenLab GmbH (www.jenlab.de)
Robert Feulgen Award
C.A. Kortum Motivation Award of the University Bochum
Director Centor of Lasermicroscopy at the Klinikum, University Jena
CEO JenLab GmbH
C4 professor at the Saarland University, Faculty of Mechatronics/Physics, Saarbrücken
Director of the Dept. Microsystems/Laser Medicine at the Fraunhofer IBMT
Fraunhofer Award Technology in Life Sciences
Award of the Society of Skin Pharmacology and Physiology
SPIE award for laser in ophthalmology
Vice-President of WLT (German Society of Lasertechnology) for Lasers in Life Sciences

More than 200 publications (2x Nature etc)
More than 30 patents
More than 100 invited/plenary talks
Organizer of the 3rd World Congress for Cellular and Molecular Biology (with 8 Nobel Prize winners),
Focus on Microscopy, International Workshops etc.

- Active participation in the ISBS (International Society for Biophysics and Imaging of the Skin)

Silvia Perez Damonte,
PhD (Argentina)
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- PhD in Pharmacy, specialist in cosmetic production, University of Buenos Aires.
- Professor of Cosmetic Dermatology in the School of Pharmacy and Biochemistry, University of Buenos Aires.
- Professor at the AAQC (asociacion argentina de Quimicos cosmeticos)
- CEO of CLAIM, a company devoted to giving advice and evaluating the efficacy and security of cosmetic products and others through the use of sensorial and bioengeeniering methods.
- Publications: in many prestiguious scientific magazines
- Co-author of the books:
  - "Cosmiatria III" 1998
  - "Dermato Estetica" 2005
  - "Dermato Cosmiatria"2008
- General Secretary of the XV Latin American and Iberian Congress of cosmetic chemists, 2001 Buenos Aires
- Ex president (2002-2006)of the AAQC (Asociacion Argentina de Quimicos Cosmeticos)
- Former Secretary of the FELASCC (2005-2008)
- Active participation in the ISBS (International Society for Biophysics and Imaging of the Skin)

PROGRAM SEPTEMBER 24, 2010

time	activity	speaker	country
07:30	registration		
	Pre-congress Workshop (Salon Colonial)	**Bernard Querleux - Silvia Perez Damonte**	
08:30 - 09:00	Skin Mechanics and Surface properties	Dr. Randall Wickett, Ph D.	United States
09:00 - 09:30	Cross-sectional Imaging of the skin	Dr. Stephan El Gammal, MD	Germany
09:30 - 10:00	Hydration, TEWL, Sebum, pH and others	Dr. Enzo Berardesca, MD	Italy
10:00 - 10:30	coffee break pre-congress course (grand Hall)		
10:30 - 12:30	practice and demonstrations with bioengineering instruments (Grand Hall)	all attendees to pre-congress course	
12:30 - 13:00	Skin Color and Digital photography	Dr. Philippe Humbert, MD	France
13:00 - 13:45	cocktail opening ceremony (for full registration members and non members, only)		
14:00 - 14:30	**opening Ceremony and tribute to Dr. Albert Kligman**	**Silvia Perez and ISBS board / Gary Grove**	**Argentina**
	Session 1: Skin and Optics	**Klaus-Peter Wilhelm - Alicia Cannavó**	
14:30 - 15:15	**Skin Optics and Clear Vision through Skin**	**Keynote speaker: Valery Tuchin, MD**	**Russia**
15:15 - 15:30	Improving the calibration of low cost digital dermatoscopes	Paul Wighton, **Tim K. Lee,** Harvey Lui, David I. McLean, M. Stella Atkins	Canada
15:30 - 15:45	Skin texture variation from facial photographs	**David Miller**	United States
15:45 - 16:00	Biometrical Assesment of skin radiance	Jeudy A, Sainthillier JM, Lihoreau T, Mac-Mary S, **Humbert P**	France
16:00 - 16:30	coffee break (grad hall) and posters (salon Colonial)		
	Session 2: Skin studies	**Martha Tate - Patricia López**	
16:30 - 16:45	Laser scanning confocal microscopy: application to cosmetic product assesment	Fernandez E, Poirier F, **Marull S**, Laperdrix C	France
16:45 - 17:00	Objective evaluation of moisturizer effect on skin sensitivity and barrier integrity during continuous insult pressure	**Billhimer W**, Woodford J, Butcher D, Epplen K, Neufarth T, Houston D, Bowman J	United States
17:00 - 17:15	in-vivo assesment if skin wrinkles reduction using optical coherence tomography during treatment with an antiaging product	**Vasquez-Pinto, L.**	Brazil
17:15 - 17:30	Single cel gel electrophoresis or Comet Assay	**Elio Prieto**	Argentina
20:30 - 00:10	Argentinean night, (Salon Dorado and Plaza)	Marriott Plaza	

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IMPROVING THE CALIBRATION OF LOW COST DIGITAL DERMOSCOPES

Paul Wighton[1,2,3], Tim K. Lee[1,2,3], Harvey Lui[2,3], David I. McLean[2], M. Stella Atkins[1]

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Background

The clinical use of 'low-cost' digital dermoscopes, created by attaching a dermoscope to a consumer grade digital camera, is becoming increasingly popular. The nature of such devices poses several challenges. Firstly, the illumination across the field of view is not consistent, resulting in areas of over- and under-exposure within the same image. Secondly, the color of the image acquired is not accurate. These issues have been identified, and calibration methods to address these shortcomings have been proposed. In addition to calibrating for color and lighting, we analyze a distortion effect known as chromatic aberration. Chromatic aberration occurs when the refractive index of the optics is not constant with respect to wavelength. It induces red and blue hues to edges within an image.

Purpose

We present a method that, in addition to calibrating for color and lighting, quantifies and corrects distortions due to chromatic aberration.

Methods

Calibration is achieved by acquiring reference images of a 24 patch color chart as well as a black and white checkered pattern.

The images of the color chart are used to derive the 3x3 'color matrix' of the imaging system. This color matrix is used to correct the color in future images.

The image of the white patch of the color chart is used to derive 'lighting maps' to correct for inconsistencies in lighting across the field of view.

The image of the checkered pattern is used to estimate the distortion field induced by chromatic aberration. Distortions due to chromatic aberration are then

corrected by warping the red and blue channels to align them to the reference (green) channel.
due to chromatic aberration are reduced by approximately 47%.

Results

The method has been validated using 2 imaging systems. Results of color/lighting calibration are consistent with previously published results (ΔE=0.43), while distortions due to chromatic aberration are reduced by approximately 47%.

Conclusions

It is possible to mitigate some of the shortcomings of inexpensive dermoscope components, including distortions due to chromatic aberration which hitherto has not been considered, using a fast and simple calibration procedure.

Key Words

Digital Dermoscopy; Calibration; Color Balancing; Chromatic Aberration; Geometric Distortion

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SKIN TEXTURE VARIATION FROM FACIAL PHOTOGRAPHS

David. L. Miller

The goal of this study was to determine the variation and differences in skin texture presented by different regions of the face. Methodology: Texture was measured from a set of 6 "global" photographic images consisting of 3 views: full face, left and right sides of the face. Each view was photographed in cross-polarized light and parallel polarized light. The images were made on 60 female Caucasian subjects using the VISIA CR Image Station (Canfield Scientific). For each image: circular regions of interest (ROI) of fixed dimensions were placed in the image and their positions adjusted to sample the selected areas: glabellar, eye, cheek and mouth areas. A total of 23 regions were sampled: 3 in the glabellar area, 8 in the eye area, 6 in the cheek and 6 in the mouth. Texture was emphasized in the ROI's by imaging the difference between parallel- and cross-polarized source images. Data collected were texture roughness, mean feature size, total area, and count of detected features. Results: For the most part, there were no differences between the mean parameters for the left and right views of a particular facial area, while for some of the areas, there were significant differences between the full face view and either left or right views. Conclusion: In these images, the full face view produces a very different perspective of skin texture than do the side views. The size of features was most consistent across the areas while the number of features varied the most across the areas.

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BIOMETROLOGICAL ASSESSEMENT OF THE SKIN RADIANCE

Jeudy A*, Sainthillier JM, Lihoreau T*, Mac-Mary S**, Humbert P***

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**Skinexigence SAS, Saint-Jacques Hospital, Besançon, France

Goal of the study

Skin radiance is clinical pattern without any precise definition and quantifiable data. All the parameters that constitute it and their relative proportions are difficult to list. Indeed, skin radiance seems to be a balanced mixture of colour, itself mostly influ enced by the skin microcirculation, light reflection and more globally texture of the skin surface. It seems that its study therefore implies the quantification of each of t hese components.

Methodology

Global evaluation: clinical evaluation

The skin radiance can be evaluated on many items: texture and colour homogeneity, luminosity, brightness and transparency (CLBT model).

Assessment of light reflection:

When the skin surface is irregular, it absorbs light with difficulty and reflects it in many directions. The assessment of the specular component provides direct information on the glare of the skin. From this principle, two specifics devices have been developed, one by our lab (Eclascope®) and the other by Courage+Khazaka (glossymeter®). These techniques allows to access to the diffusion and the reflection of light rays, which depends on the brightness. Moreover Gillon *et al* have also developed a specific contactless device (brillanometry). Its principle consists in directing a polarized light beam perpendicularly to the skin surface and to assess the reflected beam in the same direction.

Assessment of skin relief by:

- Visioscan®, which features a black-and-white high-performance digital camera taking pictures of the skin surface under standardized homogenous ring-shaped UV A-illumination.

- profilometry devices using fringe projection specifically dedicated to the skin (DermaTop and Primos…).

Assessment of skin colour by:

- colorimeters (chromameter CR400, colorimeter CL400) giving the L*, a* and b* parameters (CIE LAB 1976).

- videocapillaroscopy, that allows direct visualization of the capillary network *in vivo*. If the microcirculation is stimulated, the light will more easily reflect off the red blood cells at the source of the skin colour.

Conclusions

A single instrument enable to specifically characterize skin radiance is not yet available. Indeed, skin radiance not only depends of one parameter but is the result of a combining of many of them, but it's possible to approach this problematic, associating different skin measurement.

Key words: skin radiance, optic properties, quantification

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LASER SCANNING CONFOCAL MICROSCOPY: APPLICATION TO COSMETIC PRODUCT ASSESSMENT

Eric Fernandez, Frédérique Poirier, **Sylvie Marull** and Céline Laperdrix

Key words: confocal microscopy, reconstructed epidermis, equivalent dermis.

Numerous successive steps are necessary to develop active ingredients and cosmetic products. For skincare products, effectiveness assessment is conducted in two directions. Generally active ingredients are tested on human cells models and finished products, on human panels after safety assessment.

The aim of the present study is to explore the effectiveness of a cosmetic formula on advanced tissular models by Laser Scanning Confocal Microscopy (LSCM).

To achieve our ends, two tridimensional models were used: Human Reconstituted Epidermis (HRE) and Equivalent Dermis (ED). We investigated several witnesses of skin structure and cohesion at these 2 levels: desmosomal cadherins expression in the HRE, collagen fibbers organization in the ED.

We treated the HRE model with the formula diluted in growth medium. After 48 hours, HRE were frozen and sectioned for further analysis. Immunohistochemistry protocols were performed, followed by LSCM observations with a combination of several excitation laser lines. We have been able to visualize different structures of interest with a high resolution.

