

# Science and cosmetics – from idea to product

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# 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

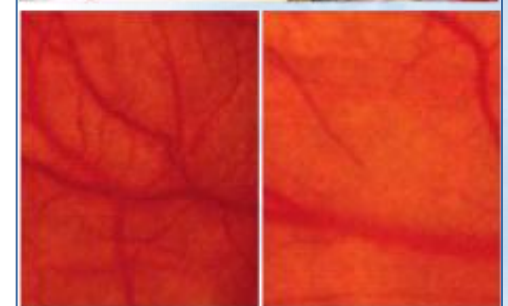
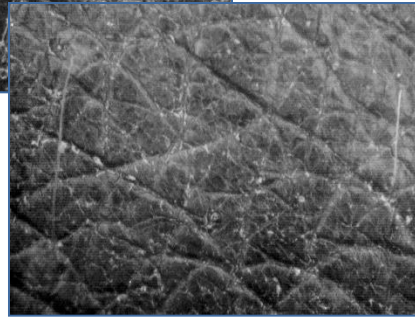
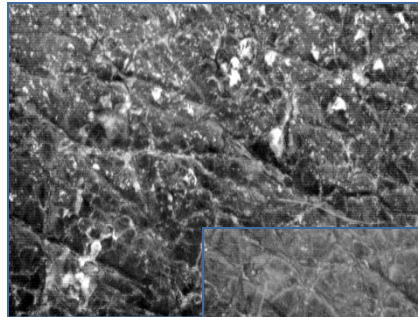
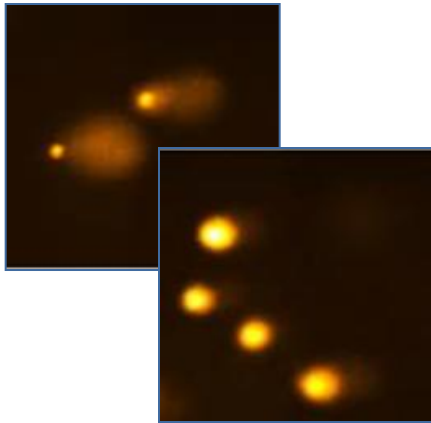
*In vivo* Laboratory

The basis of every innovative formula lies in our research

# Efficacy

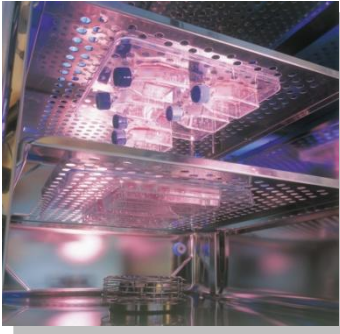
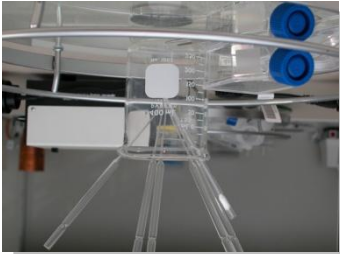
Product efficacy based on

