



Epithelial In Vitro Testing



Standard Tests

Tailored Tests

Custom Tests



In Vitro Tests With a Difference

There is a key difference to the in vitro testing services CELLnTEC provides: the cell culture media.

Why are cell culture media so important?

Because when testing active ingredients in vitro, we must consider that the potent compounds in culture media can be more powerful than your active, and may reduce the cell's responsiveness to all but the strongest external stimuli.

Only fully defined media can be finely tuned to deliver three key features for in vitro testing success:

1. **Accurately select** a pure population of the desired cell type
2. **Carefully induce** the desired cell behaviour (e.g. proliferation, differentiation, quiescence etc.)
3. **Remove compounds** from the culture medium that may affect cellular response or readout.

Using the latest insights into progenitor cell self-renewal and differentiation, we finely-tune the 80 ingredients found in CELLnTEC's fully defined epithelial culture media.

This allows us to select and enrich specific cell populations (such as progenitor cells), and to change cell behaviours like proliferation, differentiation, barrier formation, pigmentation and aging.

This rich experience now helps us to increase the accuracy and sensitivity of our in vitro testing services by refining the media for specific tests.



Fine tuning the 80 compounds in defined media is key for successful in vitro tests.

3 Routes to Powerful Cosmeceutical Claims

With a suite of 3 distinct approaches to cosmeceutical claims support, CELLnTEC's testing services cover the full spectrum from standard methods through to cutting-edge custom approaches developed using the latest biological insights and culture methods.



Standard Tests Established methods and experimental designs deliver efficient and cost effective support for well known claims.



Tailored Tests Fine tune standard tests to your exact needs. Switch to 3D culture, or quantify a novel protein. Dozens of possibilities at your **disposal**.

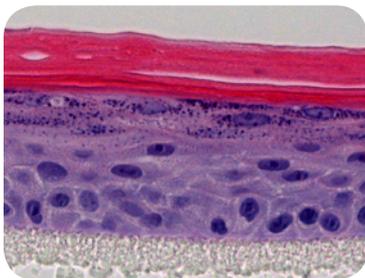


Custom Tests When powerful new claims based on cutting edge science are required, routine methods just can't deliver. Only custom will do.

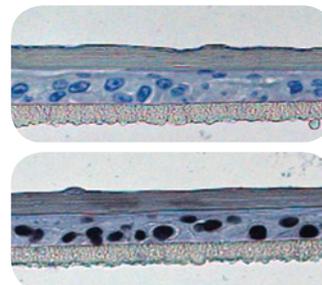
Five Families of Standard Tests

1. Aging: Epidermal and Dermal

Claim Type	Mechanism	End-Points
Extrinsic Aging - Acute	Acute UV exposure	DNA/Protein Damage Progenitor Cell Function Metabolism/ROS Inflammation
Intrinsic Aging - Acute	Oxidative Stress	DNA/Protein Damage Progenitor Cell Function Metabolism/ROS Inflammation
Intrinsic Aging - Chronic	VitroAge Medium - 3 weeks	Proliferation/Metabolism Proteomics
Rejuvenation		DNA/Protein Damage Progenitor Cell Function Metabolism/ROS



3D epidermal keratinocyte culture. H&E staining.



UV-induced DNA damage (thymine dimers).

Upper: control
Lower: UV exposed

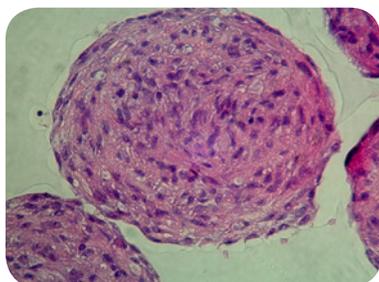
2. Epidermis

Claim Type	Mechanism	End-Points
Cytotox and Metabolism	Active Ingredient Treatment	Viability/Proliferation Metabolism/ROS Migration
Stem/Progenitor Cell Function	Active Ingredient Treatment	2D colony formation 3D tissue formation
Barrier/Differentiation	Active Ingredient Treatment	3D Barrier Function 3D Differentiation
Soothing + Detox	Active Ingredient Treatment	Inflammation Detox mechanisms

Five Families of Standard Tests

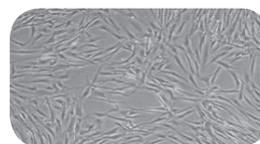
3. Dermis

Claim Type	Mechanism	End-Points
Cytotox and Metabolism	Active Ingredient Treatment	Viability/Proliferation Metabolism/Antioxidant Migration
Firming + Matrix	Active Ingredient Treatment	ECM Synthesis ECM Degradation
Stem/Progenitor Cell Function	Active Ingredient Treatment	3D spheroid formation Papillary phenotype

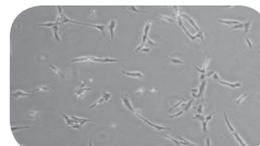


Dermal progenitor cells growing as spheres in suspension culture.
H&E staining.

H&E staining.



Fibroblast progenitors aged with oxidative stress.



Upper: control
Lower: exposed

4. Pigmentation: Melanocytes

Claim Type	Mechanism	End-Points
Melanin Content	Active Ingredient Treatment	Total melanin content Tyrosinase activity

5. Lipids: Adipocytes

Claim Type	Mechanism	End-Points
Fat metabolism	Active Ingredient Treatment	Lipolysis Lipogenesis

More Information

For more detailed information about any of the five test families, please contact us via email:

services@cellntec.com

Tailored Tests

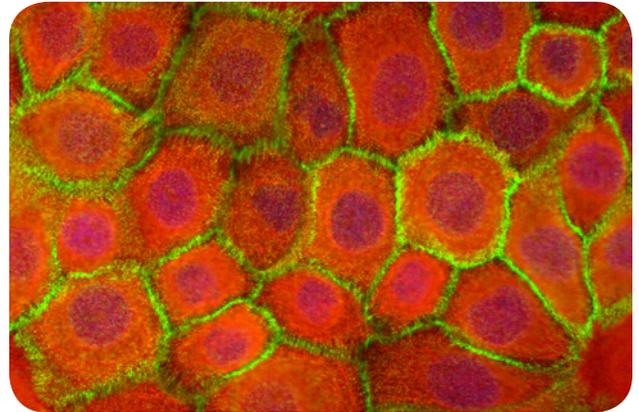
CELLnTEC's Toolbox At Your Disposal

Standardised tests can be modified in many ways to tailor them to your exact needs.