For equivalent dermis, normal human dermal fibroblasts (FDHN) cultivated in monolayers were pre-treated several days by the formula. At the end of the treatment, the FDHN were seeded in Petri dishes with collagen type I in controlled pH medium and incubated in normal conditions (37°C, 5%CO_2, saturated humidity). The ED and its structure were directly observed in situ using reflectance mode.

Treated HRE presented a better organization and structuring in all the suprabasal keratinocytes levels, as showing the desmoglein-3 organization. This suggests a barrier function improvement and a better defence against environmental stresses. On treated ED, we clearly observed adhesion points between the fibroblasts focal sites and the fibbers. The environmental matrix was modified and closer from the cells nucleus. These modifications conducted to a retraction of the model, a better organization of the matrix network and a densification, linked to skin firmness properties and wrinkles attenuation benefits.

We explored with success innovating techniques (skin models and imaging) and reached our goal, obtaining didactic and illustrated evidences of our formula effectiveness.

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OBJECTIVE EVALUATION OF MOISTURIZER EFFECT ON SKIN SENSITIVITY AND BARRIER INTEGRITY DURING CONTINUED INSULT PRESSURE

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Background: Demonstrating the ability of a moisturizer to reduce skin sensitivity as it helps restore barrier integrity is a key part of product claims substantiation. Typical measures of sensitivity usually rely on subjective self-assessments while monitoring barrier disruption using TEWL during optimum seasonal periods for severe dry skin. This presentation introduces an objective, continuous skin insult model for evaluating moisturizer treatment effect on skin sensitivity and barrier integrity irrespective of season.
Purpose: This study evaluated the impact of two skin moisturizers on barrier integrity, neural sensitivity and surface texture during continued insult pressure.
Methods: The formulas were evaluated in a randomized, double blind, two period crossover design using an exaggerated forearm wash model. Normal, healthy female volunteers were enrolled in this 5 week study. To damage the skin, during the first 4 days, subjects participated in standardized, exaggerated forearm washes (4x/day) on both arms. This was followed by 10 days of washing both arms twice a day to maintain the damage. During this period, the assigned product was applied to one arm (3x/day) to assess its efficacy while the other arm served as a control. After a 7 day rest period, the whole process was then repeated with the second product being used on the other arm. Within each test period, skin condition was evaluated at baseline (Day 0 of the test period), Days 4 & 9 prior to the first treatment/wash of the day, and Day 14 (end of the treatment period). TEWL, neural sensitivity (Neurometer), barrier function (methyl nicotinate sensitivity) and surface texture (Visioscan) were measured.
Results: Untreated forearms exhibited significant barrier disruption, increased neural sensitivity, and a decline in surface texture as a result of the exaggerated arm washing. Treated forearms exhibited significant improvement in the barrier, neural sensitivity and surface texture even with continued insult.

Conclusions: This method is a reliable, objective model for demonstrating the impact of skin moisturizer on barrier integrity, neural sensitivity and skin texture during continued skin insult pressure.

Key Words: Moisturizers, exaggerated washing, neural sensitivity, barrier integrity, TEWL, Visioscan

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IN VIVO ASSESSMENT OF SKIN WRINKLES REDUCTION USING OPTICAL COHERENCE TOMOGRAPHY DURING TREATMENT WITH AN ANTI-AGING PRODUCT

Luciana M. C. Vasquez-Pinto[1], Marcello M. Amaral[2], Marcus P. Raele[2], Anderson Z. Freitas[2]

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Non-invasive optical methods became efficient tools for *in vivo* visualization of skin. Different from conventional skin photography methods, Optical Coherence Tomography (OCT) generates cross sectional images of tissue microstructure, using infrared light and employs interferometric methods to detect light backscattered from tissue. The skin depth profiling images, acquired with OCT, can than be used to determine wrinkles profile, and using image analysis methods developed to measure roughness parameter and determine cosmetic products efficacy.

The aim of this work was to develop a method to access objectively, using OCT images, skin topography changes following a cosmetic treatment with an anti-aging product, mainly concerning wrinkles reduction.

A periorbital region was measured at day 0, and 7, 14 and 28 days after anti-ageing treatment, non-treated periorbital area was used as individual control. An algorithm was developed to recognize skin surface to calculate the rough surface parameters Ra and Rz (according DIN 4768). By analyzing these parameters we were able to determine the frequency depth distribution, both from OCT images without human interaction.

We found that this method was able to quantify small variations in skin surface roughness (1%). After 28 days, significant reductions in Ra (6.2%) and Rz (6.7%) parameters were observed in treated areas whereas non-treated areas showed no changes in skin roughness. Frequency depth distribution of OCT values (5 to 600 microns with steps of 5 microns) showed a reduction in the frequency of events in a range of 170 to 300 microns and a corresponding increase in the frequency of events from 5 to 170 microns. These results are consistent with the wrinkle reduction profile expected from anti-aging treatments.

OCT proved to be a highly sensitive method to detect skin topography variation, and to determine cosmetic efficiency in a non-invasive, non-contact, fast and quantitative way.

key words: Optical Coherence Tomography, wrinkles reduction, anti-aging

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SINGLE CELL GEL ELECTROPHORESIS OR "COMET ASSAY"

Single cell gel electrophoresis or "Comet assay" (CA) is a versatile method to analyze DNA integrity in living cells. Unlike cytogenetic assays does not require mitotic cells to be studied, a features that extend its applicability to the study of many tissues like mucosa and skin, where the obtainment of cycling cells is difficult and time consuming. Electrophoresis of the whole DNA in a nucleus from cells embedded in low melting point agarose under alkaline or neutral conditions, allows the evaluation of DNA damage and repair in single cells. This assay unifies the precision of a biochemical technique with the ability to individualize results at cellular level characteristic of cytological procedures.

CA can be modified to fulfill different requirements; enzyme addition to evaluate oxidative damage, variation of temperatures or repair inhibitors to study DNA repair. In our group, CA has been applied to the evaluation of genotoxic or antigenotoxic properties of agents like aminothiols, quelators and enzyme inhibitor. Also in the study of repair capacity in breast cancer patients and the dissection of comparative DNA repair kinetics in normal subjects at different temperatures. In collaborative studies CA have been utilized with different sentinel organisms and in the growing field of molecular parasitology for the evaluation of DNA responses from *Echinoccocus granulosum* under oxidative stress. Our group is now focusing in the evaluation of DNA damage in skin exposed to oxidants, environmental damage to mucosa and biomonitoring of human and non human exposed to genotoxicants or drugs features of a cytological one

PROGRAM SEPTEMBER 25, 2010

date	time	activity	speaker	country
Sept 25th		**Joint Session ISBS - ISSCR: Stratum Corneum**	**Bernard Querleux - Anthony Rawlings**	
	08:30 - 09:15	**Dry skin and its measurement**	**Keynote speaker: Anthony Rawlings, PhD**	**United Kingdom**
	09:15 - 09:30	Blind Man Dermatology update	**Grove, G.**	United States
	09:30 - 09:45	Molecular immuno tomography of corneodesmosomes	**Aurelie Laloeuf**, Kjell Hultenby, Ulf Skoglund, Sergej Masich, Stina Svensson, Lennart Svensson, Michel Simon, Guy Serre, Bertil Daneholt, Lars Norlen	Sweden
	09:45 - 10:00	Terahertz spectroscopy of the stratum corneum	**Koji Mizukoshi**, Kenya Hirayama, Shingo Ichino, Syuji Katori, Guan Yu, Kodo Kawase	Japan
	10:00 - 10:15	Interpretation of the human skin biotribological behaviour after tape stripping	**C. Pailler-Mattei**, R. Vargiolu, C. Guerret-Piécourt, H. Zahouani,	France
	10:15 - 10:45	coffee break (grad hall) and posters (salon Colonial)		
		Session 3: Skin studies	**Stacy Hawkins - Alejandra Crespo**	
	10:45 - 11:30	**Infant skin**	**Keynote speaker: Steven Hoath, MD**	**United States**
	11:30 - 11:45	A direct Comparison of Rewet Methods to skin health as measured by transepidermal water loss	**Martha Tate,** Jason Cohen, David Fell, Larry Sawyer, Michael Veith, Melanie Gorges, David Koenig	United States
	11:45 - 12:00	Early Effects of Pulsed-Dye Laser on Skin Properties of Burn Scars in Pediatric Patients	**Shoná Burkes**, J. Kevin Bailey,Marty O. Visscher, Jennifer Whitestone, R. Randall Wickett	United States
	12:00 - 13:30	lunch		
		Session 4: Skin Imaging	**Stephan El Gammal - Chil Hwan Oh**	
	13:30 - 14:15	**Perspectives in Skin Imaging**	**Keynote speker: Karsten König, PhD**	**Germany**
	14:15 - 14:30	Imaging of various stages of acne: a few modalities	**Iqbal Sadiq**	United States
	14:30 - 14:45	Evaluation In-vio keratinocyte size with confocal laser scanning microscopy at 830 and 445 nm	**J.C. Pittet;** C Heusele; S.Schnebert; J. Descoubes; C. Feaucheux; A. Bernois	France
	14:45 - 15:00	Confocal raman microspectroscopy of excised skin: 1) study of skin signal variability 2) follow up of caffeine and resveratrol permeation	**Sana Tfaili**, Gwendal Josse, Cyril Gobinet, Jean-François Angiboust, Michel Manfait, Olivier Piot	France
	15:00 - 15:30	coffee break (grad hall) and posters (salon Colonial)		
		Session 5: Skin studies	**Ernest Braue - Raquel Zorzer**	
	15:30 - 15:45	A Novel Approach to benchmark expert visual grading for crow´s feet with quantitative measurement	**Stephen R. Schwartz**, Shefali Sharma, Raj Chhibber	United States
	15:45 - 16:00	An easy-to-use method fir skin perceived age characterization and automatic guide for product choice	**Luciana M C Vasquez-Pinto**, Leonardo R Alves	Brazil
	16:00 - 16:15	line network morphology and tribology of Human Skin During Ageing	**H. Zahouani,** G. Boyer, C.Mattei Pailler, R. Vargiolu	France
	16:15 - 16:30	Addressing the potential use of natural extracts of Andean plants with anti-age action: From extract to the formulation	**Valenzuela Alba Lucia**, Guzman Mauricio, Alfonso Paola, Cortazar Tania	Colombia
	16:30 - 17:15	**Sensitive skin**	**Keynote speaker: Enzo Berardesca, MD**	**Italy**
	17:30 - 18:45	ISBS General Meeting	**Salon Fiesta, ISBS Board**	
	21:00 - 02:00	Gala dinner Salon Fiesta	Marriott Plaza	

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BLIND MAN DERMATOLOGY UPDATE

In 1966, the late Dr. Albert Kligman delivered a seminal speech to the American Society of Cosmetic Chemists entitled "Blind Man Dermatology" in which he recognized the pressing need for a quantitative methodology that would reveal otherwise "invisible" changes in the skin. Although written nearly 45 years ago, this visionary paper is still well worth reading today. Indeed it has been the guiding light that has lead to development of most of the instrumental techniques that we currently enjoy today in our field. We will consider how much progress has been made to fulfill his wish list of 10 instruments to "profile the skin in health and disease". Special emphasis will be placed on those instruments dealing with the stratum corneum. We have much to be proud of with the noninvasive methodologies that we have developed but much remains to be done. It seems that we are currently at a crossroads as to what type of devices are needed for the future. Some feel that highly specialized and very sophisticated instrumentation which can only be employed under carefully controlled laboratory conditions are what is necessary. Others feel that it is far better to take a more practical approach and develop easy to use, portable and inexpensive units that could be used not only in the clinic but perhaps by the patient themselves at home. Regardless of which path is taken, the future of developing meaningful measures based on biophysical measurements and/or skin imaging techniques is very bright indeed.