- ◆ 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

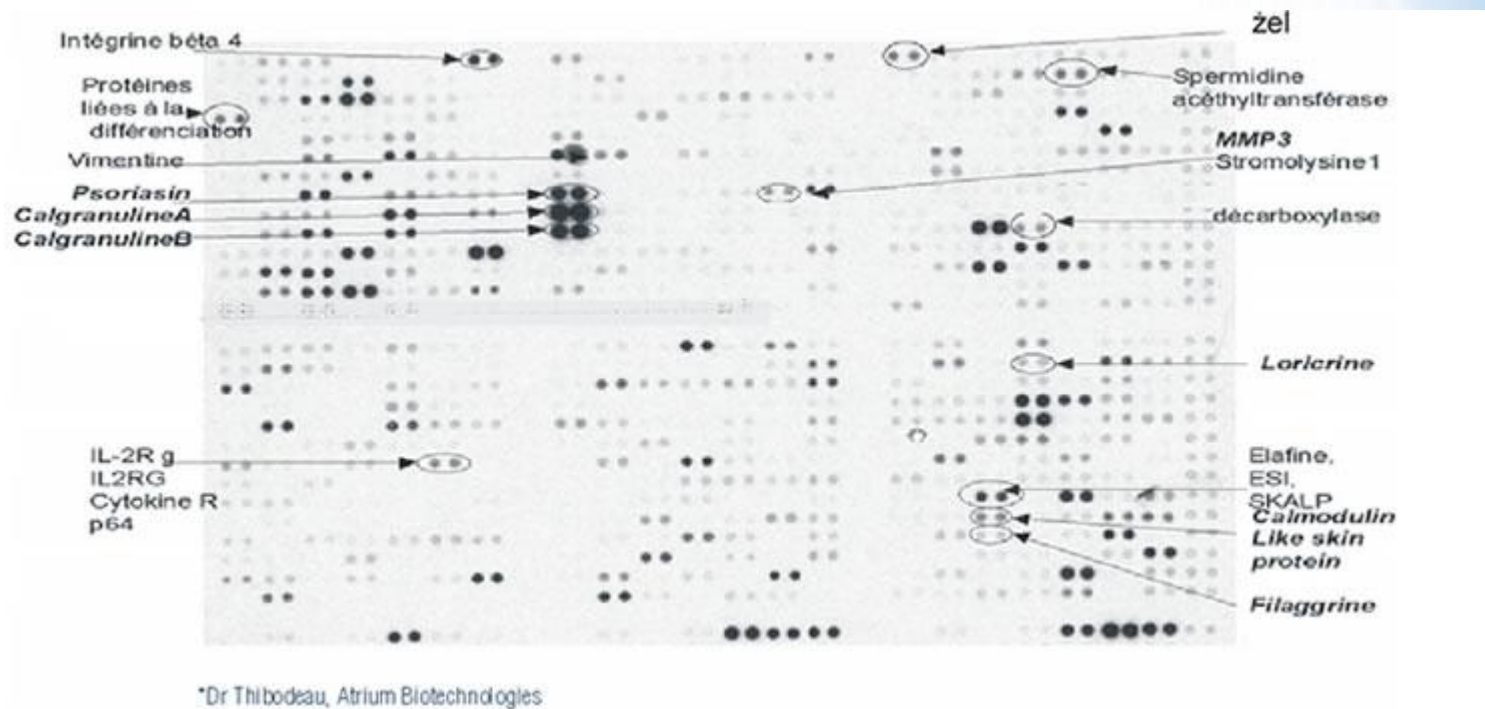


- **One of the biggest volunteers database for cosmetics testing**
  - **over 3000 volunteers**
  - **women and men: age 13-80**
  - **wide range of skin types including the problematic ones - acne, rosacea, psoriasis and others**
- **Cooperation with scientific centres in Poland and abroad**
- **Presentation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



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# Challenges

## Molecular analysis (micro array, gene expression)

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

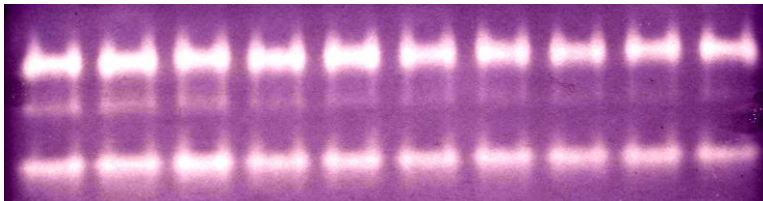
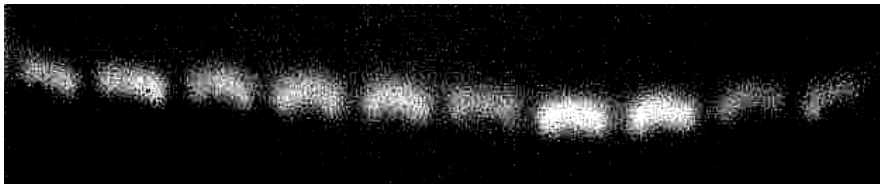


