

Science and cosmetics – from idea to product

Renata Dębowska, PhD

Dr Irena Eris Centre for Science and Research

Scope of Activity

R&D

Dr Irena Eris Center for Science and Research

PRODUCTS

Face and body care cosmetics

SERVICES

Dr Irena Eris Skin Care Institutes chain (24 Institutes)

Dr Irena Eris Hotel & SPA Krynica Zdrój

Dr Irena Eris Hotel & SPA Wzgórza Dylewskie



How modern and effective cosmetics are developed?

Department for Research and Development



Science Council



Centre for Science and Research



Technological – Implementation Laboratory



In vitro
Laboratory

In vivo Laboratory

The basis of every innovative formula lies in our research

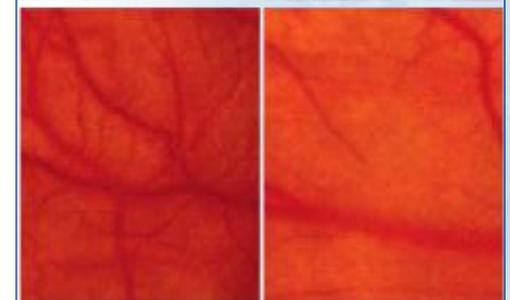
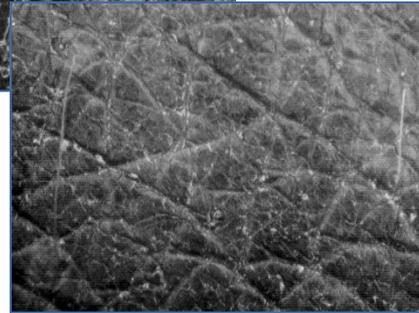
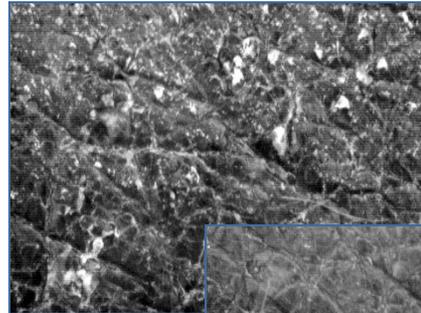
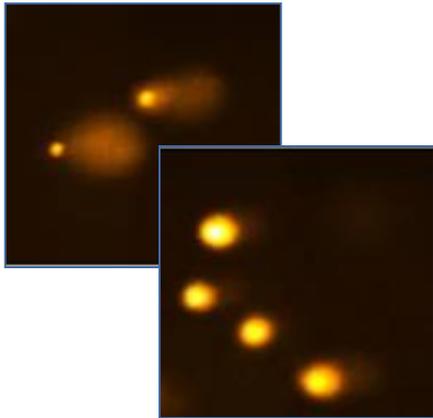


Dr Irena Eris

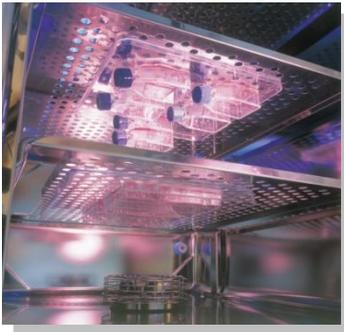
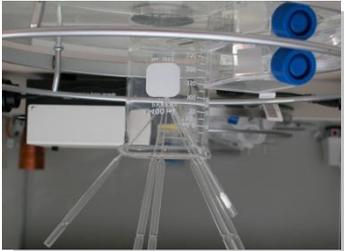
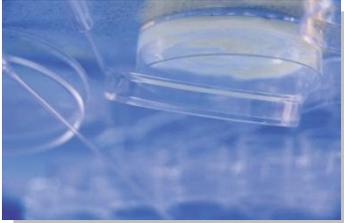
Efficacy

Product efficacy based on

- ◆ in vitro and ex vivo evaluations
- ◆ in vivo testing



In vitro/ex vivo research



- search for new application of raw materials and their activity
- testing the substances which have potential application in personal care and have never been used in cosmetic products
- creating the complexes of active compounds and choosing the best ones

