

Introduction to Cosmetic Active Ingredients

What place for Marine Biotechnologies ?

Rémi Laville, Ph.D
Ingredients R&D Director
Cosmo International Ingredients





Creativity from Nature

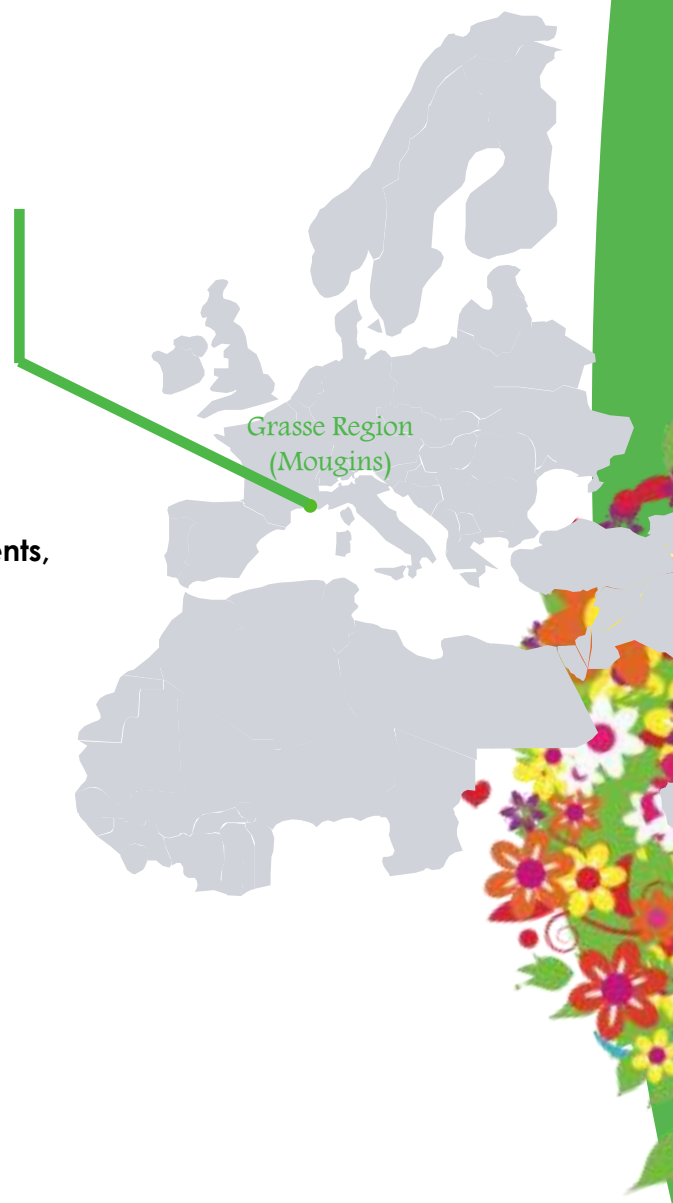




Fort Lauderdale



Cosmo International Fragrances
created in 2012 its own
Research Center on Natural Ingredients,
Cosmo International Ingredients



Grasse Region
(Mougins)



Mougins, FRANCE



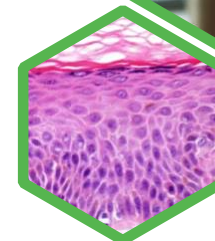
INSPIRED BY NATURE, ACHIEVED WITH SCIENCE



Perfumery



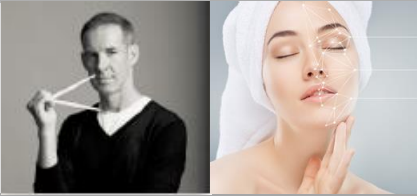
Cosmetic



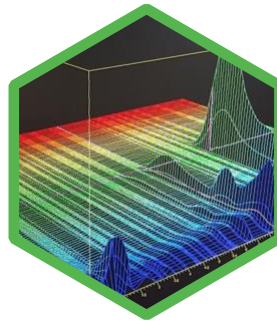
▶ 2 segments



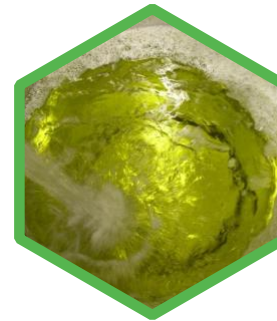
Cosmo GROUP
Interest DRIVEN



ETHICAL
SOURCING



SCIENTIFIC PROOF



ECO DRIVEN
EXTRACT



SAFE



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Welcome to the cosmetics world

« Competitive Customer Driven Market »



Natural Active Cosmetic Ingredients



Welcome to the cosmetics world



- Product Identification: Natural, Sustainable, Rare (unique).
- Skin Efficacy: molecular proof, efficacy test in-vitro for client in-vivo for customer.
- Safety: full innocuity.

| **PREMIUM INGREDIENTS**



Welcome to the cosmetics world

- Product Identification: Natural, Sustainable, Rare (unique).





