

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

LABORATORIO
RD COSMETICS



RD COSMETICS: ESPLORAZIONE, INNOVAZIONE ED EFFICACIA

Sistema Gestione della Qualità Standard ISO 9001

Team Members



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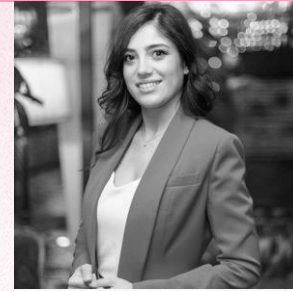
Antonietta Bernardi
Formulator



Ritamaria Di Lorenzo
R&D Manager



Federica Forgione
Formulator



Lucia Ricci
Transdermal absorption
Specialist

RD Cosmetics



2008-2012

European project
with
P&G and Fraunhofer Institut



2005

RD Cosmetics
foundation

2009

Master class in "Cosmetic
Science" Institution



2015

Partnership
with
Cosmetica Italia Servizi Srl



2021

Partnership
with
IQAC, Barcelona



in-cosmetics®
global

2022

Speaker Participation
at
in-cosmetics, London

2023

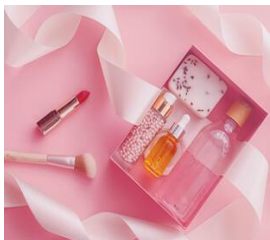
ISO 9001 Certification



September 2023





Poster Presentation
at
IFSCC, Barcelona








FIELDS OF INVESTIGATION

COSMETICS

-  Development
-  Efficacy
-  Analysis
-  Technology

NUTRICOSMETICS

-  Food Supplements Design
-  Chemical profiling
-  Efficacy

TOSSICOLOGY

-  Security
-  Pollutants
-  Release Kinetics

Our Expertise

COSMETIC EFFICACY



ex-vivo

Skin absorption



in vivo

Human volunteers

Efficacy Test

in vivo



VECTRA H2 3D

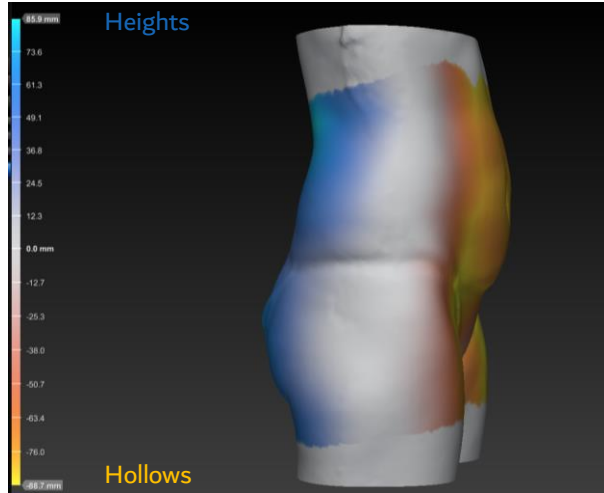
Three-dimensional facial imaging systems are a useful tool that is gradually replacing two-dimensional imaging and traditional anthropometry with calipers.

VECTRA is useful tools that enable facial and body evaluation. Stereophotogrammetry is currently the most promising method of soft-tissue evaluation. It uses high-resolution and fast-acquisition camera systems to capture images of the individual at different angles (the principle of stereoscopy) and reconstructs a 3D image.

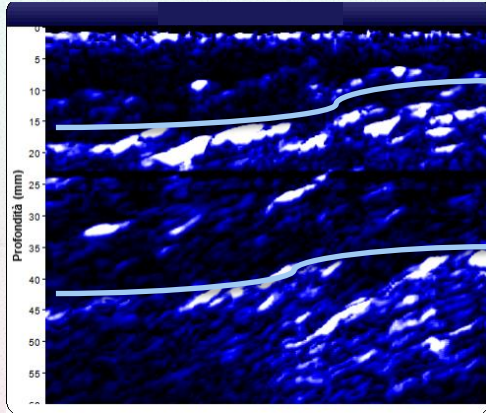


PUSH-UP & BODY SHAPING

3D stereophotogrammetry is an innovative tool that allows clinicians to quickly collect and thoroughly examine volumetric images of facial and body soft tissues.



FAT TISSUE STRATIGRAPHY

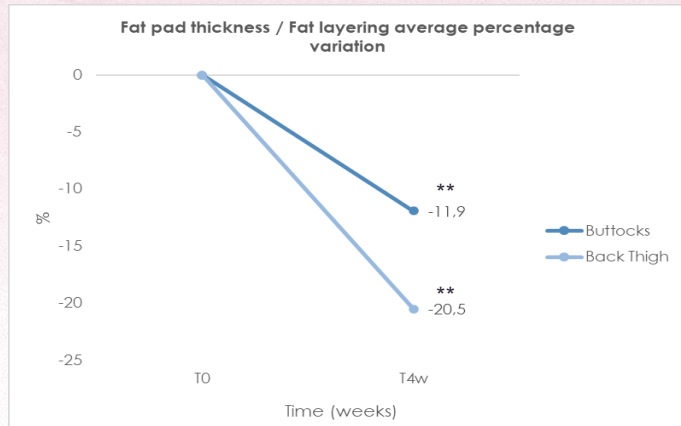


BodyMetrix is an ultrasound system used to record the dynamic image of the examined area.