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MOLECULAR IMMUNO-TOMOGRAPHY OF CORNEODESMOSOMES

Aurelie Laloeuf[1,6], Kjell Hultenby[2], Ulf Skoglund[3], Sergej Masich[1], Stina Svensson[4], Lennart Svensson[4], Michel Simon[5], Guy Serre[5], Bertil Daneholt[1] and Lars Norlen[1].
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Background:
Corneodesmosomes are modified and specialised epidermal desmosomes, which mediate cell-to-cell adhesion in the stratum corneum. Corneodesmosin (CDSN) and desmosomal cadherin desmoglein 1 (DSG 1), are thought to be among others, adhesive molecules responsible for the adhesion between corneocytes. However, very little is known about their arrangements and binding interfaces at the molecular level.
Goal of the study:
The aim of this study was to localize the various proteins of corneodesmosomes in 3D, showing their arrangements and binding interfaces in order to gain new insights in the molecular basis for stratum corneum cohesion.
Methodology:
For this purpose, the 3D structure of corneodesmosomes was reconstructed in high pressure frozen freeze substituted skin samples, using electron tomography and immuno-electron tomography. The newly developed molecular tissue immuno-tomography was optimized to better understand the molecular architecture of corneodesmosomes.
Results:
With this method, we are able to overcome the limitations of 2D immuno-gold labelling and determine corneodesmosin's location in the stratum corneum extracellular space and its relation to cadherins at the molecular level.
Conclusion:
In conclusion, this method helps shredding some light into stratum corneum cohesion.

Key words: corneodesmosomes, electron tomography, immunolabeling

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TERAHERTZ SPECTROSCOPY OF THE STRATUM CORNEUM

Koji Mizukoshi[1)], Kenya Hirayama[1)], Shingo Ichino[2)], Syuji Katori[2)], Guan Yu[2)], Kodo Kawase[2)]

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Introduction

Stratum corneum samples can be easily obtained by methods such as tape-stripping, and various techniques exist for analyzing properties such as morphology and components. In comparison with other techniques, spectroscopy using light or electromagnetic waves can be easily prepared and manipulated. However, accurate analysis of morphology and components is difficult with conventional spectroscopy due to the thinness of stratum corneum sample.

In recent years, research has advanced regarding terahertz waves (0.3 - 10 THz). Terahertz waves are lies in the spectrum region between milliwaves and infrared, and combine the permeability of electromagnetic waves with the handleability of light waves. Due to these characteristics, terahertz waves are now being applied to various researches.

In the present study, we analyzed stratum corneum using terahertz spectroscopy and report herein data regarding the morphology and component.

Methods

For morphology analysis, we used a multispectral refrection imaging system based on a THz-TDS and transmission-reflection measurement was applied to stratum corneum tape-stripping samples sandwiched between 650 μm silicon plates or mirrors. For component analysis, we constructed a measurement system using a backward wave oscillator (BWO), and the metal mesh technique was applied to stratum corneum sheets fixed on square metal mesh with a hole diameter of 169 μm. Stratum corneum sheet was treated with chloroform methanol and heated for 30 sec at 80°C for the purpose of changing character.

Results and Discussion

Initial basic measurement of stratum corneum tape-stripping and sheet samples with the present terahertz measurement system without use of transmission reflection or metal mesh measurement techniques revealed no spectral differences from reference values. Application of transmission-reflection measurement to stratum corneum tape stripping samples to analyze morphology demonstrated a clear spectral difference from reference values. Using the obtained waveform, stratum corneum thickness was estimated based on Fabry-Perot Etalon Theory. Metal mesh measurements of the stratum corneum sheet for component analysis also revealed clear spectral differences from reference values. Delipidation of the stratum corneum using chloroform methanol resulted in spectral changes, as did heating for 30 sec at 80°C. The present findings suggest that measurement of human stratum corneum using terahertz spectroscopy is an effective, easy analysis technique regarding morphology and component.

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INTERPRETATION OF THE HUMAN SKIN BIOTRIBOLOGICAL BEHAVIOUR AFTER TAPE STRIPPING

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Goal of the study:

The present study deals with the modification of biotribological behaviour of the human skin once the tape stripping application is performed.

Methodology:

The experimental device developed to study the human skin friction coefficient *in vivo* uses a classical sphere-plane tribometer, using a light normal load. Indeed, a spherical smooth steel indenter (radius R=6.35mm) is gently applied against the inner forearm skin. The friction system uses 2D sensors and displacement configuration which give the measurement of normal and tangential loads versus displacement between the spherical probe and the inner human forearm. The automated system controls a constant applied normal load and offers a range of sliding velocities (between 200µm/s until 1000µm/s). The maximum tangential displacement is 1.5 cm. The maximum normal displacement during the loading cycle is about 1.5 cm with a resolution of 1µm. With these conditions, the normal load range is between 1mN to 100mN with a resolution of 1µm.

The tape stripping procedure consists of the sequential application and removal of adhesive tapes on the skin surface in order to remove the stratum corneum (SC) layers, which electrically charge the skin surface.

Results:

The skin electric charges generated by the tape stripping tests highly change the skin friction behaviour by increasing the adhesion component of the skin friction coefficient. It has been proposed to rewrite the friction adhesion component as the sum of two terms: the first classical adhesion term depending on the intrinsic shear strength, τ_0, and the second one depending on the electric shear strength, τ_{elec}. The experimental results allowed to estimate a numerical value of the electric shear strength τ_{elec}. A plan capacitor model with a dielectric material inside was

used to modelise the experimental system. This physical model allowed to evaluate the friction electric force and the electric shear strength values in order to calculate the skin friction coefficient after the tape stripping.

Conclusion:

The comparison between experimental and theoretical values of the skin friction coefficient after the tape stripping showed the importance of the electric charges on the skin biotribological behaviour. In pharmacology and dermatology tests the tape stripping procedures are usually used but the effects of the electric charges created by the tape stripping have never been measured and never taken into account.

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A DIRECT COMPARISON OF REWET METHODS TO SKIN HEALTH AS MEASURED BY TRANSEPIDERMAL WATER LOSS (TEWL)

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Background/purpose: Recently there has been research reporting that REWET test methodology is a measurement that correlates to skin condition. However, previous research did not directly compare REWET measures with an actual skin health measurement such as Transepidermal Water Loss (TEWL). The primary goal of this research was to directly measure an absorbent article's impact on skin hydration via TEWL testing and explore if there was any correlation to a variety of REWET test methodologies.

Methods: The study compared four published testing methods to assess diaper wetness. Three are versions of REWET protocols, two of which use collagen as the REWET absorbent medium, the other uses blotter paper. The fourth method was TEWL, a direct skin hydration method in which an open-chamber computerized evaporimeter is used to measure water loss from the volar forearm region of adult volunteers after having worn partially wetted diapers applied to the forearm. The testing matrix consisted of four variations of a diaper differing in outercover breathability or absorbent transfer layer materials.

Results: TEWL results indicated that all four codes were significantly different, with outercover breathability having the greatest impact on skin hydration followed by transfer layer differences. Results across the different REWET methods were contradictory and showed differences solely based on transfer layer material with none of the REWET methods showing significant differences as a function of outercover breathability.

Conclusions: The REWET test methods did not correlate to TEWL skin hydration values, which are known in the literature to reflect skin condition. The results confirm that REWET testing does not take into account non-absorbent materials that impact a user's skin and the microenvironment established between the absorbent article and a wearer's skin. It can be concluded that REWET should not be recommended as a means to assess skin condition or health.

Key words: REWET-TEWL–Diaper–Skin–Health–Collagen–Transfer Layer

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EARLY EFFECTS OF PULSED-DYE LASER ON SKIN PROPERTIES OF BURN SCARS IN PEDIATRIC PATIENTS

Authors: Shoná Burkes, J. Kevin Bailey, M.D., Marty O. Visscher, Ph.D., Jennifer Whitestone, R. Randall Wickett, Ph.D.

Background: Burn patients not only suffer injury that can be life-threatening, but burns can permanently disfigure their appears, even with optimal care. There is great interest in applying newer modalities to improve cosmetic outcomes for this group of patients. The Pulsed-Dye Laser (PDL) is a potential adjunctive therapy for treating hyperemic and hypertrophic scars. Previous authors have reported varied results, and we sought to measure the effect of this therapy when applied after reconstructive surgery of pediatric burn patients.
Objective: The purpose of this study is to measure the effects of the PDL on scars associated with skin grafts by objectively quantifying biophysical changes in burn-related scars.
Methods: Patients nine years of age or older and undergoing new skin grafts for reconstruction of the extremities were enrolled in the study. Patients were randomized to receive the laser treatment to one-half of the skin graft. The other half was untreated by the PDL and patients served as their own control. All patients were treated with a standard compression therapy, over the entire graft area. Treatment was repeated at 6 week intervals until at least one-half of the graft was judged to have reached sufficient clinical improvement to the extent that there was no need for further compression therapy. Clinical evaluations, digital photographs, three-dimensional laser scans, and biomechanical measurements were made of each half of the scar before each laser treatment. Data were analyzed with repeated measures procedures.
Results: At the interim analysis, a significant decrease in redness has been noted after five to six PDL treatments for 7 sites. There are trends toward reductions in scar height and increases in skin elasticity but these parameters have not reached statistical significance with the data to date. Correlations between standard clinical assessments and objective biophysical parameters will be undertaken when data collection has been completed.

Conclusion: The early results of this study support of the efficacy of the PDL as a treatment modality to reduce skin erythema and to normalize the biomechanical properties of burn-related scars.

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PERSPECTIVES IN SKIN IMAGING

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An overview on current state-of-the-art clinical skin imaging methods is presented. Clinical images will be presented based on ultrasound (7.5 MHZ-100 MHz). dermoscopy, optical coherence tomography including novel 3D multibeam swept-source technology, confocal reflectance microscopy, and multiphoton tomography. The highest resolution (submicron range) can be obtained with non-invasive multiphoton tomography. Even single intradermal mitochondria and single ela-stin fibers can be imaged. The in-vivo multiphoton biopsies are based on two-photon autofluorescence, second-harmonic generation, fluorescence-lifetime imaging, and spectral imaging. The natural endogenous fluorophores such as NAD(P)H, flavins, elastin, collagen, melanin, keratin, and porphyrins as well as the SHG active structure collagen can be detected with single photon sensitivity down to a tissue depth of 200 µm without applying any contrast agents.
The applications of high-resolution skin imaging tools include the study of the cell and tissue architecture of the normal skin (e.g. young vs old), the early diagnosis of diseases such as malignant melanoma down to a single cell level and dermatitis of young children, the monitoring of the treatment effects such as the skin modifications after PDT or cortison application, the study of the pharmacokinetics of topically and systemically applied drugs, the accumulation and effects of cosmetical compounds in the skin such as nanoparticle detection and anti-aging effects (e.g. stimulated biosynthesis of collagen).
Future tools such as hybrid systems based on multiphoton tomography combined with CARS, OCT, optoacoustics, and confocal reflection will be discussed.

