

Potentialisation des effets néfastes d'une exposition de kératinocytes et explants de peaux en culture à un cocktail de COVs par les rayonnements UV

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The skin: a target for environmental pollutants



Skin Dullness



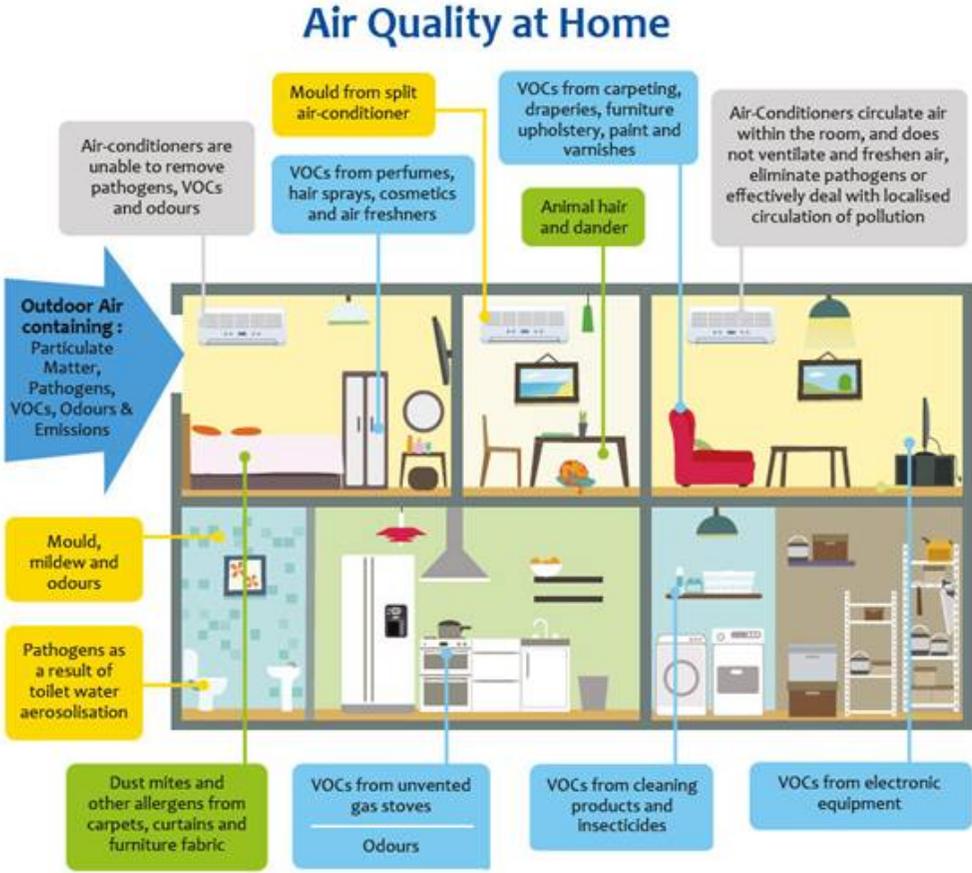
Skin Oxidation



Skin Dryness

Drakaki, E., et al (2014).
Air pollution and the skin.
Air Pollution, 2.