A 'linear ultrasound scan' or stratigraphy is performed, which allows the treated area to be analyzed in depth.

The resulting ultrasound highlights the boundaries between the different tissues and measures the depth of the epidermis, dermis, hypodermis and muscle in mm.

The first white line represents the superficial fat, then there is the muscle (in black), and the second white line represents the demarcation with the underlying bones. If, following treatment, the stratigraphies show a decrease in white lines, i.e. the fat tissue is reduced and/or disappeared, or mobilised more on the surface, it can be said that the treatment has the capacity to reduce or mobilise subcutaneous fat.



% Subjects improving after treatment		
	Thighs	Buttocks
Fat pad Thickness	80 %	85 %

ASSENZA DI CELLULITE

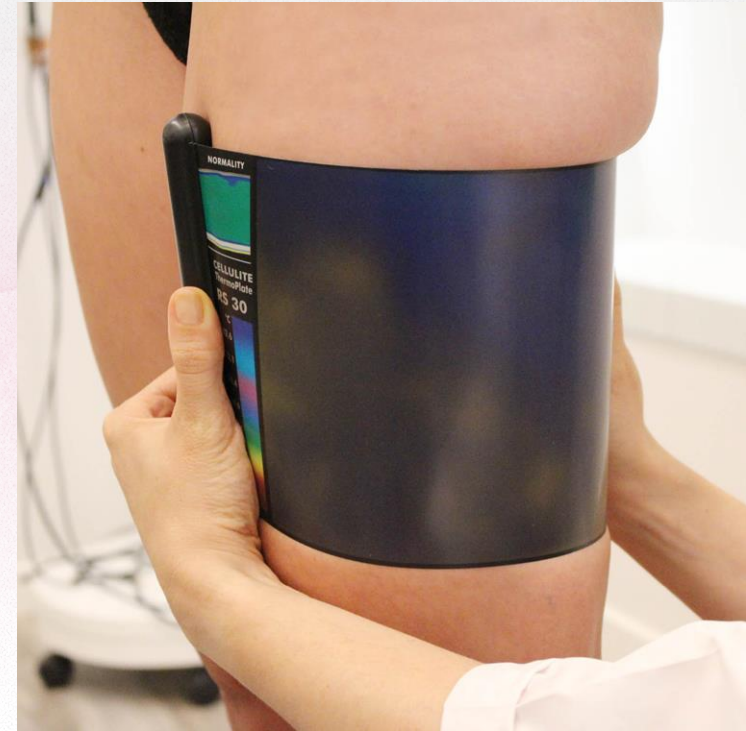
CELLULITE EDEMATOSA

CELLULITE FIBROSA

CELLULITE SCLEROTICA



CELLUTEST



Contact thermography involves the use of micro-encapsulated liquid crystal plates that allow cellulite to be detected precisely from the earliest stages by dividing it into four levels: absent, oedematous, fibrous and sclerotic.

THERMOGRAPHY

T0



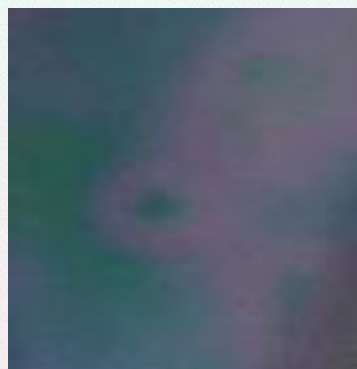
OEDEMATOUS

T4w



ABSENT

T0



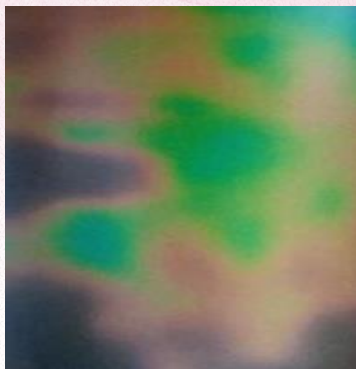
OEDEMATOUS

T4w



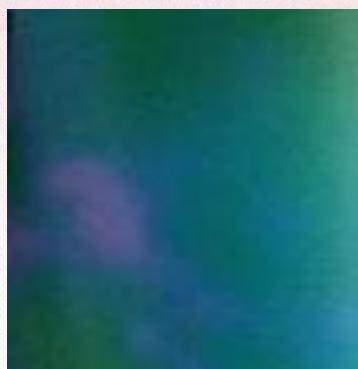
ABSENT

T0



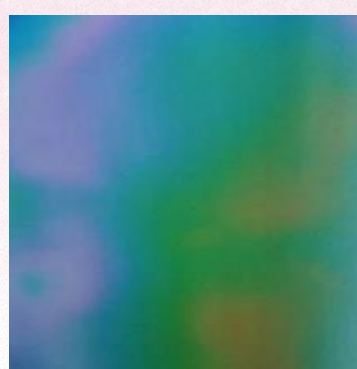
SCLEROTIC

T4w



OEDEMATOUS

T0



OEDEMATOUS

T4w



ABSENT

THIGH

T0



T4w



T0



T4w



VISIA SKIN ANALYSIS



VISIA® skin analysis enables rapid image acquisition with detection of facial features.
IntelliFlash®, cross-polarized light is used to even illuminate the skin.