COSMO

International Ingredients

A story to touch the customer

Travel, escape from everyday life ...



Las h

“Se di
curati
logra
visita

dades
e ha

Rare and unique gift just for you...



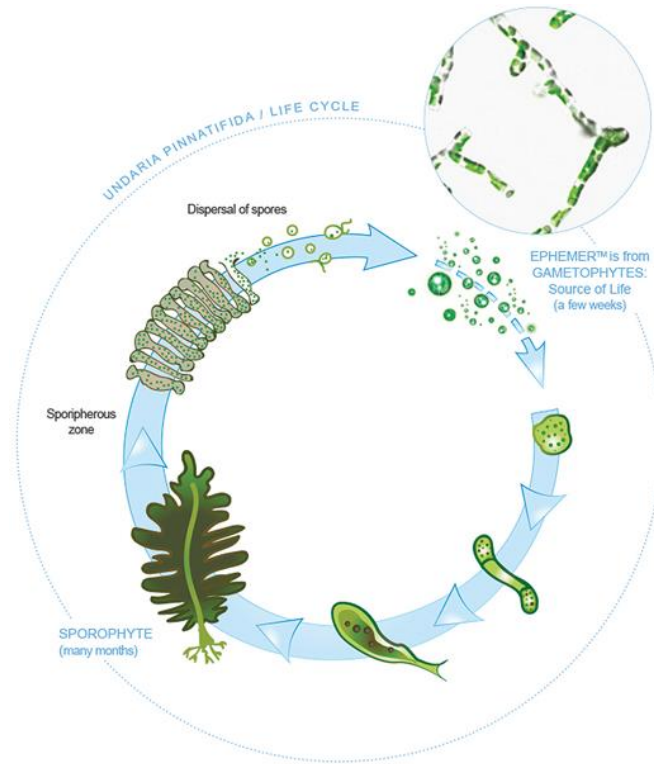
Roman Kaiser (Perfumer, Givaudan)
Equatorial Rain Forest,
new fragrances research on treetops



Roman Kaiser (Perfumer, Givaudan)
Equatorial Rain Forest,
new fragrances research on treetops