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IMAGING OF VARIOUS STAGES OF ACNE: A FEW MODALITIES

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Background: The various stages of acne formation on human skin have generally been studied in the past by clinically grading the visible lesions and by photography. The microcomedones, which are invisible to naked eye, have been studied by cyanoacrylate follicular biopsy. The precursor to comedones and inflamed acne lesions are the microcomedones. The cascade of events from microcomedones to closed comedones to open comedones to inflamed acne lesions can be studied more closely by advanced imaging techniques in vivo. The structure and dimensions of these lesions can be followed for a period of time.

Purpose: To study the structure of comedone in vivo, without resorting to the biopsy procedure and to better understand the various stages of acne formation.

Methods: To count and size the follicular casts of microcomedones we employed the fluorescent imaging of cyanoacrylate strips and color-thresholding. The in vivo imaging of microcomedones was done using the Optical Coherence Tomography (OCT) device. The cross-section of the follicular infundibulum was studied at various depths by a confocal microscope. For larger comedonal lesions, we employed videomicroscopy for surface images, ultrasound device for sectional images and fringe-projection device for three dimensional images. To assess the inflamed lesions, Laser Doppler Imaging was done. Fluorescent photography was performed using a 417-nm excitation wavelength.

Results: Analysis of follicular cast images by a RGB thresholding method only recognized the fluorescence emission of the follicular casts and rejected light emissions from other artifacts. The horizontal and cross-sectional micro-structure was revealed by the optical coherence tomography and confocal microscopy. The videomicroscopy showed individual lesions which could be followed over a treatment period. The ultrasound revealed the structure of the relatively larger lesions. The laser Doppler blood flow imaging clearly showed the locations of the inflamed lesions. Fluorescent photography was useful in showing the distribution of P. Acnes.

Conclusions: The above methods provided deeper in-sight into the evolution and resolution of acne lesions and can be useful for research in this field.

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EVALUATION OF IN VIVO KERATINOCYTE SIZE WITH CONFOCAL LASER SCANNING MICROSCOPY AT 830 AND 445 NM

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Goal of the study

Confocal Laser Scanning Microscopy (CLSM) allows visualization of the keratinocytes of the different layers of the epidermis rapidly and non invasively.

The aim of this study was to quantify in vivo the size of the keratinocytes of the granular and spinous layers with the new VivaScope® 1500 Multilaser to investigate the age effect on the forehead and the ventral forearm.

Methodology

A panel of 98 healthy Caucasian women aged 18 - 70 was recruited for the study. Photoageing was scored according to the Larnier scale. Biomechanical properties of the skin were measured with Cutometer SEM 575 (Courage & Khazaka) with a 2 mm probe and a 500 mBar suction on the cheek and the ventral forearm.

Image acquisitions were taken with the VivaScope® 1500 Multilaser (Lucid - Mavig GmbH) on the forehead and the ventral forearm with 2 wavelengths: 445 nm and 830 nm. Three stacks, separated by 5 mm, with a 2 µm step were performed from the skin surface to 150 µm depth. Mosaics of images (3 x 3 mm) were acquired at the center of this region of interest at granular layer and spinous layer levels. Images were analyzed with ConfoScan V 02 (Orion Concept).

Results

Several parameters were extracted for the quantification of the keratinocyte size and repartition in the epidermis: cell density, mean cell area, mean cell width, mean cell height and a circularity index of the cells. For the determination of these parameters, nuclei and their center of mass were also localized and cells were considered as contiguous objects.

Cell parameters were first quantified on 10 subjects with the 2 lasers in order to select parameters independent of the wavelength. The influence of the depth on the cell size inside the spinous layer was also checked.

The influence of age on the keratinocyte size is quantified on the 2 body areas and compared with the intensity of degradation of biomechanical properties of the skin shown by the Cutometer measurements (decrease of Ua/Uf, Ur/Ue, Ur/Uf and increase of Uv/Ue) and clinical scoring.

Conclusions

Multilaser Confocal Scanning Microscopy allows quantification of keratinocyte size and morphology in vivo in the spinous and granular layers of the epidermis and to analyze age and body site influences.

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CONFOCAL RAMAN MICROSPECTROSCOPY OF EXCISED SKIN:

1/ STUDY OF SKIN SIGNAL VARIABILITY

2/ FOLLOW-UP OF CAFFEINE AND RESVERATROL PERMEATION

Sana TFAILI[a], Gwendal JOSSE[b], Cyril GOBINET[a], Jean-François ANGIBOUST[a], Michel MANFAIT[a], and Olivier PIOT[a]
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Confocal Raman microspectroscopy is a non-invasive biophotonic technique that enables to measure in vivo molecular profiles in the skin without any extrinsic markers. It has been successfully applied in cosmetics and dermatological field for hydration measurement or drug permeation. The present work aims to study 1/ the variability of the Raman response on excised skin samples and 2/ the follow-up the permeation of caffeine and resveratrol.
Four different wavenumbers (532, 633, 660 and 785 nm) were tested. Spectra were registered on and under skin surface at different depth layers. Signal variability at different acquisition points and spectra stability over time (6 hours maximum) were examined. Two types of samples were used: Transkin® (Biopredic, Rennes, France) and pigskin epidermis (Pierre Fabre, Vigoulet Auzil, France); a comparison between these samples was performed for the signals collected at the 660 nm excitation.
Permeation was tested at the 660 nm laser excitation; spectral profiles were collected before and after application of the solution over 5 hours approximately. The collected spectra permitted to follow the structural modifications, induced on the skin after drugs application, and permitted to define diffusion kinetic for both resveratrol and caffeine.

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A NOVEL APPROACH TO BENCH MARK EXPERT VISUAL GRADING FOR CROW'S FEET WITH QUANTITATIVE MEASUREMENT

Stephen R. Schwartz, MS (International Research Services, Inc, Port Chester, NY), Shefali Sharma (Brightex Bio-Photonics, San Jose, CA), Raj Chhibber (Brightex Bio-Photonics, San Jose, CA)

In this paper we describe a novel approach to bench mark expert visual grading for crow's feet with quantitative measurement. This study was carried out with 5 panelists where the grading was done with four grades, from no visible wrinkle to deep and long wrinkles. Each panelist was graded by each Expert Grader and each participant was also measured and quantified by the artificial intelligent system deployed and then the overall scores compared between the visual Expert grading and the measured grading. This study is presented here for crow's feet, where the system is enabled to measure and match the visual perception of a team of expert graders. The quantitative system used in this study was BTBP Clarity Pro™ R&D system. The BTBP Clarity Pro™ R&D - captures full skin scans in multi-spectral lighting, True White Light and Deep Blue Light to reveal skin conditions on and beneath the skin's surface and intelligently distinguishes predominant facial features and maps out the skin within each type of scan. An automated, internal alignment procedure provides an intuitive guide for capturing consistent and reproducible images.

BTBP Clarity Pro™ R&D system enabled the researchers to bench mark today's expert visual grading with tomorrows quantifiable technology. This technology trend will also enable researchers to quantify and measure beyond visual perception making it more accurate, repeatable and scientific. In the future, such studies carried out with Artificial Intelligence Systems will provide much more scientific, accurate and repeatable data for skin product claims. In addition, the intertwining of technology and "consumer perceivable data" might go a long way to validate technology as a true endpoint in supporting advertising claims.

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AN EASY-TO-USE METHOD FOR SKIN PERCEIVED AGE CHARACTERIZATION AND AUTOMATIC GUIDE FOR PRODUCT CHOICE

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The features of appearance that primarily determine how old women look for their age involve genetic and environmental factors. The desire of many to look young for their age has led to the establishment of a large cosmetics industry with a plethora of options available. The tools offered to help this choice are usually time consuming and not always have technical support. The present study developed a tool based on decision tree algorithms to help identify and classify perceived age and gives product advice.

Data from market research identified that age, wrinkles and sagging are the main targets that an antiaging product should address. A multicentric clinical trial was performed with 12 dermatologists and 979 volunteers, aged 25 to 70 years. Questions about moisturize, softness, sagging, elasticity and wrinkles were posed to both dermatologists and consumers. Answers profiles were compared using Kolgomorov-Smirnov, Chronbach's alpha, Pearson correlation test and Bartlett's test. Moisturize and softness are perceived as the same characteristic by both consumers and dermatologists but the later has a broader profile of answers. Sagging and elasticity are perceived as the same characteristic by both groups with similar answer profile. No correlation was observed between consumers' and dermatologists' answers for these attributes. A negative correlation between their answers was showed, for wrinkles.

Therefore, a 4-question tool, with 4-answers options each, was constructed to be used as a quick guide to identify skin perceived age. A clinical trial was performed with 200 volunteers, aged 25 to 80, and CHAID classification tree method was used to determinate the best fit of both consumer and dermatologist answers. Age was confirmed as a key differentiation parameter for all groups followed by wrinkles, sagging and skin type. The groups had convergent classification performances and these were considered significant considering system complexity. The 95% confidence level was used to conduct the statistical analysis.

In summary, this work validated an easy-to-use tool for identify and classify perceived age using a classification tree algorithm able to refine its performance with use. This tool relies on expert and consumer data, and can be used to help advise the best product through a quite simple way thus reaching a large broad of consumers.

key words: Ageing, tools, product recommendation

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LINE NETWORK MORPHOLOGY AND TRIBOLOGY OF HUMAN SKIN DURING AGEING

H. Zahouani, G. Boyer, C.Mattei Pailler, R. Vargiolu

Objectives: Microscopic observations of human skin have shown that skin topography contains a network of lines whose organisation reflects the multidirectional tensions of elastic and collagen fibres in the superficial dermis. This morphology is present at birth and is scale of depth and wavelength increase with age until puberty. The aim of this work is to study how human ageing influences the skin morphology, stiffness, damping and skin tribology.
Methods: A complete device to assess the stiffness and the damping of the skin has been developed. The frequency and strain amplitude range from 10 to 60 Hz and from 1 to 10 µm. An in vivo study including dynamic indentation, topographic analysis and tribology test has been realized on 50 subjects aged from 18 to 70 years divided into 3 groups.
Results: The dynamic indentation shows that the contact stiffness decreases while the tangent modulus increase during ageing. Complex modulus measured by dynamic indentation at 10 Hz frequency stress ranges from 7.17±2.06 kPa for the oldest group to 10.7±2.64 kPa for the youngest group. To study the ageing effect on tribological test, the visco-elastic parameters obtained by dynamic indentation are used as input data to a friction model. At very low contact pressure, the developed model considers the friction force as a combination of adhesive component (with a very low shearing stress) and a deformation (hystersis) component depending on tangent modulus. The model shows how skin surface topography, the loss of elasticity and the increase of tangent modulus during aging influence the tribology of human skin.
Conclusions: Dynamic indentation seems to be a good method to access to stiffness and tangent modulus of human skin during ageing. The combination of the dynamic device, the morphology of the network of lines, tribological test and modelling, give a precious help to understand the biophysical mechanism of chronological ageing.

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ADDRESSING THE POTENTIAL USE OF NATURAL EXTRACTS OF ANDEAN PLANTS WITH ANTI-AGE ACTION: FROM EXTRACT TO THE FORMULATION

Valenzuela Alba Lucia[1], Guzman Mauricio[1], Alfonso Paola[1], Cortazar Tania[1].