SKIN ANALYSIS:

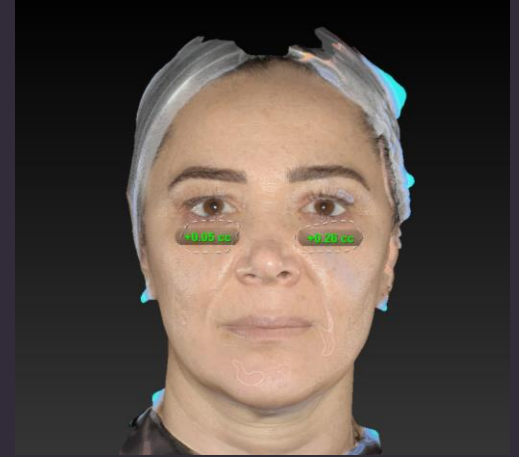
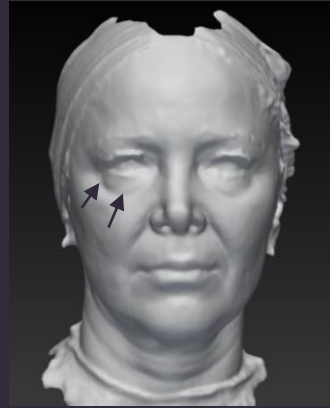
- Wrinkles
- 3D Wrinkles
- Porphyrines
- Skin Texture
- Skin Pores
- Red areas
- UV spot
- Brown spot
- True Skin Age



EYELID LIFTING



EYELID LIFTING & UNDER-EYE REJUVENATION



Log

Volume between selected region and interpolating surface = 0.02242cc
Area of selected surface = 7.476 cm²; area of interpolated surface = 7.28 cm²

LIP PLUMP & MOUTH FILLING

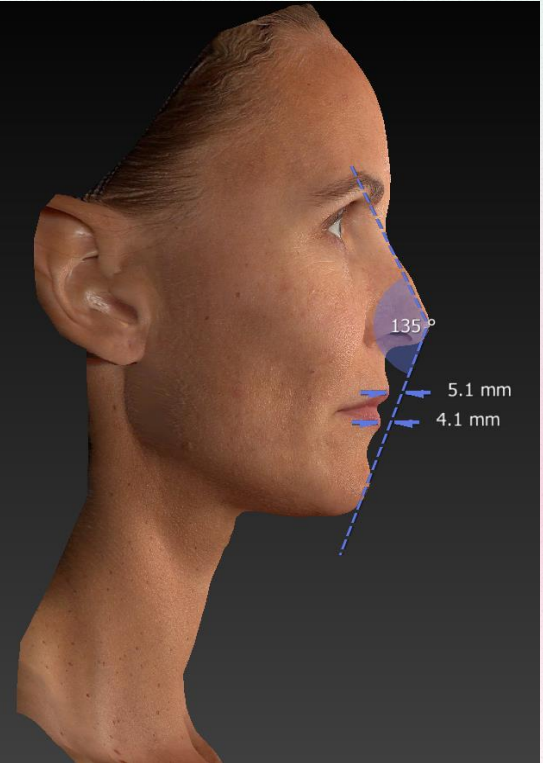
VOLUME/AREA



EVERSION



PROTRUSION



EYELASHES

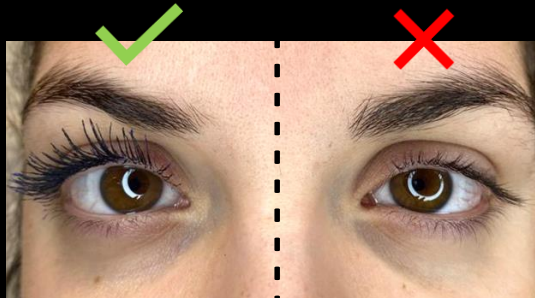
- *Volume*
- *Length*
- *Curving*
- *Flawless look - Eye-look definition*
- *Long Lasting*
- *Smudge Proof*

EXPERIMENTAL CONDITIONS

“Panelists swiped ten times the test product underneath and upwards on the lashes, applying it once daily, for 30 days.”