SUSTAINABILITY

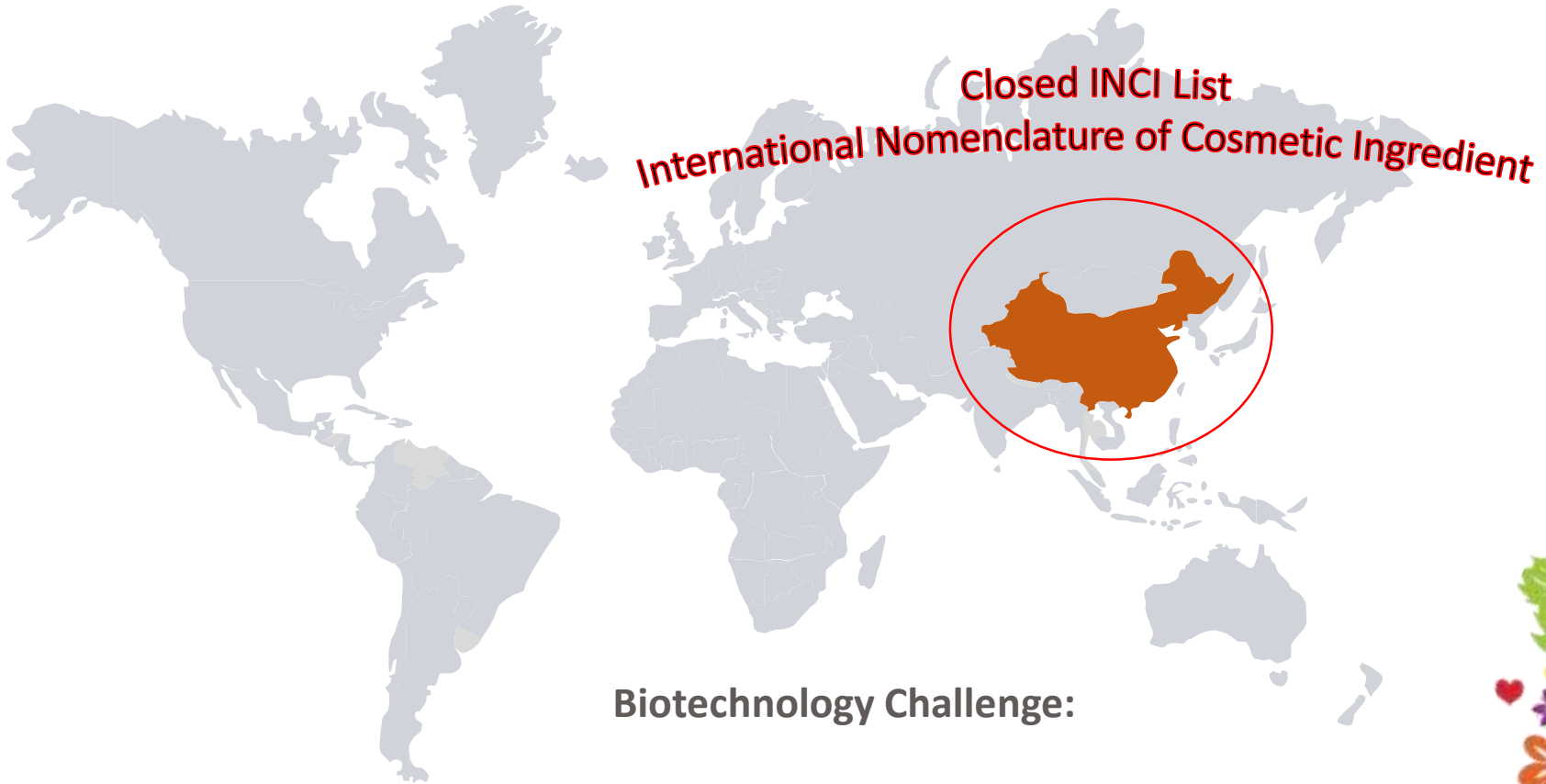


- No impact in biodiversity and environment
- Controlled quality (no seasonality, no weather issues)
- **Warning: still needs access to genetic resources (Nagoya protocol)**



A Thorn in the Side of Cosmetics Active R&D and Business

Closed INCI List
International Nomenclature of Cosmetic Ingredient



Biotechnology Challenge:

Do different with the same !



Innovation China Compliant !



Welcome to the cosmetics world



- Skin Efficacy: molecular proof, efficacy test in-vitro for client in-vivo for customer.

Welcome to the scientific side



In-vivo
efficacy



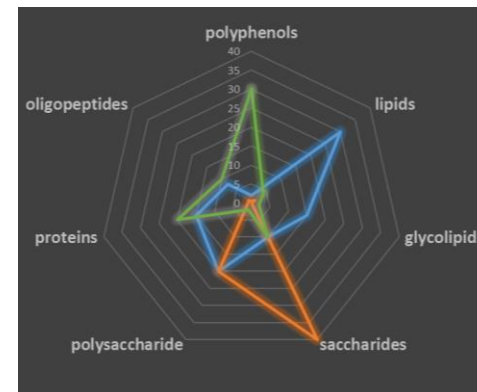
Phytotherapeutic Approach

Systemic point of view.

Whole plant better than
isolated molecules.

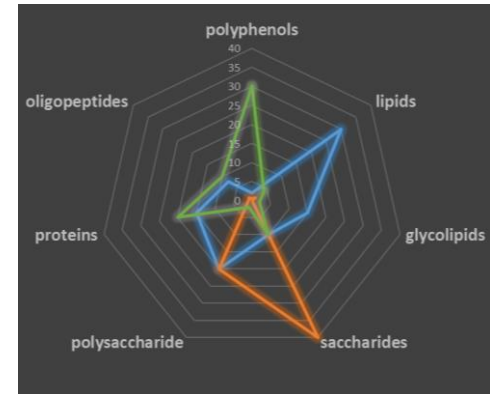
Natural and Healthy Trend.