CELLnTEC broad toolbox of methods is the starting point when designing tailored tests.

The main variables to consider are:

- cell type
- culture type
- challenge-type
- analytical method
- end-point



Main components of CELLnTEC toolbox may be summarized as follows:

Cell Types	Culture Types	Treatments	End-Points
Keratinocytes (progenitor enriched)	2D proliferation	Active Ingredient	Protein expression
Keratinocytes (differentiated)	2D differentiation	UV	Enzyme activity
Fibroblasts (mixed pop.)	3D stratified	Sunlight equiv.	Barrier function
Fibroblasts (progenitor enriched)	3D spheroid	Chronic aging	Metabolites
Melanocytes (progenitors)	Co-culture	Oxidative stress	ROS
Melanocytes (differentiated)			
Preadipocytes & adipocytes			

Please let us know your needs, and we will gladly send you a proposal outlining the most effective way to address your question.

More Information

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Customized Tests

First Use of Novel Methods

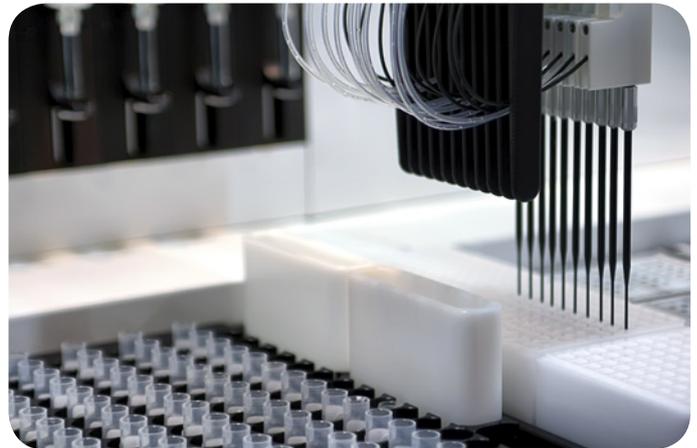
The continuous evolution of science and technology brings a steady flow of new biological insights and analytical possibilities.

Collectively this means that old questions can often be evaluated from totally new perspectives.

Leaders in the cosmetic industry regularly invest in the refinement of novel methods that are not yet widely used in order to be first-to-market with powerful new support for their claims.

Examples of biological fields and analytical methods that have advanced significantly in recent years include

- stem and progenitor cells from the epidermis and dermis
- in vitro models of chronic aging
- multiplex proteomic analyses that can quantify hundreds of proteins in a single run.



New fields that are now developing include 3D aging models, and the field of epigenetics.

CELLnTEC has a strong record of working with cutting edge cosmetic companies to develop powerful new ways of supporting important claims.

We would be happy to hear areas of interest for you, and to propose novel ways in which these areas could be addressed.

More Information

To further discuss development of custom tests, please make contact with us:

services@cellntec.com

Greater Sensitivity With Chronic In Vitro Aging

Keratinocytes grown in VitroAge medium (CnT-AG2) **age naturally** over several weeks, without the need for non-physiological chemical triggers or acute doses of strong oxidisers such as peroxide.

At the end of this period, the cells display a range of age-related changes, similar to the complex set of changes seen in vivo.

Using advanced MRM proteomics, it is now possible to evaluate 100 age-related proteins in parallel in a single sample.

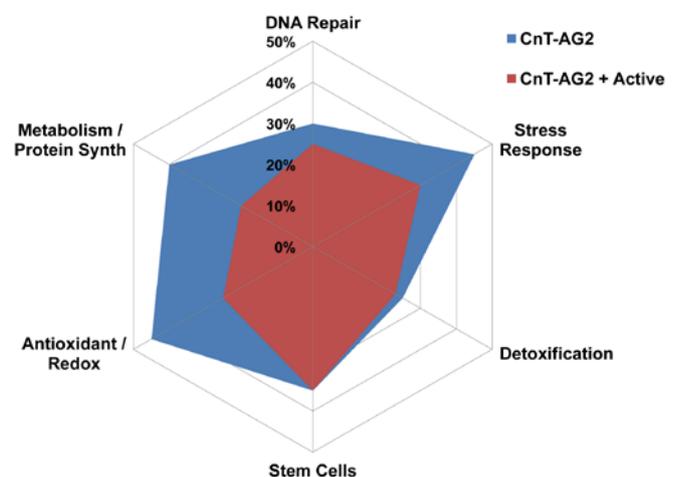
MRM Proteomics is thus ideally suited to evaluate a group of age-related changes in a single run, without the variability and functional uncertainty associated with traditional gene-expression analyses.

The **broad proteomic analysis** enables evaluation of a range of age-related processes:

- DNA repair mechanisms
- Detoxification mechanisms
- Cellular stress responses
- Stem / progenitor cell markers
- Antiox / redox mechanisms
- Metabolism / protein synthesis

The **detailed insights** can be evaluated at the single protein level, or as groups.

Grouped analysis of 6 age-related processes gives a clear overview of the areas in which an active ingredient has the strongest effect



More Information

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