PRIMER TEST



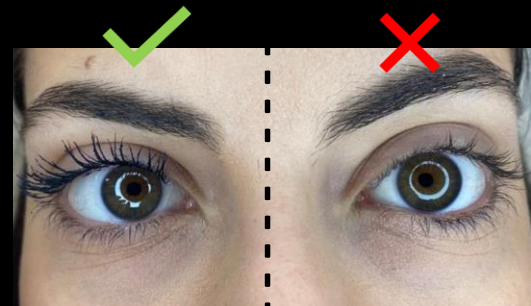
Volunteer N14



Volunteer N2



Volunteer N8



Volunteer N7



APPLICATIONS:

Ultrasounds offer skin ultrastructure images

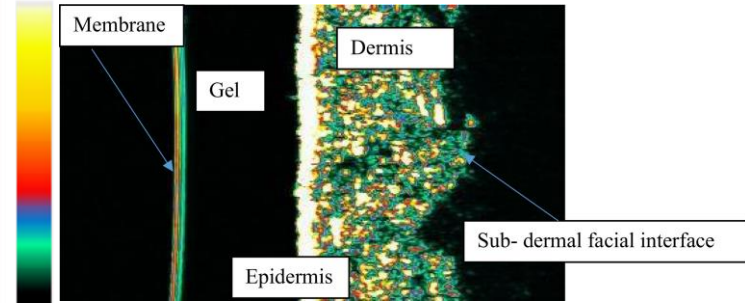
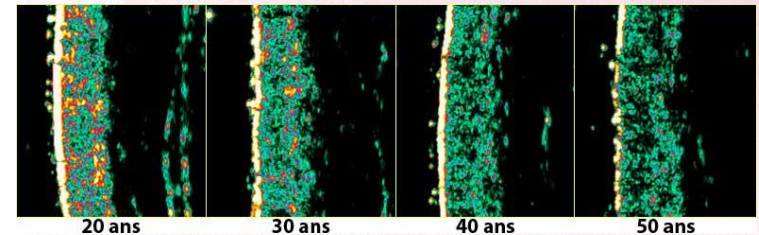
MEASUREMENTS:

The probe generates a sound wave that penetrates the body tissue. The sound waves interact with the tissue and gradually weaken in strength as they are absorbed or scattered. Some of them are reflected, and those reflected are collected by the probe and directed to the processor to be built digital image. Based on the echogenicity shown in Table 1, a filling, or its reaction in the tissue, will be represented as hyperechoic (red-yellow on the screen), hypoechoic (green on the screen), and anechoic (black on the screen).

Echogenicity	The ability of a tissue or substance to reflect sound waves and produce echoes
Anechoic	No echoes, appearing black on ultrasound
Hypo-echoic	Less reflective and with fewer echoes, appears as varying shades of dark green
Hyper-echoic	Highly reflective and richer in echoes than neighboring structures, appearing as varying shades of red-yellow

CLAIMS:

- DENSIFYING
- TONING/FIRMING
- ANTI-AGING
- LIFTING
- PLUMPING



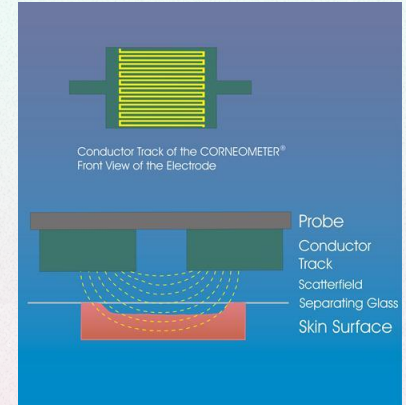
CORNEOMETER CM 825

APPLICATION

Stratum Corneum (SC) hydration (in vivo/ex vivo)

MEASUREMENT

- Conductance



CLAIM

- HYDRATING
 - RESTRUCTURING/REPAIRING
 - REVIVING
 - SOOTHING
-



INDENTOMETER IDM 800

APPLICATION:

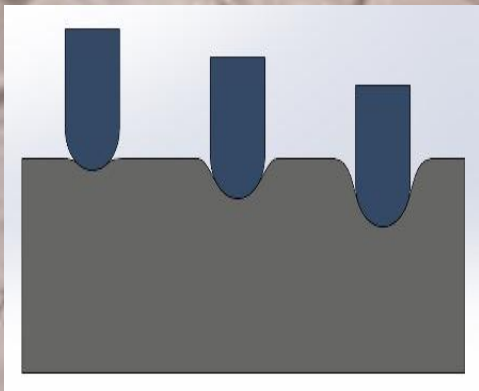
The Indentometer is a useful tool for observing the softness/stiffness of the skin

MEASUREMENT

The measurement principle is based on the force (by a spring) used on the small indenter of the probe to deform the skin. The device measures how the probe indenter displaces the skin. The penetration depth of the pin (displacement) is measured in mm (0-3 mm). The firmer/stiffer the skin, the less deep is the displacement by the pin.

CLAIMS:

- increased firmness
- Softness improvement in softness
- Stiffness improvement



TEWAMETER® TM HEX

APPLICATION:

The Tewameter® TM Hex assesses transepidermal water loss (TEWL), an indispensable parameter for evaluating the skin barrier function.

MEASUREMENT:

It measures the density gradient of water evaporation from the skin to the external environment by thirty pairs of sensors inside a hollow cylinder.