Phytochemical
Proof

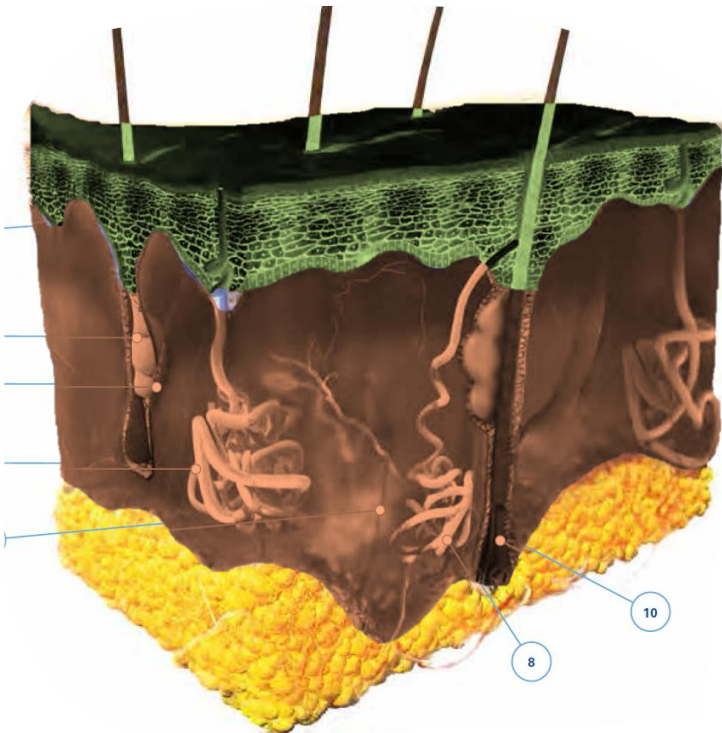


Phytotherapeutic Approach

The whole phytochemical machinery for global action to afford well-being and beautiful and healthy skin.



Standard Analytical methods



1 EPIDERMIS, Keratinocytes (moisterizing)

- glycolipids, saccharides, lipids...

2 DERMIS, fibroblast (anti-ageing)

- polyphenols, proteins, peptides,

- Close to ancestral treatment (ointment)

- Close to what nature offers



Concept Easily applicable to marine biotechnologies

Example:

- Cryogrinding (arkopharma)



“To extract the best from each plant, i.e. all its active ingredients, Arkopharma Laboratories uses a high-technology process called cryogrinding. Cryogrinding is pulverizing the active part of the dried plant by grinding it in the cold using liquid nitrogen at -196 °C. A very fine, even powder is collected this way – this is total plant powder”

- Stem Cell (Mibelle Biochemistry, PhytoCellTec™)

Malus domestica (apple) stem cells.

- human stem cell protection
- reversal of fibroblasts ageing symptoms
- Retarding of the insulated hair follicle ageing
- Anti-wrinkle action (Crow’s feet)



Two forms:

Lysed stem cell dispersion in glycerine or polar/apolar extract preparation



In-vivo
efficacy

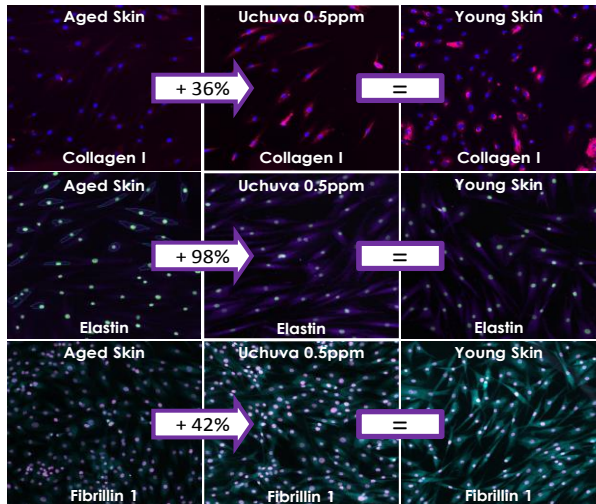


Mechanism of action
« demonstrated »