Principal Goal: This study raises a critical path of evaluation of some natural extracts, derived from two plants of the South American Andean region, including the bio-guided selection process and a proposal step-by-step for inclusion of the extracts into a cosmetic form with anti-age properties, all this evaluated and supported on *in vitro* models and challenged with final *in vivo* efficacy trials.
Methodology and Results: The study was conducted in three stages. The first one corresponds to the selection of plants based on ethnobotanical and ethnopharmacological information and preliminary phytochemical tests. There were selected two species, *Vaccinium meridionale*, widely known as exotic fruit and, which have been reported antioxidant and antidiabetic properties; and *Hesperomeles heterophylla*, an alternating plant with similar properties, but which have been not reported studies yet with respect to its biological profile. 12 extracts were obtained with different solvent systems (petroleum ether, chloroform and ethanol) from leaves and fruits of each plant, so that would take covered different actives and secondary metabolites that these species possess.
For the selection of the most active extracts, a bio-guided study was performed, using in vitro cell assays with human dermal fibroblast and Balb/c 3T3 mouse fibroblast cell lines. In parallel, radical scavenging activity of some extracts (extracted with chloroform and with ethanol) was determined following the method of DPPH, in order to make an initial approach to an antioxidant activity as a possible mechanism of anti-age action. From there, the four most active extracts were selected. These extracts were ethanolic leaves and chloroformic fruits in the same way to both plants.
In second stage we selected a vehicle system able to solubilize extracts getting them ready for potential use and application in cosmetic formulations without loss the main biological activity evaluated previously. Both pure extracts and vehicle preparations were challenged about in vitro anti-age activity, assessing parameters

such as: scavenger activity, inhibitory activity on dermal proteinases and *in vitro* antioxidant effect in fibroblasts stimulated by UVB radiation.

Based on the results of in vitro screening, the two better vehicle preparations were derived to cosmetic formulations which were then evaluated on in vitro efficacy model named artificially reconstituted skin tissues (EPIDERM™) which was used to evaluated the performance of biological activity of final formulations and *vivo* efficacy trials, in terms to challenge their effect on wrinkles, firmness and elasticity as parameters of anti-age action.

PROGRAM SEPTEMBER 26, 2010

time	Activity	Speaker	country
	Session 6: Skin studies	**Philippe Humbert - Maite San Miguel**	
08:45 - 09:30	**Origin of Latin American Ethnic Groups**	**Key note speaker: Silvia Perez Damonte, PHD**	**Argentina**
09:30 - 09:45	Study of assymetrical facial damage due to cumulative UVA exposure	**Mac-Mary Sophie**, Sainthillier Jean Marie, Jeudy Adeline, Sladen Christelle, Williams Carah, Bell Mike, Humbert Philippe	France
09:45 - 10:00	The Anisotropic Behaviour of the epidermis is key to skin doming during shaving	**Marion Geerligs**, Klaas Hilverda, Ruud Voncken, Paul A.J. Ackermans, Gerrit W.M. Peters, Cees W.J. Oomens	The Netherlands
10:00 - 10:15	A novel Method to Study Skin Lightening Effect of Topical Materials	**Neelam Muizzuddin**, Kenneth D. Marenus, Thomas Mammone	United States
10:15 - 10:30	Quantitative skin imaging	R. Chhibber, S.Sharma, A. Chhibbar, **S.Schwartz**	United States
10:30 - 11:00	coffee break (grad hall) and posters (salon Colonial)		
	Session 7: Skin studies	**Randall Wickett - Silvia Perez Damonte**	
11:00 - 11:45	**a Review of Dermastoscopy experience in Argentina**	**Keynote speaker: Alicia Kowalczuk, MD**	**Argentina**
11:45 - 12:00	Biophysical Properties of Tactile Perception: biomimetic approaches and modeling	**Zahouani. H,** Vargiolu. R, Mezghani. S	France
12:00 - 12:15	A multivariate approach to developing optimized treatments for cutaneous sulfur mustard injuries	**John I. Azeke**, Robert S. Stevenson, Joseph D. Boecker, Roy F. Railer, Robin R. Deckert, Jennifer L. Devorak, Horace L. Lumpkin, Bryce F. Doxzon, Larry W. Mitcheltree, Tracey A. Hamilton, John S. Graham, Ernest H. Braue	United States
12:15 - 12:30	Mechanical characterization of human skin ageing: from the skin in vivo to the reconstructed tissue in vitro	Laquièze Leslie, Aimond Géraldine, Debret Romain, Boyer Gaëtan, Pailler-Mattei Cyril, Sommer Pascal, **Zahouani Hassan**	France
12:30 - 13:00	closing ceremony		
13:00 - 15:00	board ISBS lunch and meeting (Salon Plaza)	only for board members	

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STUDY OF ASYMMETRICAL FACIAL DAMAGE DUE TO CUMULATIVE UVA EXPOSURE

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Background: Published studies assessing whether asymmetrical facial UV exposure leads to any underlying differences in skin physiology and morphology are only observational. These studies demonstrate that visible signs of photot ageing are more evident on the window exposed side of the face suggesting a role for UVA in photo ageing.
Aim: To assess the physiological skin changes associated with visible asymmetrical photo ageing. Methods: 10 subjects were enrolled in the study (age 64 ± 6, 8 women and 2 men), presenting with asymmetrical signs of photoageing due to overexposure of one side of their face to the sun through a window over a long period of time. Split-face biometrological assessments were performed (clinical scoring, hydration with corneometer®, mechanical properties with cutometer®, transepidermal water loss with Aquaflux®, skin relief with fringe projection, photography).
Results: significant differences ($P<0.05$) were observed on clinical scores of wrinkles which were greater on the window exposed side, skin roughness assessed with fringe projection on the cheek and skin heterogeneity assessed with spectrocolorimetry on the cheekbone (the skin was less heterogeneous) and differences which tend to be significant ($p<0.1$) were observed on skin hydration (skin was dryer) as well as skin laxity (skin was laxer).
Discussion: It has been already demonstrated that cumulative UVA exposure induces a thickening of the viable epidermis and deposition of lysozyme on elastic fibers. Our results demonstrate possible consequences of these previous histological findings by showing a decrease in the skin laxity on the window exposed area, as well as a

decrease in the skin colour heterogeneity (chromophores may be less visible due to the increased epidermal thickness). This pilot study provides some evidence for the contribution of UVA to signs of photoageing and does suggest that daily protection against non deliberate UVA exposure indoors may be an important element of any daily sunscreen.

Keywords: UVA, asymmetry,photodamage, i*n vivo*, biometrology

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THE ANISOTROPIC BEHAVIOUR OF THE EPIDERMIS IS KEY TO SKIN DOMING DURING SHAVING

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Removal of beard hair is an intrinsic part of the care regimen for the majority of male consumers. Hairs are ideally cut at the skin surface level. Unfortunately, current shaving systems are not yet able to fully avoid skin damage. During rota shaving, for example, the skin might penetrate the slots of a shaving cap, a phenomenon known as skin doming. When the skin protrudes above the thickness of the cap, the passing cutter might damage the skin (**Error! Reference source not found.**). When considering the dimensions of the lamella and slots, it can be concluded that understanding skin doming requires knowledge about the dynamic mechanical behavior of skin at a micro lengthscale. In other words, the mechanical behavior of the epidermis plays a significant role.

As the skin is a challenging material composed of a layered structure, a wide range of measurement methods for mechanical characterization of skin have been developed. Non-invasive studies can be applied on human skin in its natural environment at different body sites in a reasonably cost-effective manner. However, non-invasive measurements require elegant procedures with a lot of assumptions to simplify the models describing the experiment or numerical-experimental procedures including inverse parameters estimations. The different length scales, ranging from 10 μm of the stratum corneum to the cm scale for the hypodermis, and the inverse relationship between penetration depth and resolution of in vivo measurement techniques form major challenges (Hendriks, 2005). These non-invasive methods are quite successful for mechanical characterization of the dermis and possibly hypodermis, but do still not provide insights into mechanical behavior of the epidermis.

As a result, there is a paucity of papers describing the mechanical properties of the epidermis. Studies to date were either on a very small-sized scale (M.A., Chong, & Cock, 2007; Chistolini et al., 1999), not reproducible (Rochefort et al., 1986) or included the total papillary dermis (Hendriks et al., 2006) and none of them incorporated the effect of the anisotropic structure of the epidermis. Consequently, quantitative data for the upper skin layers are sparse or not existent.
In the present study, the small strain behavior of the epidermis is determined by subjecting the tissue to various loading conditions using in vitro measurement techniques. Shear and micro-indentation were chosen as loading conditions, since their interaction presumably causes the skin doming. Existing testing equipment were adapted to the soft, irregular skin samples under various environmental conditions. The obtained stiffness values are used as input parameters for the development of a finite element model (FEM) to investigate whether or not anisotropic behavior is an issue in skin doming.

Keywords: *epidermis, mechanical behavior, stiffness, shaving, stratum corneum.*

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A NOVEL METHOD TO STUDY SKIN LIGHTENING EFFECT OF TOPICAL MATERIALS

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Skin without significant dyschromia is an aesthetic requirement for people worldwide. There are several in vitro methods to determine the whitening potential of actives; however, the in vivo testing of skin whiteners is a long and expensive process. We have designed a rapid clinical method to screen potential skin whiteners using UV-induced skin tan as a model. Small areas of identical suntan are repeatably induced on the skin and treatment of these sites, allows rapid screening of several skin whiteners within the course of a month. The method provides reproducible results and valuable information about the potential skin lightening activity of topical preparations.

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QUANTITATIVE SKIN IMAGING

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The science of skin imaging has been evolving based on advancements in lighting modalities, camera sensors and lens technology; however, the quantitative data available in an image of the skin is not well understood and skin features have seldom been objectively investigated through the means of artificial intelligence. Skin morphology (influenced by micro topography, water content, blood vessel reactivity, and quantity of melanosomes) varies considerably amongst individuals and can make meaningful study design difficult. We have overcome these difficulties and present here the results of a novel technology to provide a comprehensive methodology for skin quantification. We developed a system to perform quantitative assessments of various skin parameters. The key features indicative of aging: spots, lines, and pores were evaluated on 5 women- 1 below 30 years of age, 2 between 30-50 years, 1 between 50-60 years, and 1 older than 60 years. Comparisons of image analysis results demonstrated that the severity of photo damage of the woman below 30 years of age was on average 96% less than that of the woman above 60 years of age. While older women have significantly greater number of deep lines, spots, and larger pores, the younger groups exhibited more fine lines, and spots of less intensity. Since signs of chronological aging are based on these parameters, this study provides insight into skin aging. The results also provide a valuable scientific foundation for measuring intrinsic aging. Using this technology we have successfully demonstrated the methodology of quantitative imaging as a means for objective assessment of skin parameters.