- Alg complex (extract from *Ascophyllum nodosum*, *Asparagopsis*)
- Matrix metalloproteinases inhibitors (extract from *Macrocystis pyrifera*)



# Challenges

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



Anty-free radical properties:

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

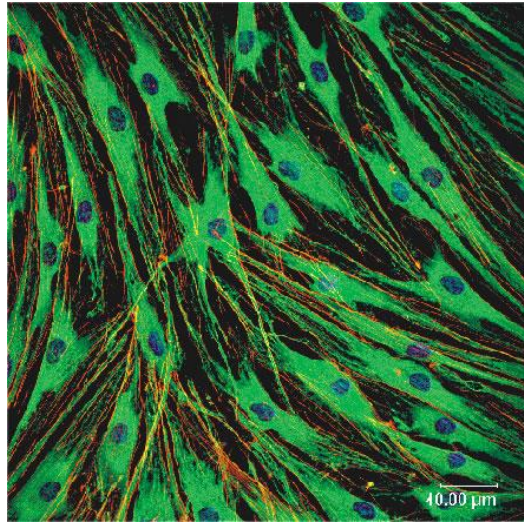


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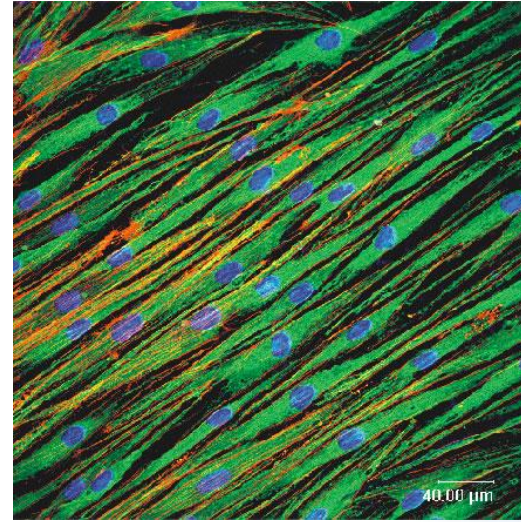
# Challenges

Microscopy (TEM, confocal, fluorescent, atomic force)