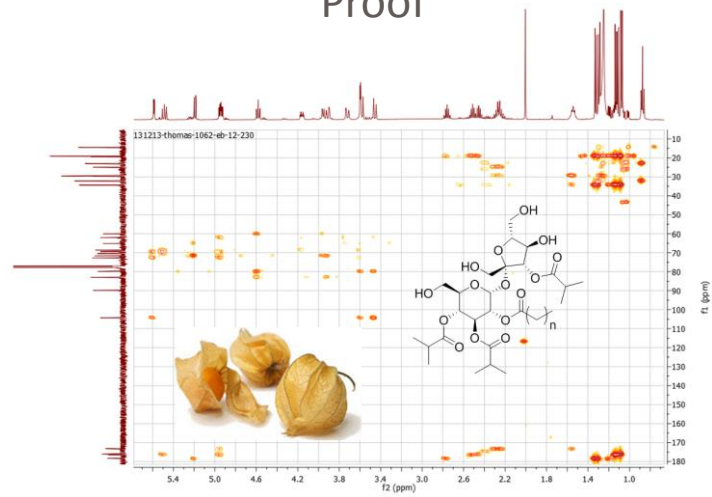
Pharmaceutic Approach

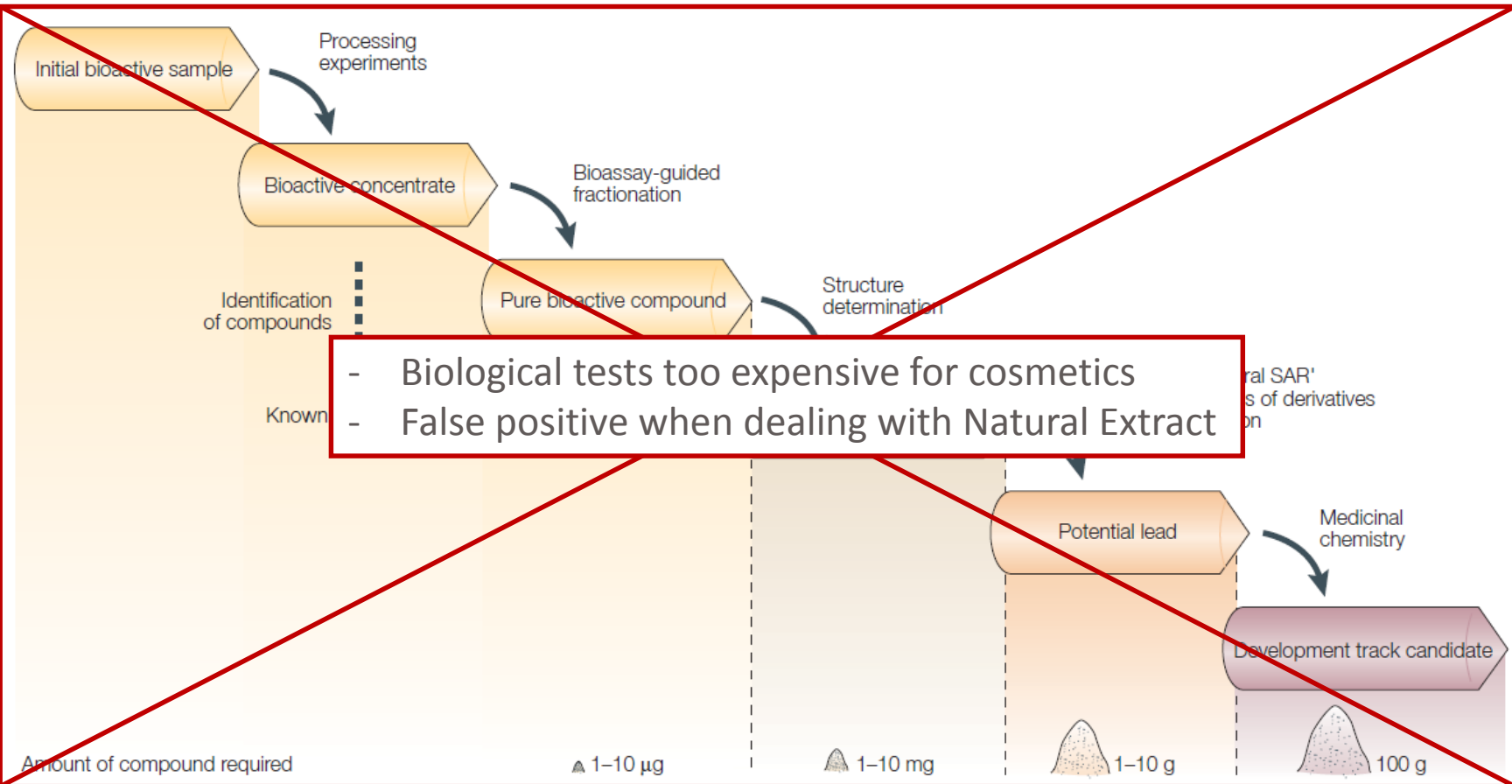
Specific activity with a specific
compound

In-vitro
Concept



Phytochemical
Proof



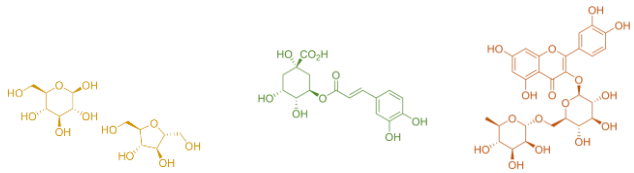


Study the phytochemical profile to target one or a family of compounds during extraction.
Criteria: novelty, originality, interesting known bioactivities.