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BIOPHYSICAL PROPERTIES OF TACTILE PERCEPTION: BIOMIMETIC APPROACHES AND MODELLING

Zahouani. H, Vargiolu. R, Mezghani. S

Objectives: In this study we are interested in vibrations transmitted by roughness of material to the human finger or an artificial finger during a friction test.
Methods: In the first analysis, the human finger is equipped with a sensor very sensitive to vibrations transmitted to the skin during a touch test. The results show that a vibration signature is well correlated with the evolution of the roughness of tested materials, in the range of vibration frequencies of 10 to 1000 Hz. To understand the mechanism of vibration during touch test, an artificial finger was developed. This biomimetic probe is equipped by sensors of friction force and vibration under controlled normal load and velocity. During the sliding of the artificial finger on a textured surface, we measure simultaneously the friction coefficient and vibrations transmitted by roughness.
Results: Results show that the friction coefficient is conversely proportional to the roughness, depending on the real contact area and the effect of adhesion. On the contrary, vibrations show a good linearity between the level of vibration and the scale of roughness. The analysis of the multi-scale properties of roughness and vibration signals by continuous wavelet transform, allowed us to correlate the spatial frequencies of roughness to the vibration mode of different manufactured surfaces. To identify the effect of the local roughness on friction, vibration and tactile perception, a 3D numerical model of elastic contact and friction of human finger and rough surfaces was developed.
Conclusions: Measurements with the artificial finger show a high spatial resolution (λ = 0.05 mm) necessary for the recognition of textures. This artificial finger is excited in the same range of frequencies as the human finger receptors (10 – 1000 Hz). The effect of slopes and wavelength of roughness on friction coefficient and frequencies of vibration is demonstrated by the use of fractal surfaces.
Key words: Perception, finger, skin, vibration, biomimetism

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A MULTIVARIATE APPROACH TO DEVELOPING OPTIMIZED TREATMENTS FOR CUTANEOUS SULFUR MUSTARD INJURIES

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Goal of the study: We have been developing comprehensive treatments for the care of cutaneous sulfur mustard (HD) injuries. Our approach has been to repurpose advanced wound care (AWC) techniques commonly used to treat chronic wounds and thermal burns. Earlier studies indicated that topical anti-inflammatory treatment (TAI Tx) and wound debridement in conjunction with either a nutritive cosmeceutical product or autologously transplanted skin cells were promising treatments for superficial-dermal HD injuries. The purpose of this study was to (1) develop a multivariate analytical method for evaluating wound healing as a function of mechanical, cosmetic, dimensional, physiological, clinical, and histological categories of wound healing and (2) evaluate the short-term (16-day) efficacies of a nutritive cosmeceutical product and autologously transplanted skin cells as components of a comprehensive therapy for cutaneous HD injury.
Methodology: We conducted a treatment optimization study wherein three superficial-dermal HD lesions were created on each of 48 weanling Yorkshire swine (*Sus scrofa domestica*) alongside an unexposed negative control site. Two lesions were treated; the third, untreated lesion, served as the positive control. Twenty-four pigs received a TAI drug combination of clobetasol propionate and diclofenac sodium four times daily for 48 hrs post-exposure. Treated lesions underwent dermatome (n=24) or laser (n=24) debridement at 48 hrs post-exposure followed by AWC treatment using each of the two approaches (n=24, each). Non-

invasive bioengineering and clinical assessments were used to monitor the mechanical, cosmetic, dimensional, and physiological properties of the four experimental sites until 16 days post-exposure. Immunohistochemistry and histopathology were also performed on collected tissues following animal euthanizations.

Results: An optimized treatment protocol for HD injuries was developed following multivariate analysis of pertinent wound healing observations.

Conclusions: Early TAI Tx and proper AWC selection were the most important factors for desirable healing of cutaneous HD injuries.

Key Words

Wound healing, Chemical injury, Non-invasive bioengineering, Multivariate analysis,
Treatment optimization

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MECHANICAL CHARACTERIZATION OF HUMAN SKIN AGEING: FROM THE SKIN IN-VIVO TO THE RECONSTRUCTED TISSUE IN-VITRO

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Background: Skin is a vital organ composed by several layers of heterogeneous composition. The epidermis, a stratified keratinized epithelium, acts as a barrier against external aggressions. The dermis, a reticular layers constituted by a collagen and elastin network include in the extracellular matrix (ECM), plays a main role in skin mechanical behavior. The hypodermis, a fatty layer, affords thermoregulation and deep choc damping. ECM components alterations are observed in many inherited and acquired pathologies, and is also a consequence of physiological ageing. i.e. The *cutis laxa* syndrome is a rare disease characterized by a loose and inelastic skin due to an incorrect elastogenesis. These defects within connective tissues have direct impacts on their functions and their mechanical behaviors.
In order to establish a pertinent relationship between ECM alterations and biomechanical properties, specific static and dynamic bio-indentation approach were developed. Viscoelastic parameters such as stiffness, tangent modulus and damping were assessed *in vivo* on real skin and *in vitro* on engineered tissues.
Methods: Bio-indentation device was used to perform measurements *in vivo* on healthy subjects aged between 20 and 80-year-old; measurements were also performed on a 17 y.o. *cutis laxa* patient and her two healthy sisters. In a second time, a micro-indentation device was adapted to assess engineered tissues mechanical properties, *in vitro*, at very low load (0.2-5mN) with a high sensitivity.
Measurements were performed on reconstructed epidermis (RE), dermal and skin equivalent (DE and SE). Biochemical investigations are currently under development to better characterize engineered tissues composition regarding to the elastin network and its crosslinkings.

Results: *In vivo* skin stiffness varies from 50 to 20 N/m through ages (20 to 80 year old). The indentation curves obtained for the 17-year-old *cutis laxa* patient were similar to those generally observed for a healthy 80-year-old person. DE characterization presents several limits (scaffold, adhesion...). On the contrary, RE and SE presents a fine interface for indentation, thanks to their air-liquid development. Stiffness of SE is about ~10-20 N/m.

Conclusion: This approach affords characterization of skin mechanical behavior in vivo or in vitro with the same method and the same parameters. *In vitro* model permits the correlation of matrix composition (elastin, collagen & crosslinkings) with mechanical response.

Key words: skin, skin equivalent, extracellular matrix, micro-indentation, stiffness, damping.

POSTERS

N°	authors	title	country
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P02	PITTET, Jean Christophe	Image analysis and comparison of confocal laser microscopy and dermoscopic imaging for the evaluation of a whitening product on lentigines of asian women	France
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MEASURING THE THICKNESS OF THE STRATUM CORNEUM BY RAMAN SPECTRA

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Various methods have been proposed for the *in vivo* measurement of the thickness of the stratum corneum (SC) based on the water concentration profiles measured by confocal Raman spectrometry (CRS). Yet the ubiquity of water molecules in all compartments of the skin (SC, viable epidermis, dermis) makes it difficult to validate these methods based on the Raman signals from the molecules. There is an advantage, therefore, in measuring the SC thickness by analyzing the Raman spectra of components localized in the SC.

The purpose of this study was to develop a technique for measuring the SC thickness using Raman signals specifically derived from SC components.

The depth profiles of Raman spectra in healthy subjects were obtained by CRS (Model 3510, River Diagnostics) and analyzed to identify the Raman signals specifically derived from the SC components. To confirm signal specificity, 2-dimensional Raman signals were mapped on skin sections by CRS (Nanofinder®30, Tokyo Instrument Inc.). The SC thickness of *ex vivo* skin samples was measured by our method and by a histological method for comparison.

In the *in vivo* measurements, the signal intensity of the SC at 2880 [cm^{-1}] decreased with increasing depth from the skin surface. The signals at 2880 [cm^{-1}] from the skin of the cheek and forearm disappeared at 13.8+/-3.8 [um] and 17.2+/-3.1 [um], respectively. The signal at 2880 [cm^{-1}] was obtained almost exclusively from the SC of the skin sections. Measurements of the decrease in SC thickness by sequential tape stripping were confirmed by *ex vivo* Raman measurements and the histological method. The signal at 2880 [cm^{-1}] was assigned to the asymmetric CH_2 stretching mode, a mode mainly attributable to ordered structure of the lipid alkyl chains. We believe that this signal is derived from the lipids forming the lamellar structures.

The assessment of the SC region based on the intensity of Raman spectra at 2880 [cm^{-1}] is useful for the *in vivo* measurement of the SC thickness.

Keywords: Raman spectroscopy, stratum corneum thickness, CH_2 stretching mode, lamellar structure

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METHOD FOR EVALUATING THE EFFECT OF FERMENTED- TEA ON TEMPERATURE OF COLD HANDS AND FEET

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Background: Green tea is well known for its benefit for human body such as anti-aging activity, anti-cancer activity, anti-viral activities. However, in Korea there is a long belief that green tea makes human body temperature decrease. Therefore, we developed a new tea through fermentation process. We assumed that our new product can help to keep human hands and feet temperature warm through enhance blood circulation. This study aimed to investigates whether the green tea and the newly developed fermented tea keep hands and feet of human warm despite cold exterior condition.

Methods: Two kinds of tea are used for this study. Green tea (made by Amorepacific Co., Korea) and fermented tea (made by Amorepacific Co., Korea) are used as test materials and water is used as negative control. Fermented tea is made from green tea according following process. Green tea is inoculated with *Bacillus subtilis*, which are isolated from Korean traditional food Chung-Kok-Jang, in 5×10^7 concentration and stayed at 50℃ for 7 days. After that, fermented tea is dehydrated when total water contents are decreased until 4~5%.
90 healthy female volunteers who suffered from cold hands and feet especially in winter are participated in this study. Volunteers are divided into three groups. Each group has provided different products. All volunteers were stayed in a temperature-humidity control room (22℃, 45%) for an hour in order to stabilizing their body temperature. We set little low temperature than usual which makes people feel cold so that we can easily notify the effect of our test products on their hands and feet temperature. After that, volunteers drink one of the test products they provided. All products are remained on same temperature. Then we checked volunteers' hands and body temperature using IR camera (FLIR Co., Sweden) for 15 minutes interval.

Results: Water taking groups' hands and feet temperature are decreased sharply even after drinking hot water while green tea taking group and fermented tea taking groups' hands and feet temperature are less decreased. Especially, compared on feet

temperature decreasing, fermented tea taking groups' feet temperature are higher than water taking groups' feet temperature in significant difference.

Conclusions: Our results showed that the fermented tea significantly inhibited human's hands and feet from temperature drop. These data suggested that fermented tea can prevent hands and feet temperature from decreasing in cold condition.

Key word: fermented-tea, *Bacillus subtilis,* green tea, cold, hands and feet, temperature, IR camera, decrease

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SONOGRAPHIC DETECTION OF COSMETIC FOREIGN MATERIALS ON THE SKIN AND NAIL

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Goal of the Study

To evaluate the potential of ultrasound in the detection of cosmetic foreign materials commonly used on the skin and nail

Methods

We studied 172 patients (170 F/ 2M, mean age 46 year-old; range 25-89) derived by dermatologists with localized cutaneous and ungual lesions associated to cosmetic foreign materials that were detected on ultrasound examinations. All cases were confirmed clinically and/or surgically and the Color Doppler sonograms were performed using last generation equipment and a compact linear probe with a variable frequency that goes from 7 to 15 MHz.

Results

Cutaneous and ungual foreign compounds were recognized on sonography. 85.5% (n=147) corresponded to facial cutaneous fillers (hyaluronic acid, silicone oil, polymethylmetacrilate and calcium hydroxyapatite); 9.3% (n=16) to silicone implants (located on the calf, breast and tip of the nose); 3.5% (n=6) to acrylic deposits on nails; 1.2% (n=2) to facial tensor threads; and 0.5 % (n=1) to nasal porous high density polyethylene. Sonographic echogenicities, extensions and locations of the cutaneous or ungual foreign deposits were assessed for each entity. Secondary involvements of the surrounding tissues and deeper structures or associated conditions were also described.

Conclusion

Sonography is a reliable tool for the identification of commonly used cosmetic foreign materials on the skin and nail, and their potential complications related to their presence or misplacement.

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IMAGE ANALYSIS AND COMPARISON OF CONFOCAL LASER MICROSCOPY AND DERMOSCOPIC IMAGING FOR THE EVALUATION OF A WHITENING PRODUCT ON LENTIGINES OF ASIAN WOMEN

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Objectives

The main objective was to validate the action of a whitening product on lentigines of Asian women by comparing of the dermoscopic images of the skin surface (colors and morphological characteristics) with the intrinsic melanin content obtained by the confocal laser microscopy.

