

# IN VITRO & EX VIVO TESTING



stratiCell  
Testing & Beyond

## Skin Ageing

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### Combined *in vitro* testing for full objectivation

**Skin ageing** is a complex and multi-factorial process that leads to deep changes in the skin structure and function. Beside the intrinsic and inevitable chronic ageing, the extrinsic ageing of skin is caused by external aggressions such as excess of solar radiation and pollution. Multiple dermo-cosmetic actives ingredients have proven their efficacy to prevent or reduce the resulting wrinkles, loss of elasticity, inflammatory or oxidative states.

**StratiCELL** offers an extensive range of *in vitro* assays to explore the anti-ageing properties of dermo-cosmetic active ingredients and skin care products. Both functional efficacy testing and gene expression analysis are available to offer full objectivation.



## Testing Methods

CELL SYSTEMS*	CHALLENGES	TESTING METHODS
<b>INFLAMMATORY RESPONSE</b>		
NHEK	Phorbol diester	• Quantification of cytokines release : IL-1-alpha, IL-6, IL-8, TNF-alpha
NHEK	TNF-alpha	• Quantification of cytokines release : CXCL5, MCP1
NHEK	UV-AB	• Quantification of cytokines release : IL-6, IL-8, TNF-alpha
NHDF	UV-AB	• Quantification of cytokines release : PGE-2
NHDF	Phorbol diester	• Activation of the NFkB transcription factor
RHE	Urban Dust	• Quantification of cytokines release : IL-1-alpha, IL-8
<b>OXYDATIVE STRESS</b>		
NHEK, NHDF, RHE	UV-A +/- UrbanDust	• Quantification of Reactive Oxygen Species (ROS) production
NHDF	None	• Heme Oxygenase 1 : gene expression and protein quantification
NHDF	InfraRed	• Quantification of Reactive Oxygen Species (ROS) production
<b>EXTRACELLULAR MATRIX REMODELLING</b>		
NHDF	None	• Detection and quantification of extracellular matrix components by immunostaining and/or ELISA: Collagens, Hyaluronic Acid, MMP-1, Elastin • Quantification of the enzymatic activity of MMP-1 by ELISA
NHDF	UV-A	• Quantification of extracellular matrix components by ELISA: MMP-1 and pro-Collagen-I
<b>HYPERPIGMENTED AGE SPOTS</b>		
RHE-SL(-SPOTS)		• Quantification of total melanin content after total melanin extraction, or based on <i>Fontana-Masson</i> histological images • High resolution dermoscopy images and pigmentation parameters (L*a*b coordinates)
<b>AUTOPHAGIC FLUX</b>		
NHEK, NHDF	None	• Quantification of LC3B turnover (in the presence/absence of a lysosomal inhibitor) by immunostaining
<b>GLYCATION</b>		
NHDF	Glyoxal	• Quantification of Advanced Glycated End products (AGEs) by ELISA • Detection and quantification of Carboxy-Methyl-Lysine (CMLs) or Receptors of AGEs (RAGE) by immunostaining
<b>CELL PROLIFERATION</b>		
NHEK or NHDF	None	• Bromo-deoxy-Uridine incorporation assay



## Gene expression analysis

CELL SYSTEMS*	CHALLENGES	TESTING METHODS
NHDF	None	• RT-qPCR : TaqMan Low Density Array (TLDA) to study the expression of 93 genes involved in the dermal biology, ECM remodelling and ageing process (see TLDA referred as “dermal benefits”)

\* NHEK : Normal Human Epidermal Keratinocytes - NHDF : Normal Human Dermal Fibroblasts – RHE : Reconstructed Human Epidermis  
RHE-SL-SPOTS : Melanized RHE Solar Lentigo with isolated pigmented spots