GOAL: To claim active compounds on a biological target like in pharmaceutical field

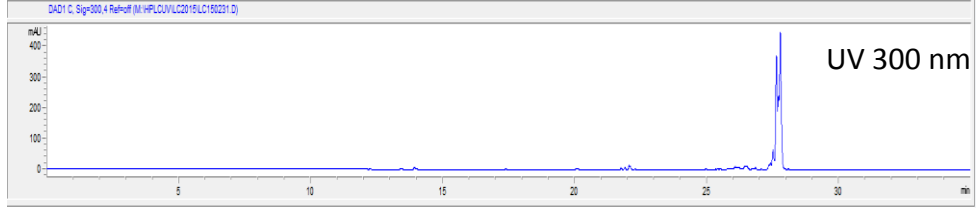
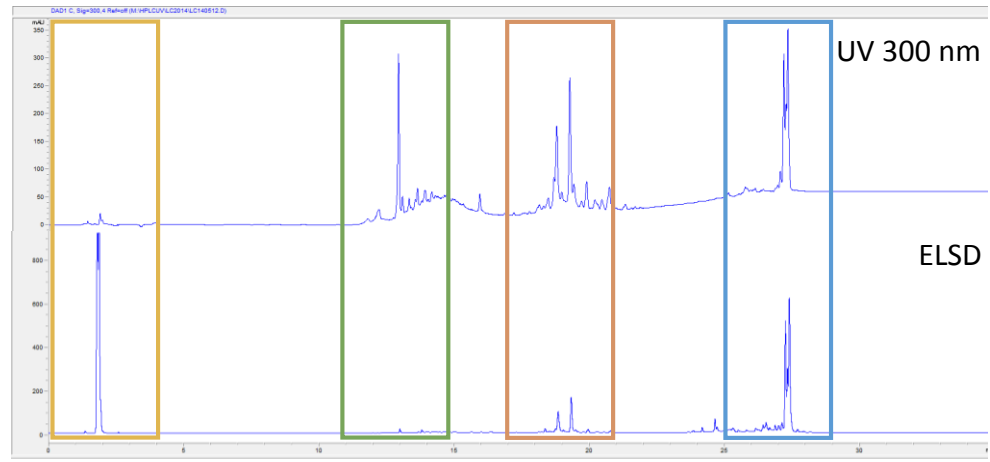


Pharmaceutical Approach



Original active compounds firstly described in this plant

Full phytochemical profil



Final Ingredient

- Active Compounds Content (specific analytical method)



Confidential

HPLC conditions : Column Phenomenex Gemini C18 150x4,6 mm, 3 μm; Flow at 1 mL/min 100%; Gradient : 100% of A1 (H₂O/CH₃CN 95:5) for 8 min then up to 100% of B1 (CH₃CN/iPrOH 20:80) during 25 min and remains at 100% of B1 for 10 min.

Pharmaceutical Approach



ker:

THERAPEUTICS BJD British Journal of Dermatology

A cosmetic 'anti-ageing' product improves photoaged skin: a double-blind, randomized controlled trial

R.E.B. Watson, S. Ogden, L.F. Cotterell, J.J. Bowden, J.Y. Bastrilles, S.P. Long* and C.E.M. Griffiths
 Dermatological Sciences Research Group, School of Translational Medicine, Faculty of Medical and Human Sciences, The University of Manchester, Oxford Road, Manchester M13 9PT, U.K.
 *Alliance Boots Ltd, Nottingham NG2 3AA, U.K.

Note added after online publication:
 Since the publication of this article online on 28 April 2009, the authors wish to recognize the following changes to the article:

Title: Effects of a cosmetic 'anti-ageing' product on photoaged skin

Conflicts of Interest: This study was funded by Alliance Boots Ltd.

Summary

Methods For the patch test, commercially available test product and its vehicle were applied occluded for 12-days to photoaged forearm skin (n = 10) prior to biopsy and immunohistochemical assessment of fibrillin-1; all-trans retinoic acid (RA) was used as a positive control. Sixty photoaged subjects were recruited to the RCT (test product, n = 30 vs. vehicle, n = 30; once daily for 6-months; face & hands) with clinical assessments performed at recruitment and following 1-, 3- & 6-months of use. Twenty-eight subjects had skin biopsies (dorsal wrist) at baseline and at 6 months of treatment for immunohistochemical assessment of fibrillin-1 (test product, n = 15; vehicle, n = 13). All subjects received test product for a further 6-months. Final clinical assessments were performed at the end of this open period; 27 subjects received test product for 12-months.