Materials and Methods

For this purpose, 23 Asian women with lentigines onto the face were recruited. Acquisitions of dermoscopic images (VivacamTM,, Mavig, Germany) of the skin surface and acquisitions of stacks with a confocal laser microscope (VivaScope 1500, 850nm wavelength, Mavig, Germany) were performed on the same location (spot previously selected).

Dermoscopic images were analyzed with a specific software (FrameScan V2.9, Orion Concept, France) for the measurements of the color (L*a*b*) and the morphology (surface, perimeter, regularity, clearness, contrast to the skin…) of the pigmented spots.

In parallel, the confocal images (stacks) of the same spots were analyzed with an other specific software (ConfoScan V01, Orion Concept, France) to extract the quantity of melanin contained in the skin whole basal.

All measurements and analysis analyses were performed, 1, 2 and 3 months after a bi-daily application of the product.The product was also evaluated in 24 women in Korea by clinical assessment and chromametric measurements (Chromameter CR300, Minolta)

.**Results – Conclusion**

At 3 months, the results obtained on dermoscopic images demonstrated, a significant decrease both of the color of the lentigines (b*(corrected to the skin)= -4.4% ; Contrast = -11.4% ; $p<0.05$) and morphological aspects (Surface : -36.4% ; Clearness = -11.5% ; $p<0.05$).

In parallel, the results obtained on confocal images confirmed the whitening of the studied spot with a significant decrease of the melanin content reaching -5.9% (Basal cells/mm3 containing melanin - $p<0.05$; corrected to the melanin density on the spotless area)

Those results were confirmed by the results obtained from other studies and measurements (clinical evaluation and standard chromametric measurements) performed both in the French and Korean panels.
This type of study has confirmed the great interest of the quantitative imaging with a confocal laser microscope, correlated to the image analysis of digital dermoscopy to study the skin intrinsic pigmentation and the effect of an active product.

Key words: In Vivo Confocal Microscopy, pigmentation, melanin, dermoscopy, image analysis

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ASSESSMENT OF ERYTHEMA AND PIGMENTATION WITH SPECTRAL AND DIGITAL MEASUREMENTS

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Background: In clinical trials, the follow-up of actinic erythema is usually carried out by measuring colour (by colorimetry or spectrocolorimetry), completed by clinical scoring and sometimes illustrated by digital photography.
Objective: The aim of this work was to show that, by defining a photographic index for erythema and melanin, digital photography can be used for quantification. Prior to the measurements, colorimetric calibration was performed to achieve the best possible comparison between colour measurements.
Material and method: We have analysed the data of a previous study on 10 subjects presenting with a solar simulator-induced actinic erythema (MED x 3). Standardized photographs (3 photographs including a colour chart GretagMacbeth) of each forearm were taken at different times (D0before, D0after, D1, D2, D3, D4 and D8) with Canon Eos20D + Flash Canon Twinflash MT-24EX. Spectrocolorimetric measurements were also taken with a Konica Minolta CM-2600d device equipped with Skin Analysis SM-SA software : this technique gives the colorimetric parameters L*a*b*, an erythemal index (EI) and a melanin index (MI) calculated from the reflectance spectrum. Colour charts were used to calibrate the photographs (and select the best ones), in particular from the luminosity and the red component (L* and a*). Colour measures (L*, a* and b* CIELAB 1976) were then extracted from the photographs of the irradiated areas. These photographic parameters were then compared with those obtained by spectrocolorimetry using a non linear regression (selection of variables by STEPDISK method). Finally photographic indexes of erythema and melanin were calculated.
Results: The preliminary results show that this method gives an excellent correlation between the photographic indexes and the spectrocolorimetric parameters (r>0.77).

Conclusion: Accurate analysis of colour from standardized photographs is possible nowadays in clinical trials. Large regions of interest can be characterised with erythema and melanin indexes, whereas it is not possible with usual colorimetric techniques (measurement diameter between 5 and 8 mm).

Key-words : erythema, melanin, digital photography, calibration, spectrocolorimetry.

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ASSESSMENT OF SKIN HOMOGENEITY BY IMAGE PROCESSING

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Background : Homogeneity (and its contrary heterogeneity) is a semantically rather vague notion which covers mathematical (monotony), geometrical (symmetry, harmony) or physical (coherence) characteristics. Applied to the study of the skin, it is however a very important feature of particular interest for the dermo-cosmetic industry. The purpose of many active ingredients or treatments is to try to homogenize, harmonize or smooth out the skin by having an action on its most obvious visual features such as the skin grain, complexion or texture.

Objective: The purpose of this work was to illustrate different image analysis methods issued from our practice to quantify the skin homogeneity. The main points of interest are 3D measurement by fringe projection (for the skin grain), colorimetry (for the complexion) and 2D image analysis (for the texture).

Material and methods: The skin grain defines the surface formed by more or less rough small "grains" felt when touching the skin. It is possible to quantify this roughness *in vivo* with techniques such as fringe projection. The measurements carried out on the face are accurate enough to distinguish smoothing effects of circa 10 microns.

The complexion of the face is described as homogenous when the colours are close or in harmony. Inversely, a heterogenous complexion is composed of a patchwork of dissimilar and disgracious colours. It is possible to use the colour standard deviation parameter DeltaE (CIELAB 1976) defined in the industry as a metric system to quantify the homogeneity between several measurements carried out by spectrocolorimetry.

In digital photography, several techniques are available to characterize the skin texture, defined as a connexe set of more or less similar levels of grey. It is possible to quantify the image contrast with its histogram or from a co-occurrence matrix specified in relation to the size of the region of interest (global or local reading).

Conclusion: The skin homogeneity can be studied by different image analyses with a specific focus on its various features (roughness, colour deviation, texture). These methods, very similar to visual sensation, are complementary and provide a global and accurate characterisation of the face.

Key-words: homogeneity, image processing, roughness, texture.

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SKIN SEBUM EXCRETION AND SLEEP APNEA

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Goal of the study

The sleeping apnea syndrome is a common disorder that affects 5% of the population, but its diagnosis is underestimated because physicians forget to ask key questions, and the establishment of polysomnography is cumbersome. But given the relationship between excretion of sweat and some brain dysfunctions (eg Parkinson's disease ...), we wanted to evaluate sebaceous excretion in a population suffering from sleeping troubles, particularly sleep apnea, compared to a control group.

Methodology

A preliminary study was then carried out on 26 volunteers (11 women, 15 men, average age = 46.2 years +/-14.8, average Body Mass Index (BMI) = 26.4 kg/m^3 +/-5.6) ; they were sorted in two different populations (apnea versus, n=14, and no apnea syndrom, n=12).

Skin and apnea parameters were compared between both groups: a polysomnographic record was done during the night; concerning the skin parameters, the records -realized on the wakening of the patient- concerned sebum excretion (Sebumeter SM 810, Courage & Khazaka), hydration index (Corneometer CM820, Courage & Khazaka), pH (Skin-pH-meter pH900, Courage & Khazaka).

Results

Observed results show us statistic relation between sleep apnea and age, sex, and BMI, confirming the literature datas. No significant difference concerning the sebum level was noted between the two groups, even if the apnea population revealed a sebum value 15% higher than the non-apnea one (103 vs 118µg/cm²).

For this preliminary study and for a lipid index threshold of 91.5µg/cm², the probability that the diagnosis of sleep apnea is present if the sign of high sebum excretion is present

(Positive Predictive Value) is more than 64.7%; the Negative Predictive Value is 66%, Sensibility is 78.6% and Specificity is 50%.

Conclusions

This study confirmed the existing data for the link between sleep apnea syndrom and age, sex and BMI; a complementary study must be conducted in order to confirm statistically the hypothesis of a relation between sebaceous excretion and sleeping apnea, and to estimate the predicitive ability of sebum level for sleep apnea.

Key words: sebum excretion, sleep apnea, skin study

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BIOMETROLOGICAL ASSESSMENT OF SWEAT SECRETION. CLINICAL STUDY OF ORAL OXYBUTYNIN IN PRIMARY HYPERHIDROSIS

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Background : Primary hyperhidrosis may be a disabling condition causing emotional stress and negative impact on a patient's quality of life. Oral anticholinergics are some of the treatments available. There are few published data on the use of the anticholinergic drug oxybutynin given orally in the treatment of hyperhidrosis.
Objective : To evaluate the efficacy and the safety of oral oxybutynin in the treatment of primary hyperhidrosis.
Material and Method: From January to June 2010, patients with primary hyperhidrosis were treated with oral oxybutynin in the Department of Dermatology, Besançon, France, and attended follow-up. Treatment was started with oxybutynin 2.5 mg three times daily during 3 days. The 3 following days, the dose of oxybutynin was increased at 5 mg per day. Patients then took 7.5 mg of oxybutynin per day during 24 days. The study lasted 1 month from the first day of oxybutynin treatment. Patients were evaluated every two weeks by clinical and biometrologic methods. The following parameters were assessed on the palm and plant: degree of sweating was determined by measuring Trans Epidermal Water Loss (TEWL) using a double-probe Tewameter (TM 300; Courage+Khazaka), skin temperature (Thermometer® ST500), skin pH (pH-meter, PH 900) and skin hydration (Corneometer ®, CM 825). The efficacy of oxybutynin was assessed using a quantification of the amount of humidity, monitored through the use of a colored reaction using iode-amidon. The intensity of the color reaction was estimated using computerized image analysis.

A patient-assessed linear analogue scale (0-10 points) of the severity of hyperhidrosis was completed in all patients and a subjective assessment of disability caused by the symptoms of hyperhidrosis was obtained using the Dermatology Life Quality Index (DLQI).

Results and conclusion : This study underlines the usefulness of biometrological measurements, besides clinical evaluation, in a clinical protocol aiming to determine the efficacy of an anti-sweating agent. The results will be presented in the poster (ongoing study).

Key-words : sweat, hyperhidrosis, oxybutynin.

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TORQUEMETER TEST FOR EVALUATION OF SKIN PROPERTIES: A NEW INTERFACE BETWEEN DEVICE AND SKIN

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Goal of the study

Non-invasive devices used in skin bio-engineering have become crucial tools in cosmetic products evaluation and in clinical dermatology. Among these apparatus, the torquemeter is an instrument which measures the mechanical properties of the skin by a twisting method, using a single use adhesive tape. The use of tape could be a problem because it represents an interface between the skin and the measuring equipment: the own mechanical characteristics of the tape are likely to influence the results. The aim of our work was to find a substitute for the adhesive: it therefore seemed preferable to bond the skin directly with the device.

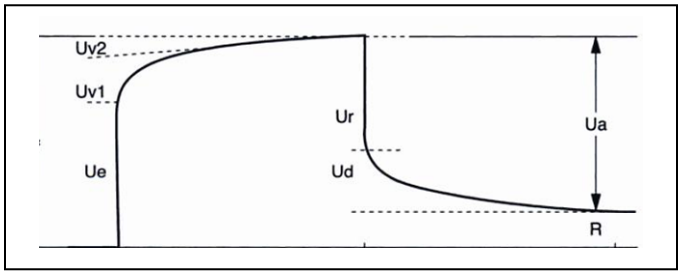
Methodology

An original interface was then tested, composed of a plate coated with silica; four different plates were tested, differing in their relief structure (size of squares forming the microrelief of the surface of the pad, orientation randomized or not).