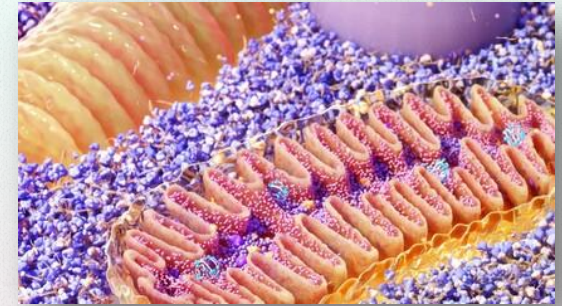
CLAIMS:

- ANTIPERSPIRANT EFFICACY
- MOISTURIZING EFFICACY
- BARRIER ENHANCEMENT
- REGENERATING
- PROTECTIVE
- SOOTHING
- REVITALIZING
- NON-OCCLUSIVE
- TOLERABLE
- ANTI-IRRITATION
- ANTI-POLLUTION



'Skin Energy' is the Next Skin care trend

Skin energy represents the local energy balance of the skin. Skin is constantly emitting energy (heat) in two ways: through **diffusion of warmed air molecules** on top of the skin and through **evaporation cooling**.



Facts

- Skin is the largest organ with high turnover rate in the human body.
- Mitochondria play a vital role in the skin.
- Mitochondrial dysfunction induces skin aging.
- Skin disorders manifest mitochondrial dysfunction.
- Targeting mitochondria may help rejuvenate skin.

Open Questions

- Do mitochondria regulate skin aging?
- Is mitochondrial dysfunction a primary or a secondary cause of skin aging?
- Does targeting mitochondria prevent or slow down skin aging?

COLORIMETER CL 400



APPLICATION:

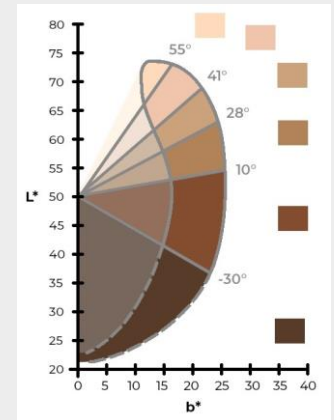
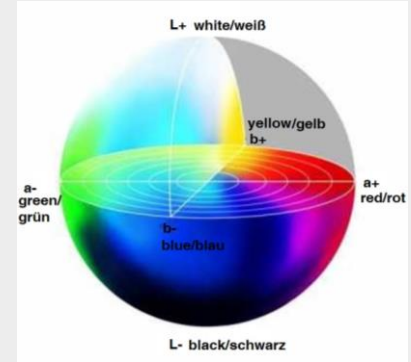
Skin/Hair or Make-up Color detection

MEASUREMENT:

Reflectance

CLAIMS:

- DEPIGMENTING/ANTISPOT
- LIGHTENING
- BRIGHTENING
- LONG LASTING
- WATERPROOF
- NO TRANSFER



MEXAMETER MX18



APPLICATION

Melanin / Erythema (Hb) detection

MEASUREMENT

Absorbance

CLAIMS:

- WHITENING
- SOOTHING



CUTOMETER DUAL MPA 580



APPLICATION:

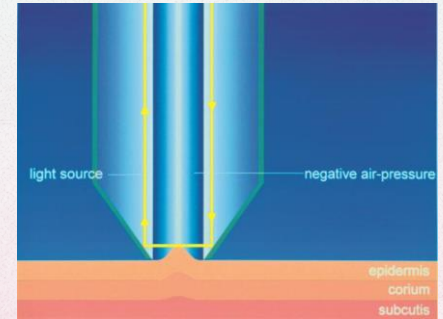
Skin visco-elastic properties

MEASUREMENT:

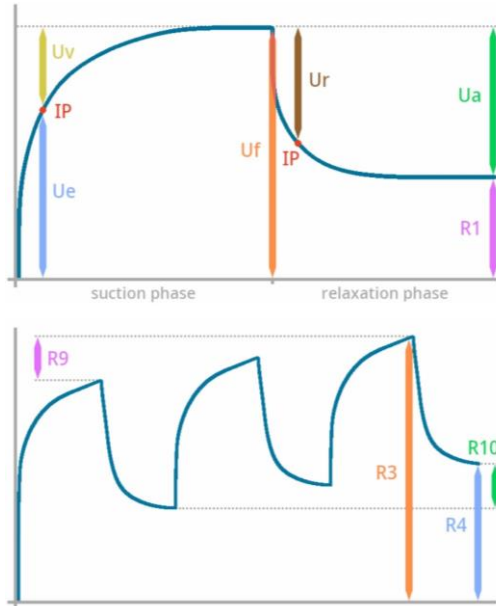
Suction

CLAIMS

- FIRMING EFFICACY
- TONING EFFICACY
- ANTI-AGING EFFECTIVENESS
- REDENSIFYING EFFICACY
- REMODELING EFFECTIVENESS
- PUSH-UP EFFECTIVENESS