Results In the 12-day patch test assay, we observed significant immunohistological deposition of fibrillin-1 in skin treated by test product and RA as compared to untreated baseline (P = 0.005 and 0.015 respectively). In the clinical RCT, at 6 months, compared to baseline assessment, 43% of subjects on test product had an improvement in facial wrinkles (P =

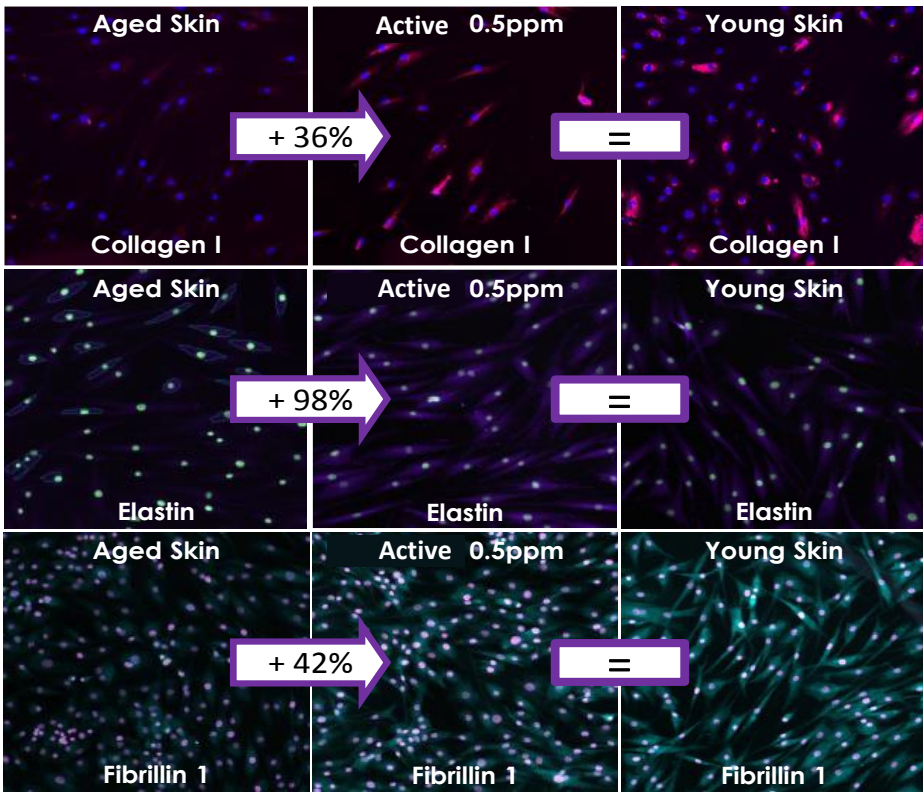
Between group comparison was a significant benefit (P = 0.005) as determined by the paired Wilcoxon rank-sum test. At 12 months, there was no significant difference between test product and vehicle in facial wrinkles (P = 0.15).
Conclusion An over-the-counter cosmetic 'anti-ageing' product demonstrated clear benefit over vehicle in fibrillin-1 deposition over a 6-month trial period. There was a corresponding but non-significant trend towards clinical improvement in facial wrinkles. Clinical improvements in the treated group were increased after a further 6-months of use. This study demonstrates that a cosmetic may improve the appearance of wrinkles and further supports the use of fibrillin-1 as a robust biomarker for repair of photoaged dermis.