Stimulation of the fibroblasts' division – structurally younger skin



Control



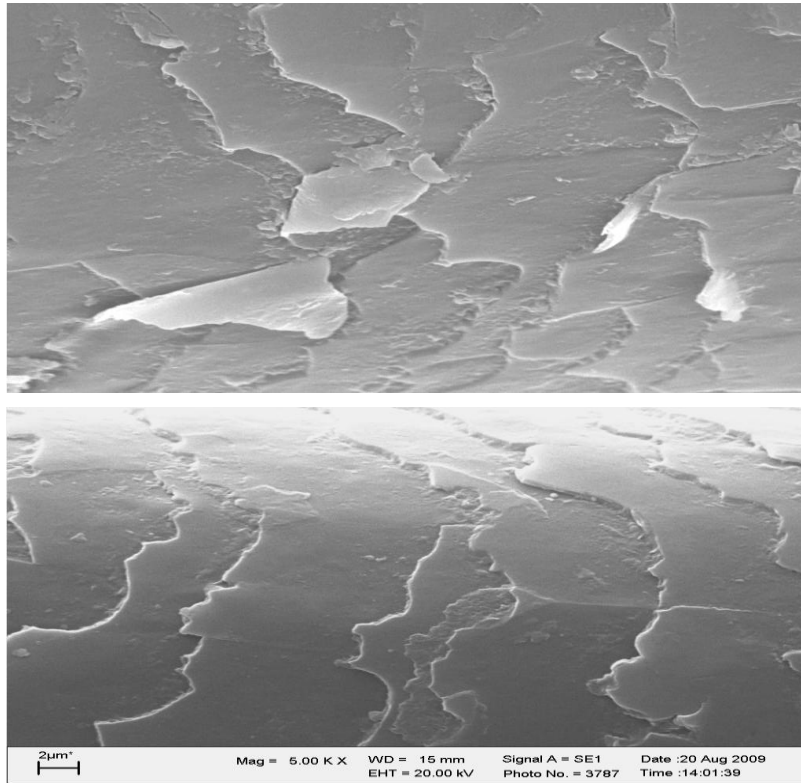
Blue Retinol

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

# Challenges

Microscopy (TEM, confocal, fluorescent, atomic force)

Hair surface analysis, mag. 5000 x



Before use of  
conditioner

After one use of  
conditioner



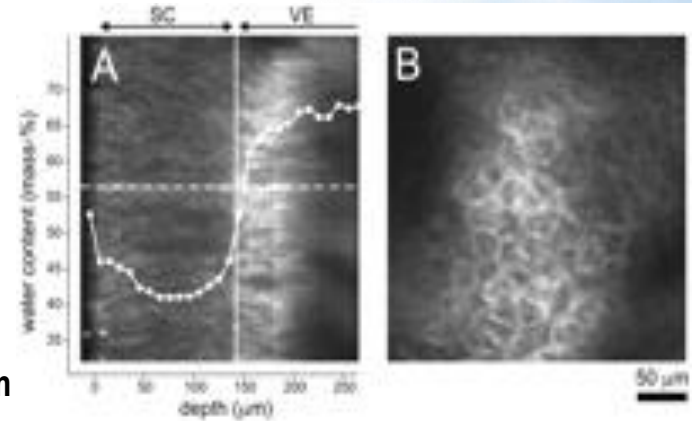
# Challenges

## 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.

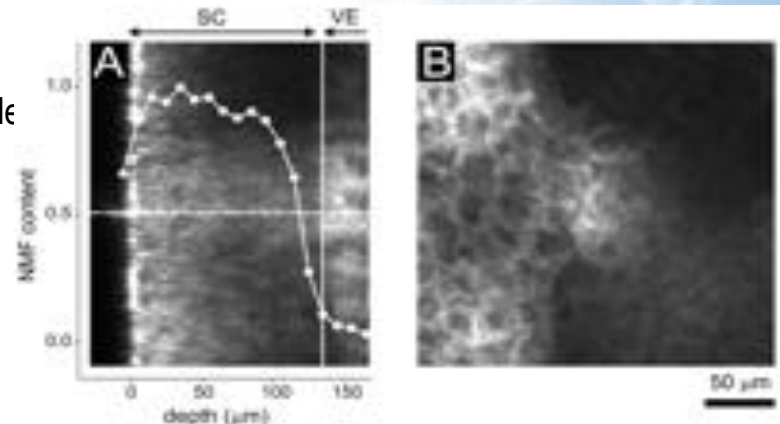
(B) Confocal image parallel to the skin surface (xy-plane), recorded at **145  $\mu\text{m}$  below the skin surface** at the boundary between SC and VE.



### 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  $\mu\text{m}$  below the skin surface** at the boundary between SC and VE.