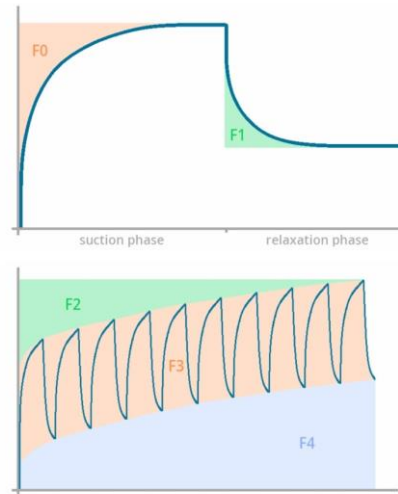


R- Parameters



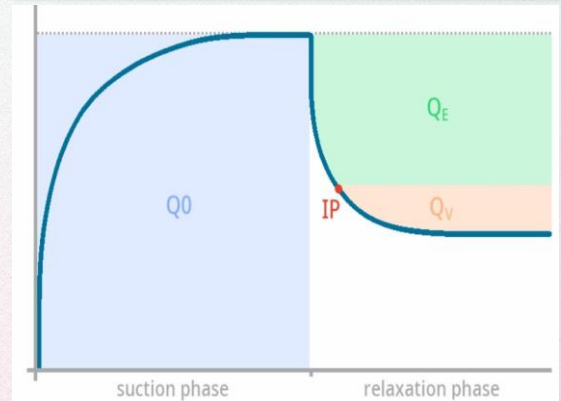
F- Parameters

Area Parameters (F):



- F_1 : Area above the curve during suction phase. The more elastic, the less area there is.
- $F_2/F_3/F_4$: "Fatigue" + "Skin Energy"

Q- Parameters



- Q_0 : Maximum recovery area
- Q_1 : **Total recovery** (overall elasticity) - $(Q_E + Q_R)/Q_0$
- Q_2 : **Elastic recovery** - Q_E / Q_0
- Q_3 : **Viscoelastic recovery** - Q_R / Q_0

SEBUMETER SM 815

APPLICATION:

Sebum **QUANTITATIVE** detection

MEASUREMENT:

Photometry



CLAIMS:

- SEBUM REGULATING
- PURIFYING

SEBUFIX SF 16

APPLICATION:

Sebum **QUALITATIVE** detection

MEASUREMENT:

Reflectance



CORNEOFIX CF 20



APPLICATION

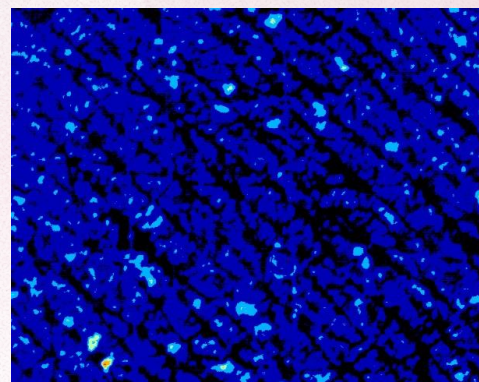
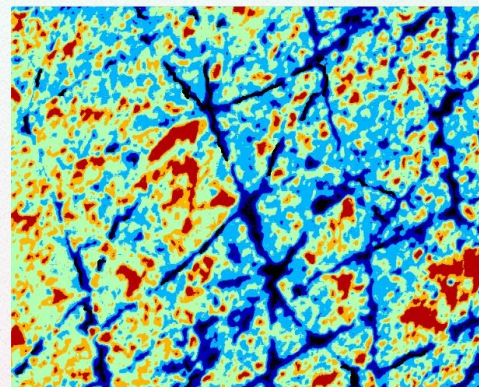
Skin exfoliation

MEASUREMENT:

Photometry

CLAIMS:

- REGENERATING
- EXFOLIATING
- MOISTURIZING
- REBALANCING
- SKIN TURN OVER



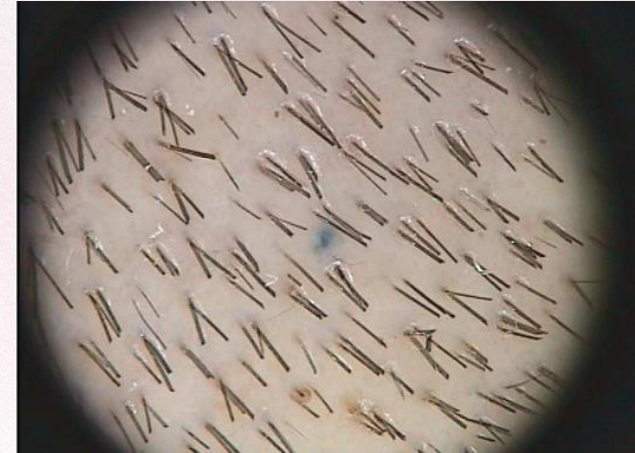
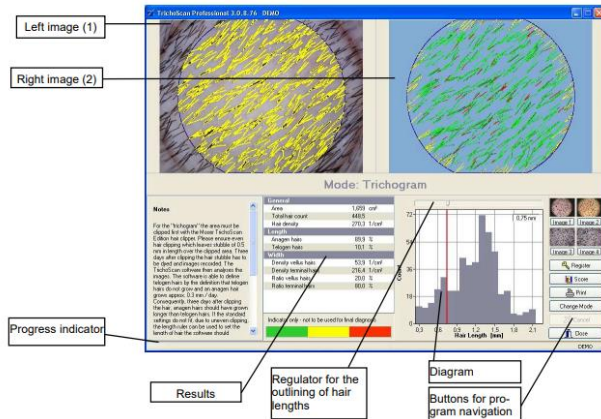
TRICHOSCAN



APPLICATION:

Hair quality and Hair growth

- Terminal and Vellus hair count
- Telogen hair
- Anagen hair
- Hair density
- Hair thickness



T0



T4w



T8w



T12w



BIO-ACTIVE COMPOUND IDENTIFICATION

Natural matrix - Upcycled

Chemical profiling through UHPLC, LC-MS/MS.