Specific fibroblast ageing biomarker

Use of in-vitro test for biological activity proof
 Target specific marker



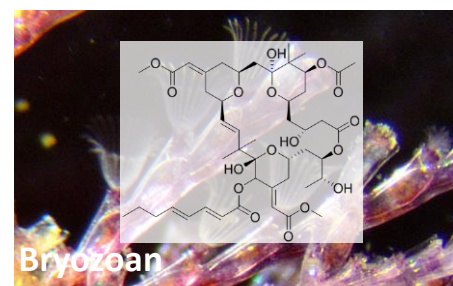
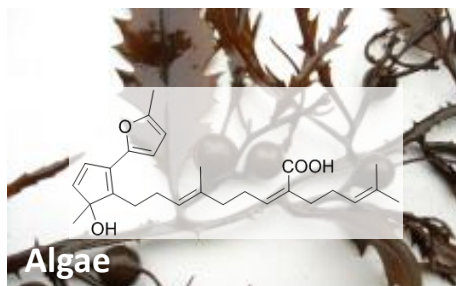
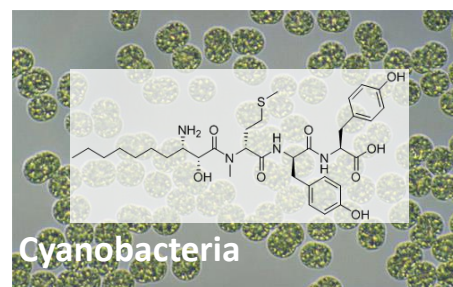
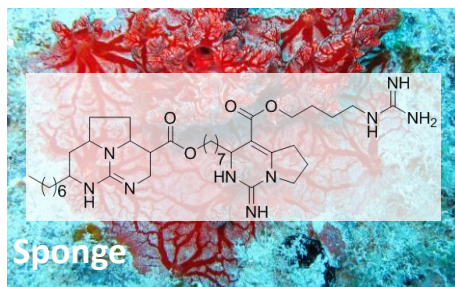
In-vitro
In-vivo



Marine Biotechnology Strength

Rich chemodiversity of Marine Natural Products in small MW active compounds:

- Alkaloids
- Peptides
- Terpenoids
- Polyketides



- Diverse Organism Origin for Diverse Compounds
- Enrich intrinsic chemodiversity (Metabolic Pathway Orientation/Design)

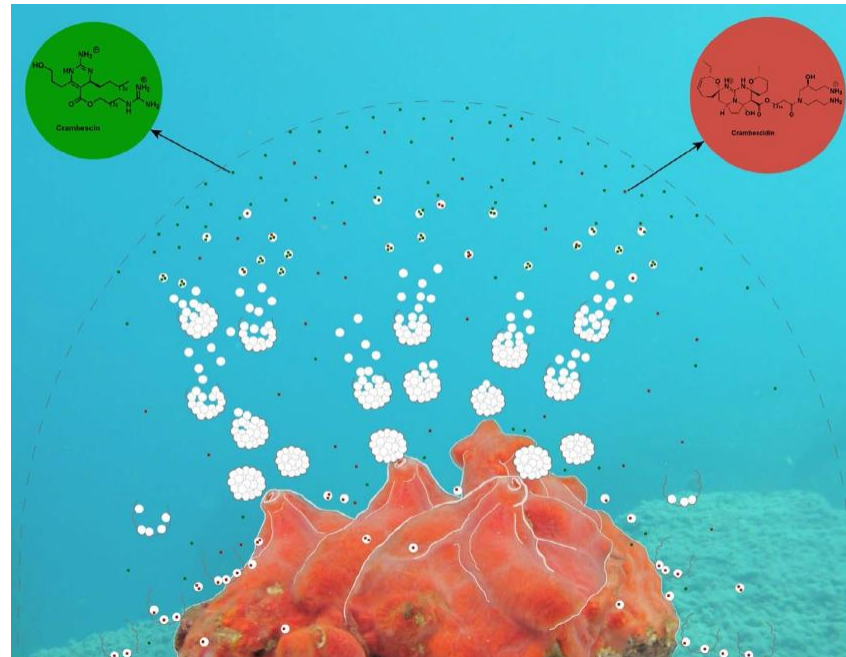




Marine Biotechnology Strength

BAMMBO: A SPONGE-MILKING FACTORY

The blue growth project aims to retrieve the many bio-active compounds of sponges in a sustainable manner



Marine Biotechnology Innovation : Watch the gap between Innovation and Regulatory



COSMOS-standard



This Standard has been developed at the European and international level by BDIH (Germany), COSMEBIO & ECOCERT (France), ICEA (Italy) and SOIL ASSOCIATION (UK) who are the founders of the COSMOS-standard AISBL (an international non-profit association registered in Belgium) in order to define **common requirements and definitions for organic and/or natural cosmetics.**

“ ... may use ingredients derived from culture or fermentation and other **non-GMO biotechnology**, the cultures must use only feedstock from **natural vegetable or microbial raw materials without using genetically modified organisms or their derivatives.**”

“ It is allowed to use ingredients of animal origin as long as:
they are produced by animals **but are not a part of the animal**, and
they **do not entail the death of the animal** concerned.”



Thank You For Your Attention...
And Have Good Brainstormings !



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