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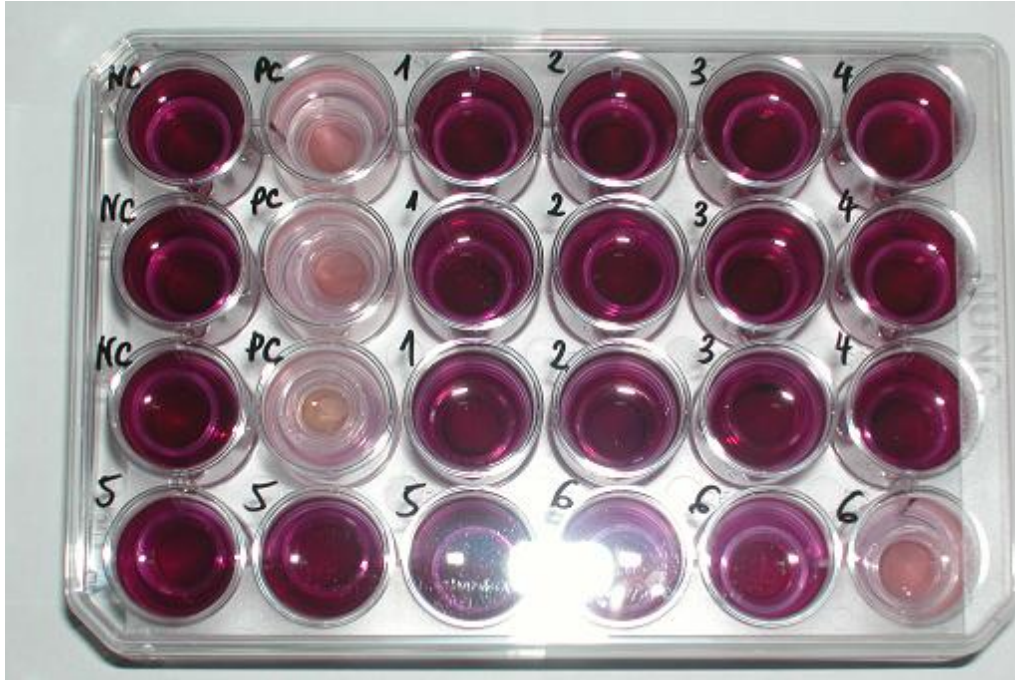


# Challenges

Alternative methods for safety assessment



Safety assesment on EpiDerm model

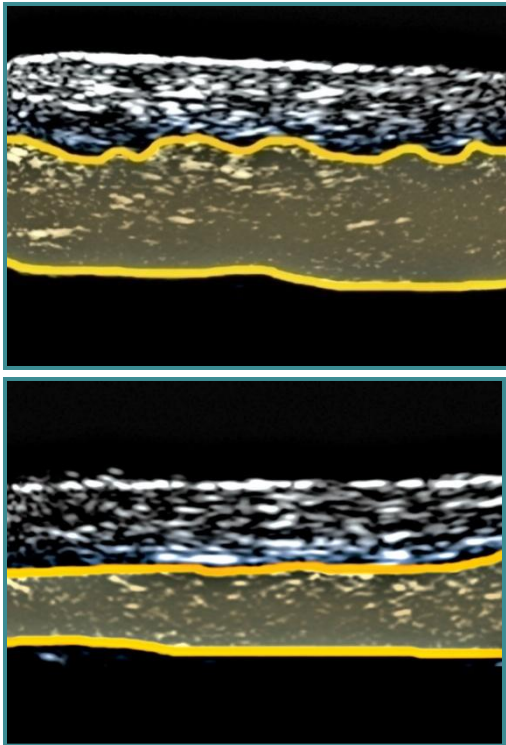


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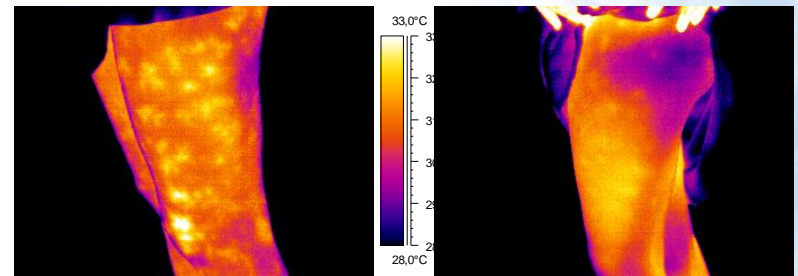
# Challenges

## Clinical trials

USG evaluation of product effectiveness



Corrective make-up



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



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# Needs of cosmetic industry

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

What is crucial:

- Knowledge
- Laboratory Equipment



*Thank you*