Raw materials

Extraction method

Characterization

PERMEABILITY AND SAFETY

IN VITRO

IN VIVO

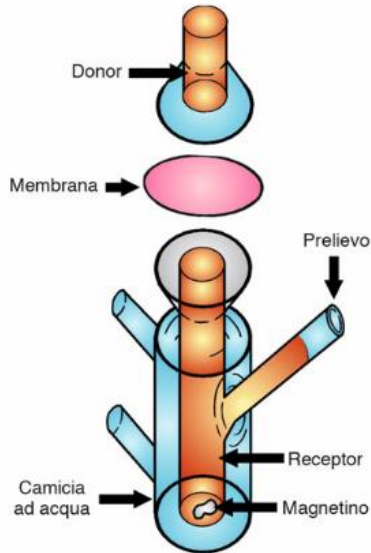
Green technology

Franz cell



SKIN PERMEATION SCREENING

To assess the ability of an ACTIVE to absorb through the skin based on the intrinsic characteristics of the ACTIVE itself, FRANZ CELLS are used:



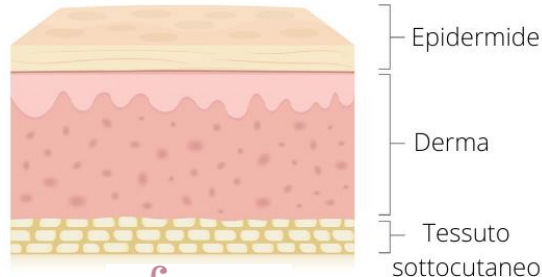
Donor -> the formulation to be analyzed

Receptor -> the recipient phase (PBS)

Membranes -> natural (animal skin) or artificial (silicone, cellulose)



- The poorly permeable active will remain confined within the membrane and its effect will be purely local.
- The active that can cross the membrane will have the effect systemically.



The passage through the skin of active ingredients applied to its surface is regulated according to their chemical and physical characteristics and those of their vehicle or base.

Nutricosmetics



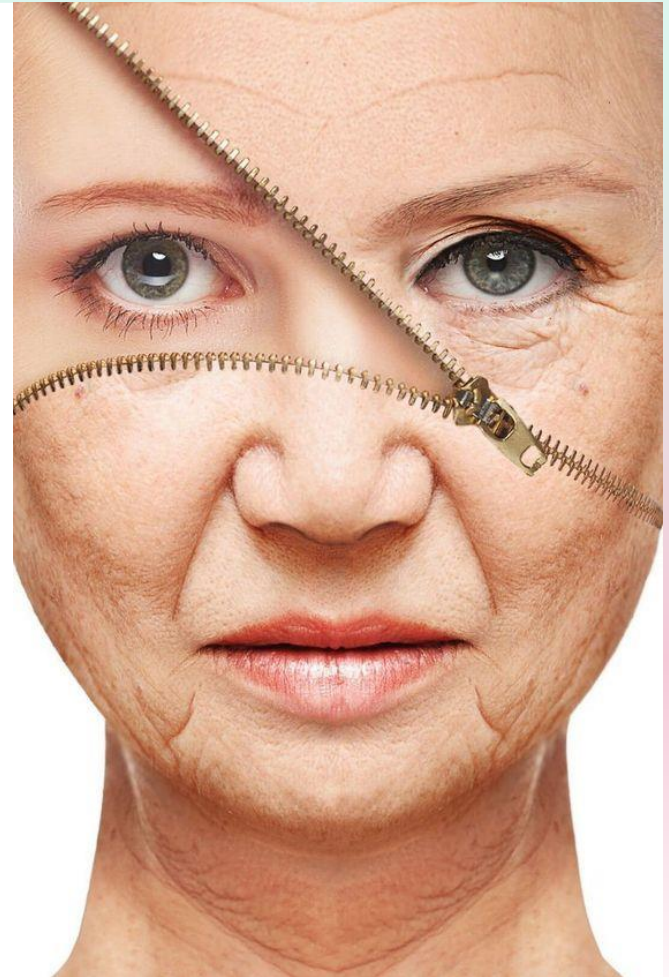
HOW TO PERFORM AN EFFICACY TEST FOR A NUTRICOSMETIC

- EXTRACTION
- CHARACTERIZATION
- TRANSDERMAL ABSORPTION
- FORMULATION
- IN VITRO ACTIVITY
- IN&OUT IN VIVO EFFICACY

Beauty comes from the inside

**IS THERE SYNERGY BETWEEN SUPPLEMENTS
AND COSMETICS?**

Is really the Inside&Out Strategy
a valid approach?