In vivo testing

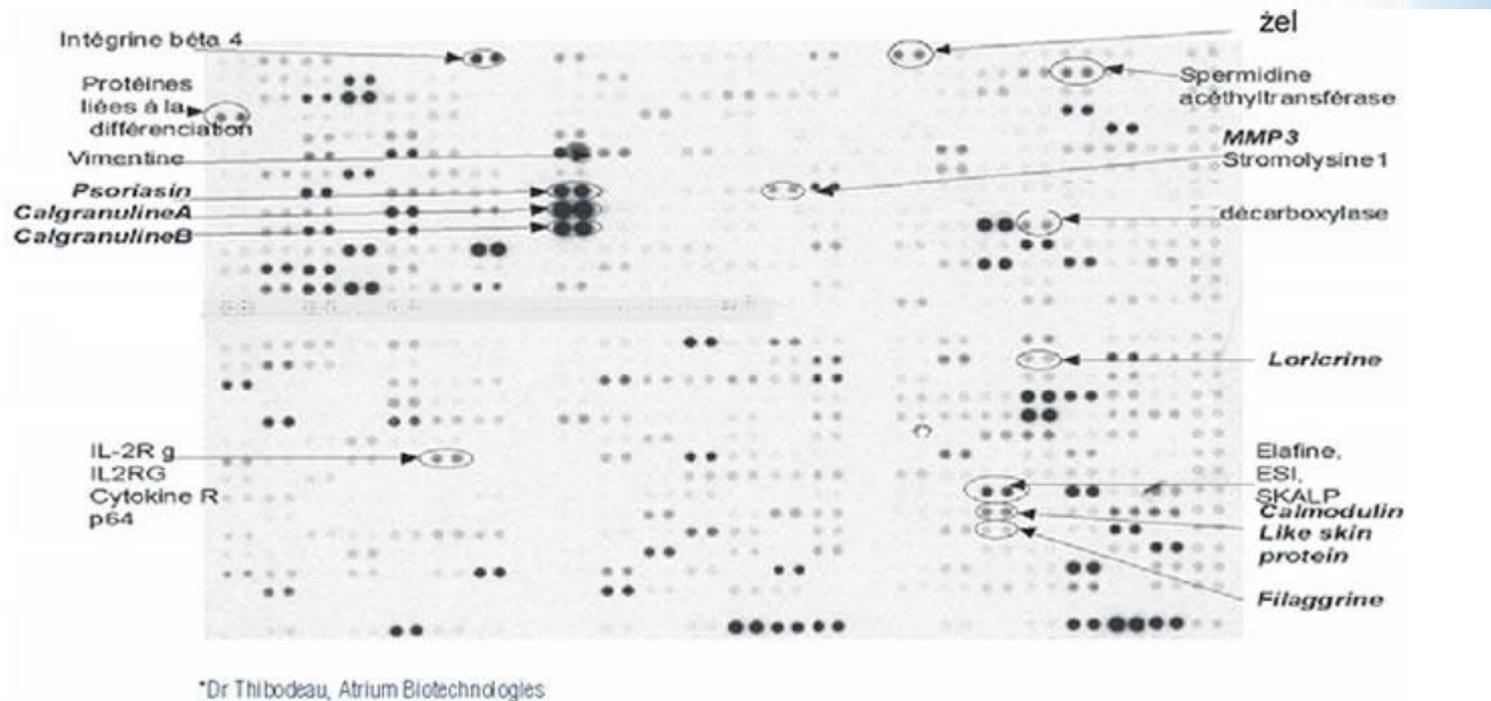


- **One of the biggest volunteers database for cosmetics testing**
 - **over 3000 volunteers**
 - **women and men: age 13-80**
 - **wide range of skin types including the problematic ones - acne, rosacea, psoriasis and others**
- **Cooperation with scientific centres in Poland and abroad**
- **Presentation of research results at many international science conferences**

Challenges

Molecular analysis (micro array, gene expression)

The effect of Blue Retinol on gene expression related to epidermis differentiation



Blue Retinol regulates the process of epidermis differentiation.