Thus, a protocol has been established, in order to compare the new device coupled with the silica interface, and the material ordinarily used for this type of measurement (association with adhesive tape). The experiment was conducted in eleven patients (7 women, 4 men), aged of 22 to 29 years old (average age = 25+/-2.3); the site of measurement was the internal forearm. For each volunteers, the skin properties were tested using the torquemeter, associated successively with the adhesive tape, and the 4 types of plates.

The settings for the torquemeter were: 1 cycle (rectangular waveform); duration of the torsional cycle = 10 seconds; relaxation duration = 2 seconds; torque intensity: 10+/-1 milliNewton.meter.

Evaluated values were the Ur, Uv, Ue and Ur/Ue elastic parameters (cf. skin deformation curve)



Results and conclusions

The results obtained with the plates are significantly similar to those obtained with the tape; moreover, the plate with patterns oriented (non-random orientation) and with a greater height shew more stable and repeatable values. This type of material –usable several times- could be then used to substitute the adhesive tape, if it is confirmed on a larger scaled study. The use of the pads had also to be evaluated.

Key words: skin elasticity, torquemeter, plate

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CONFOCAL MICROSCOPY STUDY ON SKIN OF PATIENTS AFFECTED WITH NEPHROLOGIC DISEASES

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Goal of the study

In vivo confocal microscopy is a recent imagery method of non-invasive dermo-epidermal exploration.

The goal of this study was to create a database of images of the skin of patient suffering with nephrologic diseases, and to elaborate a program permitting landmarks and comparison between confocal and histopathology.

Methodology

A clinical study was led on 80 patients belonging to 4 different groups: diabetic dialysed patients, non-diabetic dialysed patients, kidney transplantee and healthy people. The measures were done with a Vivascope 1500 (Mavig), on the internal forearm of the volunteers: quasi histopathologic exam resolution is reach, offering horizontal section of the skin of 500µm x 500µm (compared with vertical sections obtained with biopsy technique). For each patient a "stack" was done, recording 75 images of the skin from the surface to a depth of about 150µm, with a pace of 2µm. For each epidermal/dermal layer observed, a "block" of 8mm x 8mm (16 images x 16 images) was realized.

Results and conclusions

After the realization of this images database, a three dimensional reconstruction program has been developed to make the confocal pictures easier to interpretate: it now allows us to rebuild a vertical section of the explorated area, starting from the initial confocal images sequence. The pratician can observes a section that he can compare to his references and knowledges in biopsy.

This tool will then permit to help the progressive training to confocal interpretation. Analysis and interpretation of the data will be realized in a later study.

Key words: confocal microscopy, nephrologic diseases, histopathologic comparison

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ASSESSMENT OF PROTECTIVE EFFECTS OF COSMETICS WITH UV-FILTERS, VITAMINS, GINKGO BILOBA AND RED ALGA EXTRACTS USING BIOPHYSICAL AND SKIN IMAGE TECHNIQUES

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The combination of UV filters with antioxidant substances and natural extracts with biological activity in terms of photoprotection can provide unique benefits to the skin, by increasing its protection against UV radiation and also by improving skin conditions. Thus, the aim of this study was the assessment of protective effects of cosmetic formulations containing UV-filters, vitamins, *Ginkgo biloba* and red alga *Porphyra umbilicalis* extracts by biophysical and skin image techniques. For this purpose, an emulsion was supplemented or not (F) with *Ginkgo biloba* extract (FG), or red alga *Porphyra umbilicalis* extract (FA), or the combination of these extracts and vitamins A, E and C (FGAV). These formulations were submitted to preliminary studies for the evaluation of Sun Protection Factor (SPF), which were carried out on a group of human volunteers according to the COLIPA methodology After that, the formulations were applied on 10 human volunteers' forearm skin, followed by the analysis of their effects using biophysical and skin image techniques.
This evaluation was done in terms of transepidermal water loss (TEWL) (Tewameter® TM 210), water content of the stratum corneum (Corneometer® CM 825), viscoelastic properties (Cutometer® SEM575), skin microrelief (Visioscan® VC 98) and the dermal thickness (Dermascan C®). The measurements were done before and after a 30 day-period of daily applications. The SPF assesment showed that the formulation containing the extracts and vitamins (FGAV) presented a better photoprotection performance, that means, a higher SPF than the formulation (F) not supplemented with these active substances. After the 30 day-period of application of the formulations under study, it was observed that all formulations provoked an enhancement of skin moisture, when compared with the baseline values. However, only the formulations containing *Ginkgo biloba* or red alga extract showed a signiticant reduction in TEWL. No significant effects were observed on parameters related to skin viscoelasticity and dermal thickness, however a low interindividual variation was

observed on dermal thickness analysis, showing a good precision for this technique. The study also showed a a tendency of microrelief improvement after the 30 day-period of application of the formulations FA, FG and FGAV, according to Sew parameter (number and width of the wrinkles) reduction. It can be concluded that vitamins, *Ginkgo biloba* and red alga *Porphyra umbilicalis* extracts combination in cosmetic formulations can act as biological UV filters and increase skin protection against UV radiation. In addition, the treatment with *Ginkgo biloba* and red alga *Porphyra umbilicalis* extracts can also improve skin conditions, since they can improve skin barrier function and microrelief. Moreover, the biophysical and skin image techniques could be considered sensitive to evaluate the skin effects of cosmetic products.

Key words: Cosmetics, Clinical efficacy, Skin moisturizing, TEWL, Skin microrelief, *Ginkgo biloba* extract, Red Alga extract.

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CHARACTERISTICS OF FACIAL MORPHOLOGY WITH AGING AND FOCUS ON SAGGING

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Goal of the study

In conjunction with recent advances in optical measurement devices, a number of studies have investigated facial morphology changes. However, those mainly studied only specific areas of the face, such as nasolabial grooves or lower eyelids (bags under the eyes), and not details related to general facial morphology. The purpose of this study was to clarify age-related changes in the facial morphological structure of Japanese women using various parameters obtained with three-dimensional (3-D) morphological analysis.

Methodology

The subjects were 251 healthy Japanese women aged 20 to 79 years old. The shape of each face was determined using a VOXELAN NKV-300DS (Hamano Engineering co. ltd., Japan), an apparatus utilized for measuring 3-D curved shapes, with the subject in a sitting position and eyes closed. Data obtained from each subject were analyzed after smoothing with a simple moving average filter (area size, 7x7 pixels; repeated 60 times). Waves forming the surface profiles were calculated based on the differences before and after smoothing. The average surface profiles for different age groups were calculated with a program used to produce average 3-D faces. Curvature, node depth, and the position of nodes around the cheek and mouth were calculated based on curves in the y-z plane of an average surface profile. Those 3-D data were then analyzed using 3D RUGLE (ver. 6, Medic Engineering Inc., Japan).

Results

Our findings showed that curvatures increased with age, particularly in the area near the middle line on the face. In addition, node depth and the position of the nodes in the concave area of the cheek changed with age.

Conclusion

Parameters including curvature, node depth, and position of nodes calculated from curves in the y-z plane of average surface profiles obtaining by 3-D morphological analyses revealed characteristics of facial morphology that change with age, i.e., facial sagging. With our method and the present parameters, we were able to clarify age-related changes in the facial morphology of Japanese women.

Key words
facial morphology, three-dimensional morphological analysis, aging, sagging

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HUMAN MODEL TO STUDY 1ST DEGREE BURN

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Background:
In order to investigate pain reduction, analgesic and healing efficacy of topical products, standardized superficial burns may serve as a model in humans. Pain is the most unpleasant symptom after superficial burn, accompanied by erythema in different intensity dependent on the degree of injury.
Purpose:
To develop a first degree burn model which is reliable and suitable for efficacy studies and safe for participating volunteers.
Methods:
Burn injuries are induced bilaterally, centrally on both forearms with a 16 x 16 mm thermode.
Assessment of subjective pain sensation (by subject, heat-induced pain threshold (HPT)) and objective measurement of erythema (Chromametry) are investigated at pre-defined time points. Each subject serves as their own control which reduces the interindividual variability of the study outcome.
HPT is measured with a thermode with standardized pressure (4.5 kPa). Temperature is increased until unbearable sensation is perceived at which moment stimulus is stopped by subject. 3 stimuli in a row are given and the mean is taken to derive the threshold.
Skin erythema is objectively quantified using reflection measurement with a tri-stimulus Chromameter (CR 300, Minolta, Langenhagen, Germany) measured in the L*a*b* color coordinate system (CIE, 1976). The a* value correlates well with visual assessment of erythema/redness.
Results:
With the employed settings all volunteers developed uniform sharply demarcated erythema characteristically of first degree burns with only very mild to no spontaneous pain. None of the volunteers developed blisters or other reactons that would indicate 2nd degree burns. No adverse reactions were observed.
Conclusions:
Our model has been shown to be sensitive, reproducible and safe. It is suitable for Burn- and Wound topical products, topical anesthetics, anti-inflammatory topical products and Burn- and Wound Plaster.
Key Words: Burn model, burn injuries

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COMPARISON OF DIFFERENT TECHNOLOGIES FOR SKIN SOFTNESS AND VISCO-ELASTICITY ASSESSMENTS

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Objective: It is important to understand and assess the biomechanical properties of skin. Although many devices can measure skin biomechanical properties, the outputs from them were different because of the different principles. The goal of this study is to compare the different technologies for the measurement of softness & visco-elasticity.
Method: 5 different technologies (suction, torsion, bouncing, acoustic wave propagation, PZT resonant frequency shift) were applied for in-vitro (BioSkin), and in-vivo experiments.
Results & Conclusions: The repeatability, sensitivity, and limitation for each device were evaluated from in-vitro measurements on a set of standards, and the correlations among the parameters measured from different devices were determined. In the in-vivo measurements, skin softness and visco-elasticity properties vary greatly from site to site on the body, suggesting the structural differences in skin tissues between two body parts. In addition, skin hydration significantly alters the mechanical properties of skin, including softness and visco-elasticity. With the increase of hydration, the module of skin generally decreases and makes skin felt softer. Overall, this overview of clinical instruments will provide better understanding of the measurement principles and applications for each device.

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PHOTOGRAPHY AS A TOOL FOR DERMATOLOGY MONITORING OVER TIME AND TREATMENT EFFECTS QUANTIFICATION

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Goal of the study
Dermatology clinical practice, or clinical study activities are now using the new scientific photography techniques not only for illustration, but also to objectivize and quantify the effects of a treatment, the evolving of a lesion, or simply the effect of the time.
Methodology
The comparison is only possible if images are exactly taken in the same conditions (in term of luminosity, position of the camera regarding position of the patient, settings of the camera…). Devices permitting full face standardized photography, such as the Skin Surface Analyser® (*), offers the control of all these parameters. Furthermore, it permits to re-position exactly the face of the patient, thanks to tools of landmarking on the face, and a system of superposition between the first image, in transparency with the live view: this allow to adjust and superpose the two and to obtain exactly the same shot.
These issues are addressed through examples of photographs taken, showing the follow up of patients affected by diseases like burning lesions, cutaneous sarcoidosis, granuloma lesion, mycosis fungoides, or vitiligo, …
Results and conclusions
This kind of device is thus a good tool to obtain sufficient rigour for standardisation of photography in dermatology practice: this type of device permit to follow precisely the state of a patient, the effects of treatments, and to quantify them (post acquisition software analysis). The patient could have real and tangible evidence of his before / after appearance, and will take aware of the care which have been provided.

K**ey words**: photography, standardisation, quantification

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