RESEARCH PROJECTS on NUTRICOSMETICS

DERMOCOSMETIC EVALUATION OF TOPICAL FORMULATIONS CONTAINING:

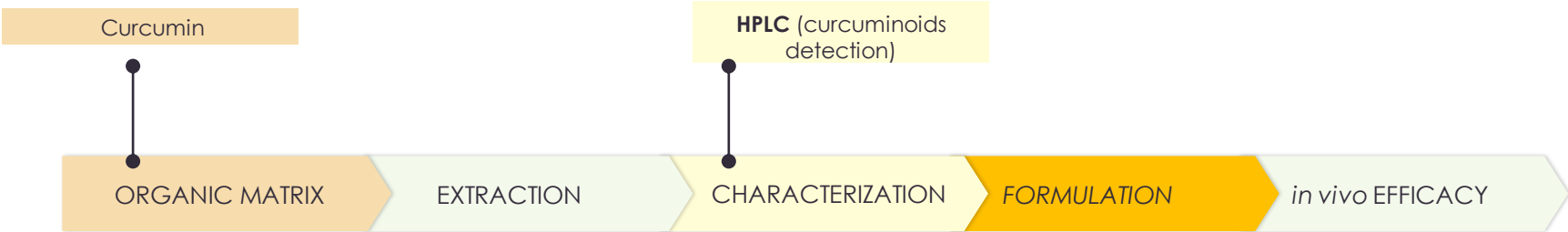
CURCUMIN

URSOLIC ACID

Cucurbita pepo L.
flowers



DERMOCOSMETIC EVALUATION OF A FORMULATION CONTAINING **TURMERIC**



RESEARCH ARTICLE
Dermocosmetic evaluation of a nutricosmetic formulation based on *Curcuma*

Ritamaria Di Lorenzo, Lucia Grumetto, Antonia Sacchi, Sonia Laneri ✉ Irene Dini ✉

First published: 12 December 2022 | <https://doi.org/10.1002/ptr.7705> | Citations: 1

DERMOCOSMETIC EVALUATION OF A FORMULATION BASED ON **URSOLIC ACID**



Annurca Apple (AA)

Lyophilisation



Lyophilised Annurca Apple (LAA)

+



Sunflower oil as biocompatible and green extraction solvent

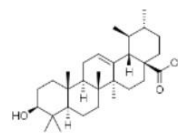
Optimization of Ursolic acid using Response Surface Methodology (RSM)

Optimised extraction parameters:

- ❖ Extraction time, 63 h
- ❖ Extraction Temperature, 68.85 °C



OAAO (Optimized Annurca Apple Oleolyte)



Maximum Ursolic acid yield in RSM condition:
784.40 ± 7.579 (µg/mL)



- ✓ Qualitative Polyphenolic and Terpenoid Analysis by HPLC-DAD-HESI-MS/MS of OAAO
- ✓ Quantitative Polyphenolic and Terpenoid Analysis by HPLC-DAD-FLD
- ✓ OAAO Antiradical activity estimated by DPPH and ABTS assays

Skin permeation study using Franz cells model



Work in progress



DERMOCOSMETIC EVALUATION OF A FORMULATION BASED ON **Cucurbita pepo L. flowers**

MYRECETIN

p-COUMARIC

QUERCETIN

ISORAMNETIN

UHPLC and Orbitrap HRMS
Analysis

- FRAP
- ABTS
- DPPH

in vitro

Flowers

ORGANIC MATRIX

EXTRACTION

CHARACTERIZATION

FORMULATION

EFFICACY

Submitted

- Barrier restoring / Moisturizing
 - Anti-spot
- Depigmenting

in vivo

T0



T2w



T4w





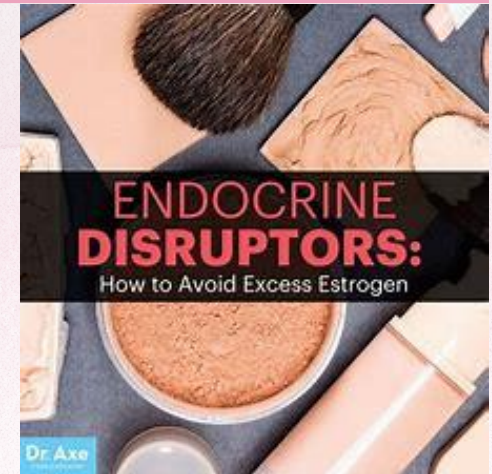
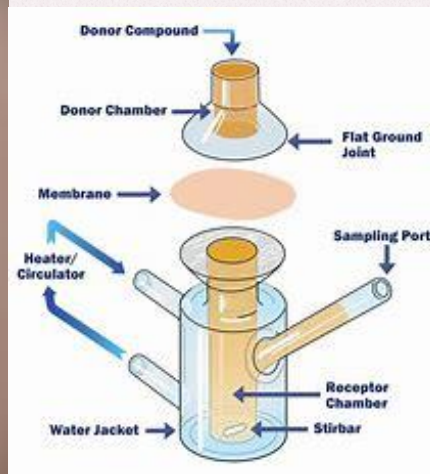
Tossicologia in Cosmetici

Safety test

Patch test (48 or 96hr)

Transdermic Absorption -> Toxicology / Efficacy

Pollutants detection (Metals or EDC)



GRAZIE PER L'ATTENZIONE

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Email: ansacchi@unina.it; slaneri@unina.it; ritamaria.dilorenzo@unina.it