Dr Irena Eris

Challenges

Molecular analysis (micro array, gene expression)

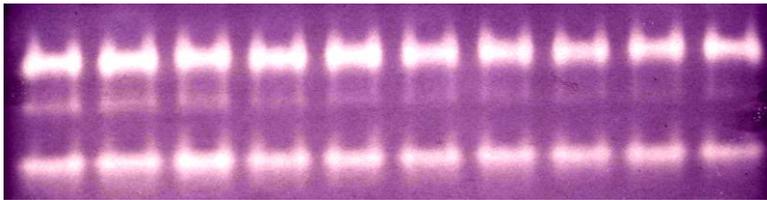
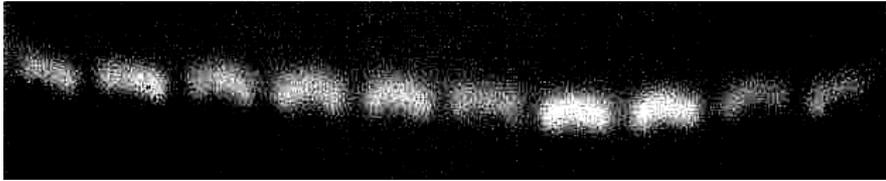
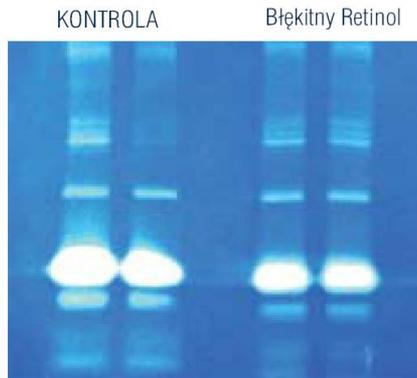
The effect of actives on gene expression related to vascular chain growth



- Alg complex (extract from *Ascophyllum nodosum*, *Asparagopsis*)
- Matrix metalloproteinases inhibitors (extract from *Macrocystis pyrifera*)

Challenges

Enzymes activity (MMP, SOD, catalase, GSH, others)



Anty-free radical properties:

- Free radical trapping molecules
- Enzymatic defence systems (superoxide dismutases SOD, catalase, peroxidase)

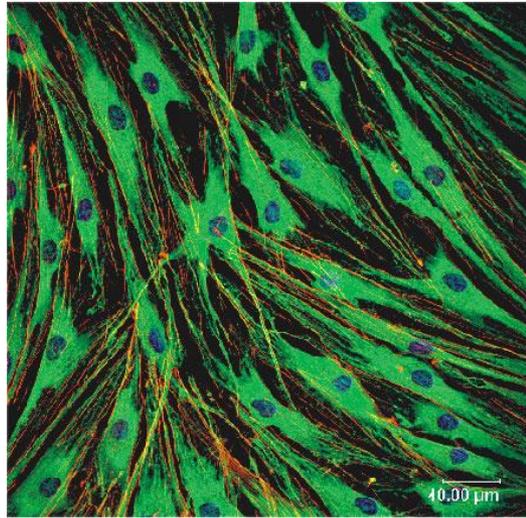


Dr Irena Eris

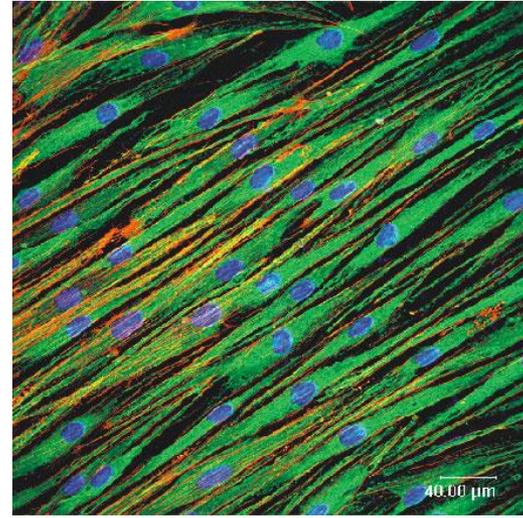
Challenges

Microscopy (TEM, confocal, fluorescent, atomic force)

Stimulation of the fibroblasts' division – structurally younger skin



Control



Blue Retinol

Thanks to Blue Retinol cells keep the shape of young, metabolically active ones.

