

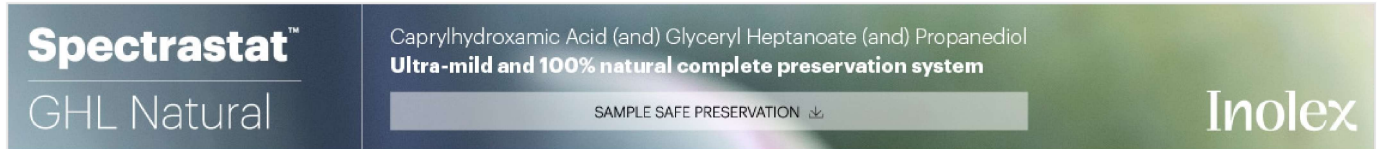
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Anne Charpentier (En/Anne-Charpentier-304/)

Anti-pollution claims (2/2): in-vitro and ex-vivo assays

Anne Charpentier (Photo: Girl with red hat via Unsplash)

24 January 2023

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The stress induced by the pollution can increase the formation of glycated products at the several layers of the skin. It produces the Advanced Glycation End Products (AGE). These AGE affects the quality of the extracellular matrix by destroying the collagen. The chronic stress induced by external pollutants alters the integrity of the skin barrier and generate various skin disorders: sensitivity, pigmentation, dermatitis, etc.

There are various methods which enable to evaluate anti-pollutant efficacy on cell supports, skin model or skin 3Dprint using many **biomarker analyses**: Cell Proliferation, Lipid metabolism, Carbonylated proteins, Antioxidant defences markers, DNA damage, various Proteins (barrier function, pigmentation or mitochondrial), Inflammation mediators, or Protease activity.

To address the needs for anti-pollution claims substantiation, the major CROs also developed **specific *in-vitro* and *ex-vivo* protocols** that objectively evaluate skin exposure to several pollutants. These assays represent **an ethical alternative to human testing** when induced stresses are harmful: pollution, UV... They can demonstrate the effects **in preventing pollutants from adhering to the skin surface, removing pollutants from the skin or in reducing their oxidative impact.**

Beyond the duration of use that everybody would like longer and longer, 3D skin models, epidermis, or full thickness – bioprint or not – and *ex vivo* testing present **undeniable benefits for the anti-pollution evaluation** through:

- ▶ The standardized assay conditions
 - ▶ The various end points and their combination of assays
 - ▶ The choice of various analytical methods : Proteic and metabolic methods; Morphology and imaging
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methods, Gene expression, multi-omics approach, ...





Quantitative and illustrative results.

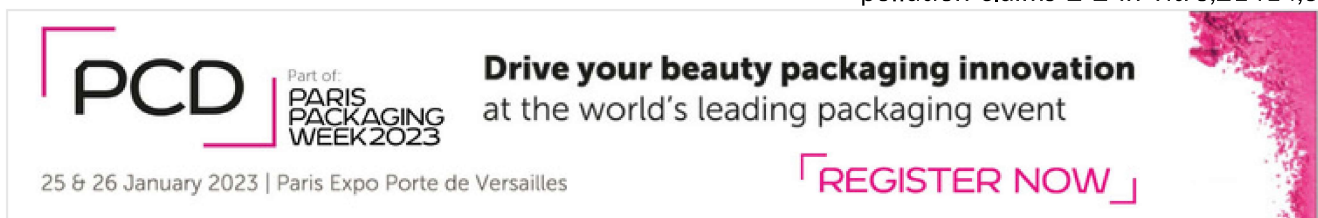
Several types of pollution stress can be applied, either directly in the cell culture media or by spraying the pollutant on the assay support or in a chamber: Blue-light (400 – 470 nm), UVA, UVB, Infrared, cigarette smoke, ozone, heavy metals, volatile organic compounds, PM 2.5, particulate matters, inflammation mediators.

The main biomarkers that are quantified are numerous: Cell Proliferation, lipid metabolism, Carbonylated proteins, antioxidant defence markers, DNA damage, various proteins (barrier function, pigmentation or mitochondrial), inflammation mediators, or protease activity. The choice of the test models depends mainly on the studied mechanism of action.

A few questions remain, how can the anti-pollution testing evolve?

For efficacy objectivation, *in-vitro* and *ex-vivo* methods often represent **quicker, cheaper and a reliable proof of concept** as predictors of efficacy in humans. The combination of the 3 pillars of the assay design among the **selection of the biomarkers, the analytical methods and the assay supports** making the in-vitro testing a source of constant innovation for the beauty industry. The preliminary discussions with each *in vitro* CRO's to design the protocol to answer the aim of the study is crucial to select the best analyses adapted to the searched biomarkers.

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Anne Charpentier (En/Anne-Charpentier-304/)



(en/anne-charpentier-304/)

Skinobs

Anne Charpentier is the founder and CEO of Skinobs.com (<https://www.skinobs.com>) the very **first web platform dedicated to *in vivo* efficacy cosmetics testing**.

Skinobs (<https://www.skinobs.com>) allows cosmeticians worldwide to identify for free the *in vivo* efficacy methods and the testing laboratories suitable for any product claim. It is a comprehensive and independent tool which optimizes the development of products in terms of performance, cost, speed, and innovation. It provides a 360-degree vision of *in vivo* efficacy testing.

In 2020, Skinobs.com (<https://www.skinobs.com>) strengthened their offer with the launch of a new platform dedicated to **preclinical testing**.

The new "Preclinical Testing" platform enables users to identify and select the most relevant testing methods depending on several criteria:

- ▶ Test category: Analytical tests, Content-contenair interaction, Ecotoxicity and Biodegradability tests, Safety tests, UV tests, efficacy tests...
- ▶ Claim: anti-ageing, anti-pollution...
- ▶ Test support: cell cultures, 3D skin models... the various tests corresponding to his objectivation project and directly contact each test provider. A keyword search also simplifies the search.

To get access to the platform: www.skinobs.com (<https://www.skinobs.com>)

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om) Still in the wave of a successful comeback event in early 2022, Luxe Pack Los Angeles, the trade show for creative...

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Anti-pollution claims (2/2): in-vitro and ex-vivo assays (en/anti-pollution-claims-2-2-in-vitro,21414,en)

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A photograph of laboratory glassware on a yellow surface. In the foreground, a large glass beaker is partially filled with a clear liquid. Two test tubes are placed inside the beaker, leaning against each other. The test tube on the left contains a bright orange liquid, while the one on the right contains a light blue liquid. The background is a plain, light blue surface.

(en/anti-pollution-claims-2-2-in-vitro,21414,en)

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Make-up sponges: how to get out of 100% petrochemicals? (en/make-up-sponges-how-to-get-out-of,21366)

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The development of more responsible beauty sponges, expected by customers, is a major challenge for the cosmetic accessories industry,...


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South Korea make-up market to renew with growth, finds GlobalData (en/south-korea-make-up-market-to,21426)

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France tightens rules on “net zero” claims to take aim at greenwashing (en/france-tightens-rules-on-net-zero,21344)

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