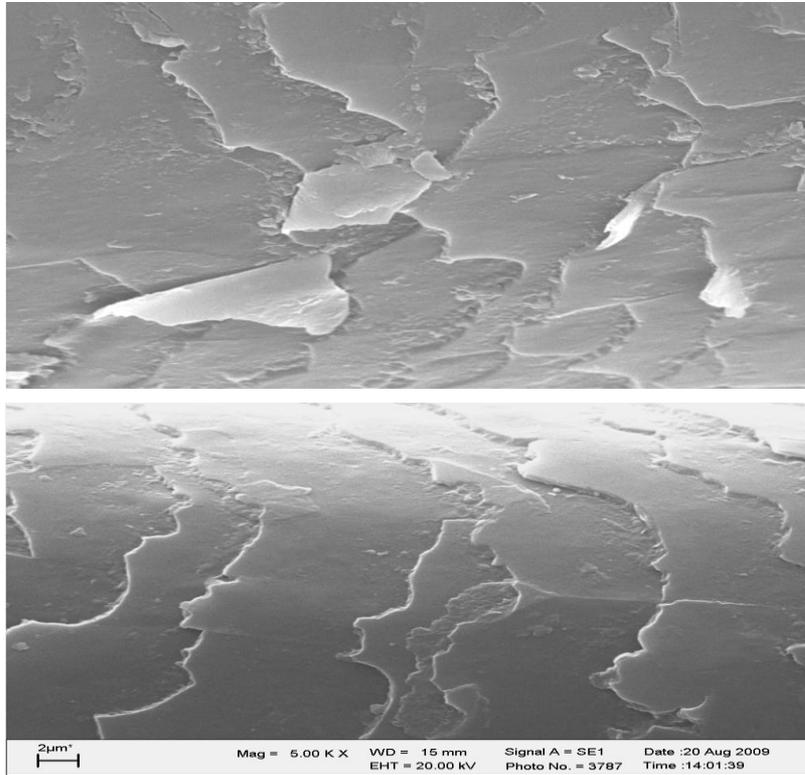


Dr Irena Eris

Challenges

Microscopy (TEM, confocal, fluorescent, atomic force)

Hair surface analysis, mag. 5000 x



Before use of
conditioner

After one use of
conditioner

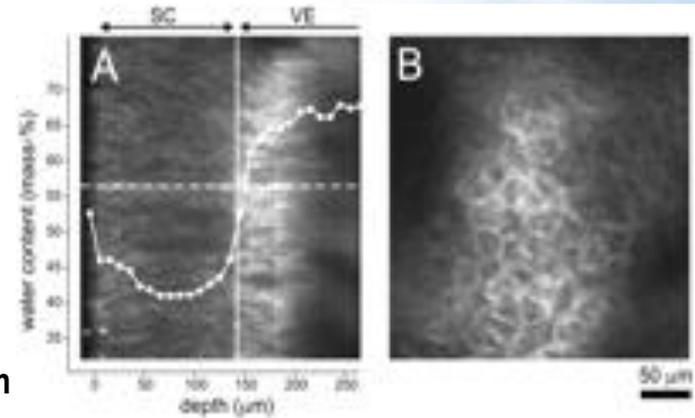
Challenges

Spectroscopy (e.g. Raman)

Water level in epidermis

(A) Cross section of the skin (xz-plane; **SC**: stratum corneum; **VE**: viable epidermis). Plotted in the image is the water concentration profile as determined from Raman measurements on the dashed line.

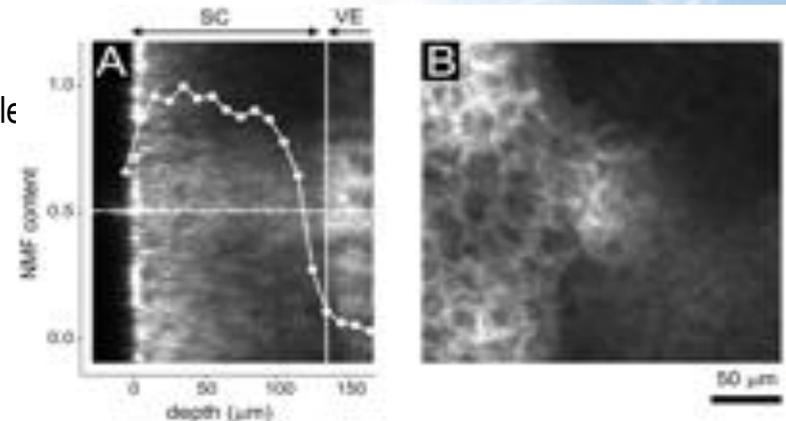
(B) Confocal image parallel to the skin surface (xy-plane), recorded at **145 μm below the skin surface** at the boundary between SC and VE.



NMF level in epidermis

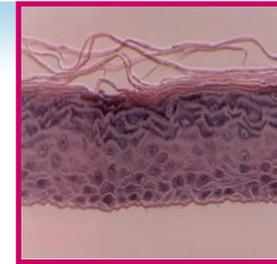
(A) Cross section of the skin (xz-plane; **SC**: stratum corneum; **VE**: viable epidermis).

(B) Confocal image parallel to the skin surface (xy-plane) recorded **135 μm below the skin surface** at the boundary between SC and VE.



Challenges

Alternative methods for safety assesment



Safety assesment on EpiDerm model

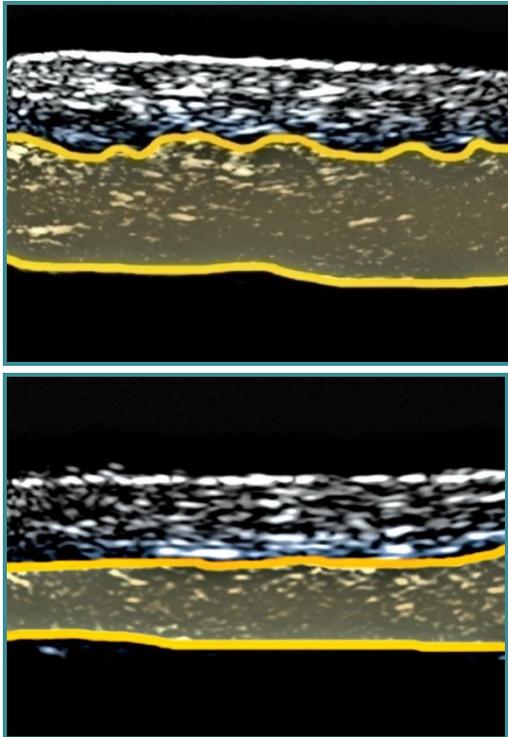


Dr Irena Eris

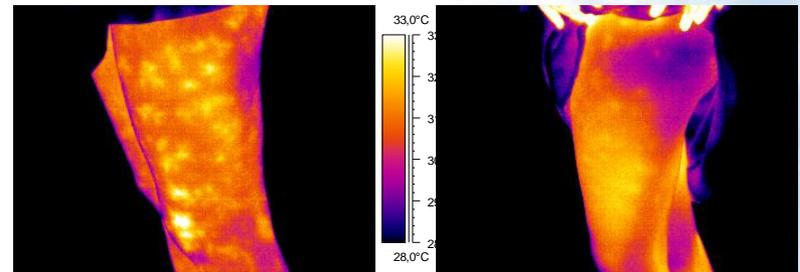
Challenges

Clinical trials

USG evaluation of product effectiveness



Corrective make-up



Termographic analysis of the skin of the thighs,
THERMA CAM 595 Flir Systems AB



Dr Irena Eris

Needs of cosmetic industry

- Close work with scientists
- Financial support (grants, EU assistance)

What is crucial:

- Knowledge
- Laboratory Equipment



Dr Irena Eris



Thank you