Volatil Organic Compounds (VOCs) in our environment



Contre-plaqué,
panneaux mélaminés



Fumée de
cigarette



Textiles
d'ameublement



Résines
et colles



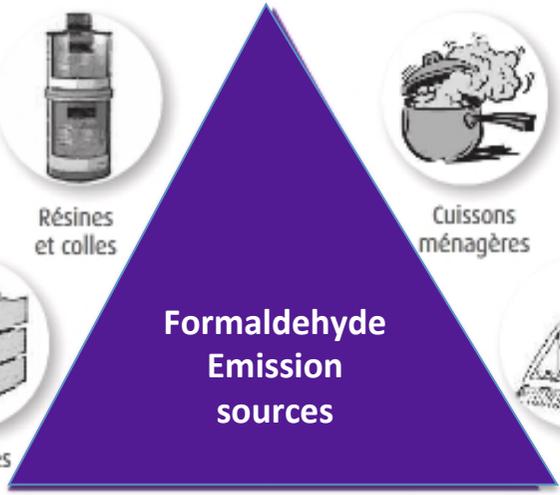
Cuissons
ménagères



Meubles

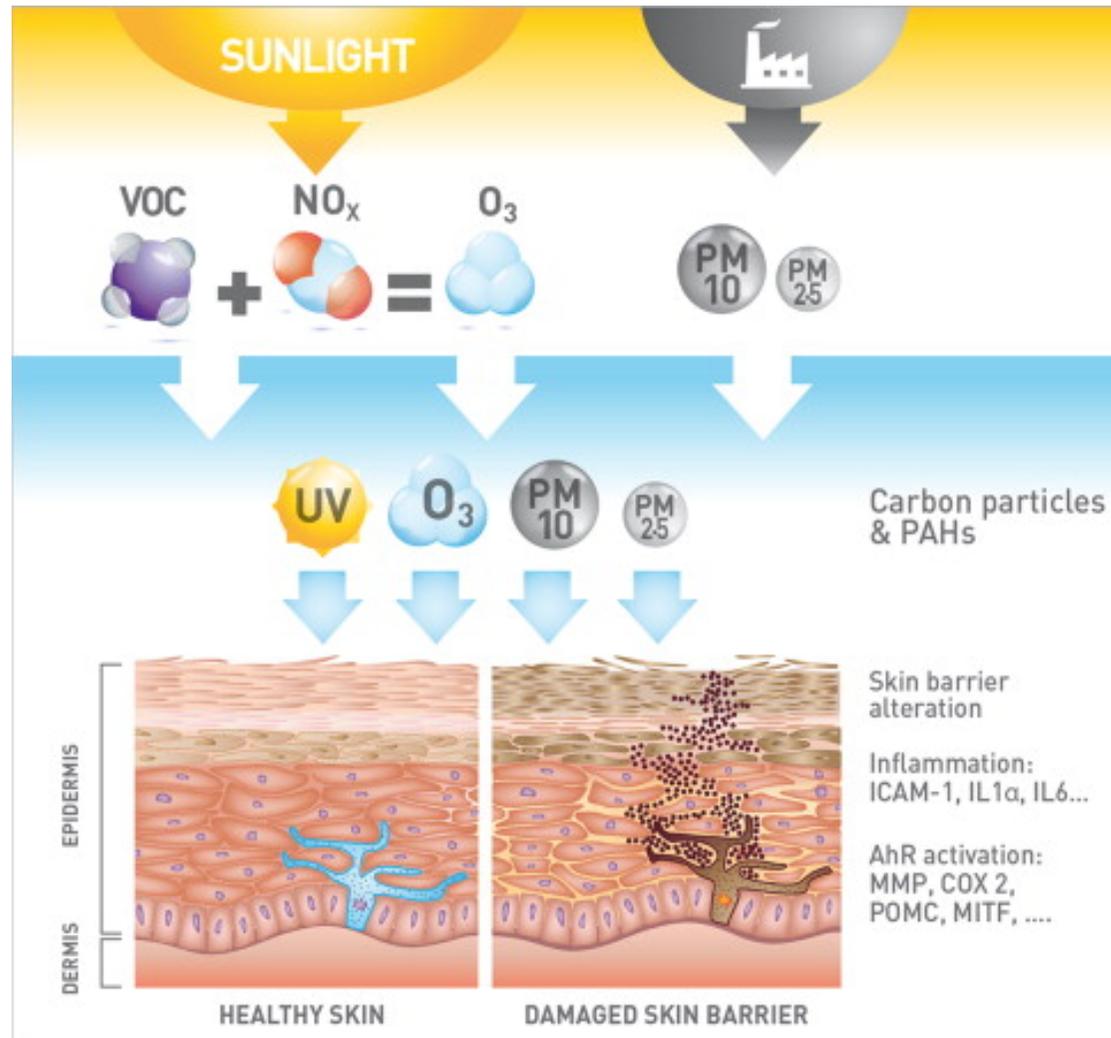


Tapis

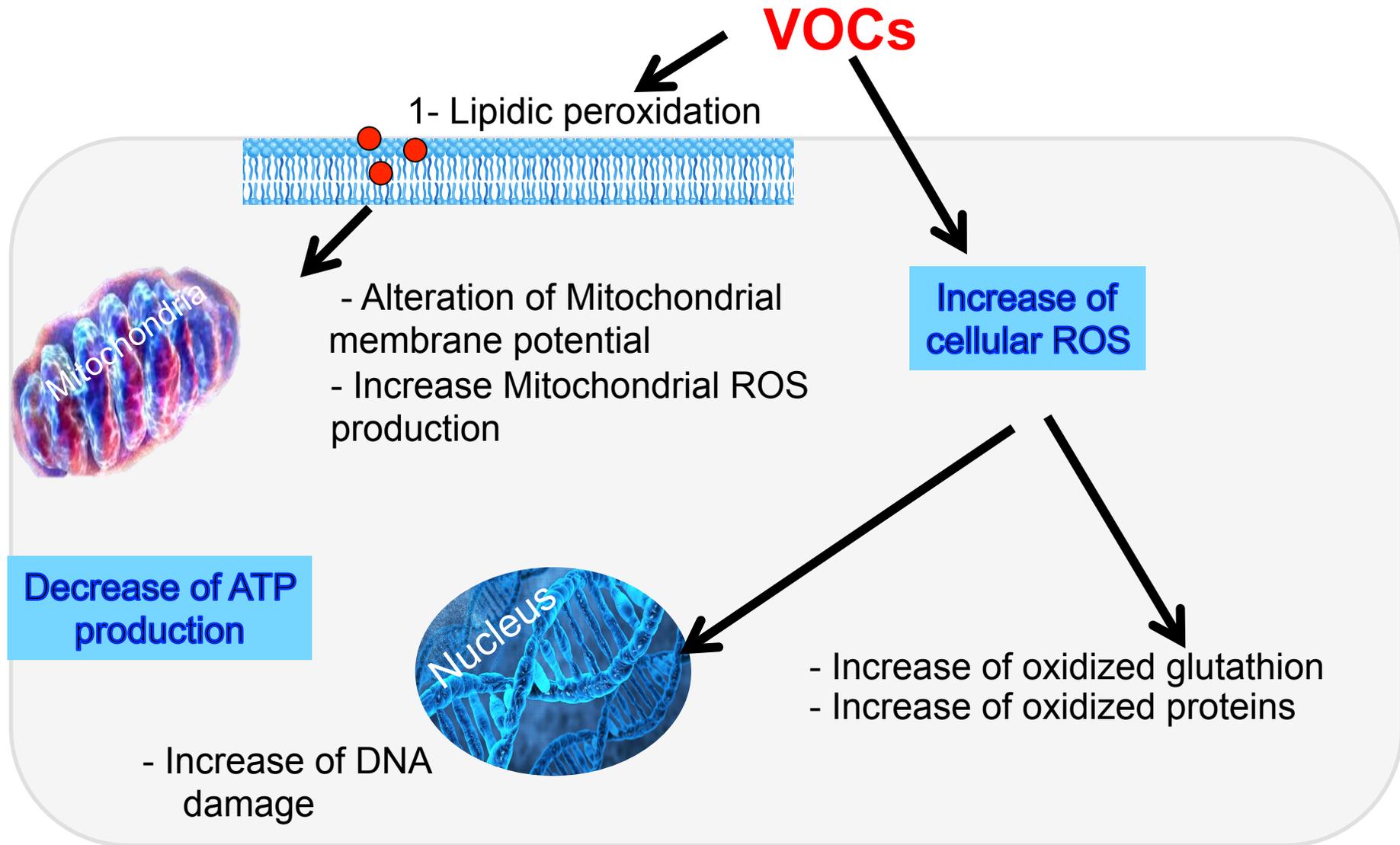


Formaldehyde
Emission
sources

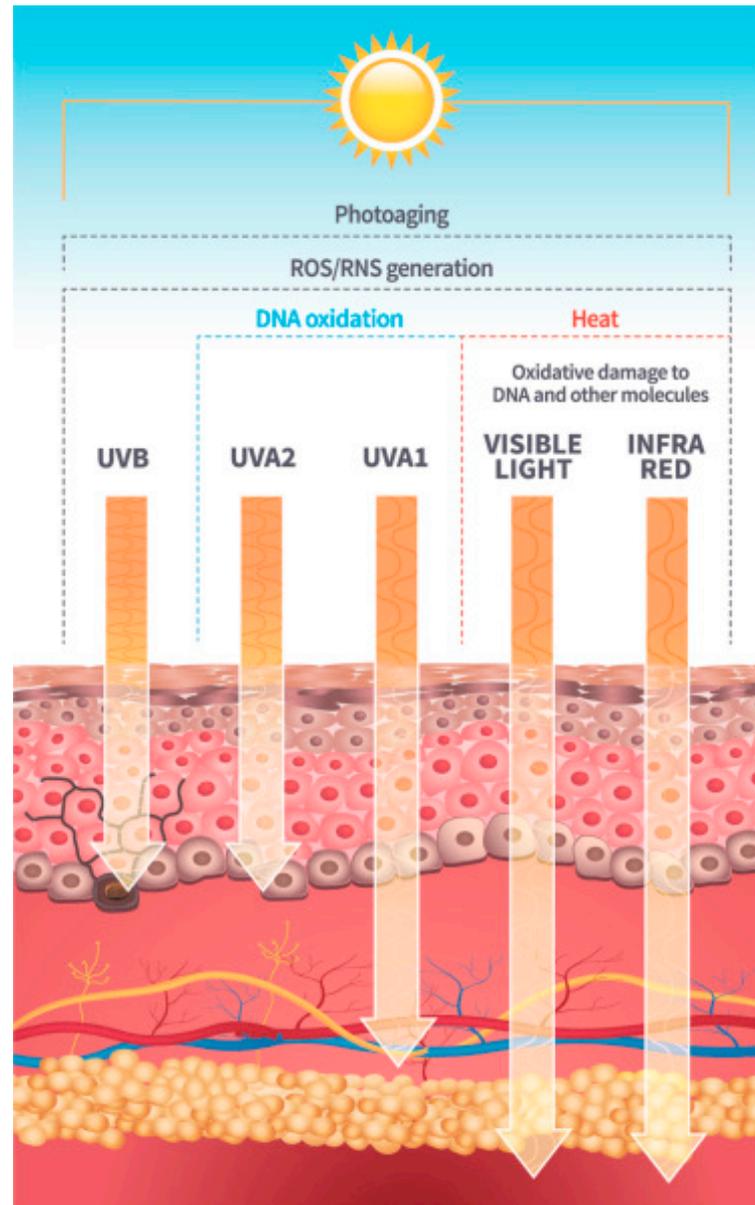
Model of pollution induced-skin damage



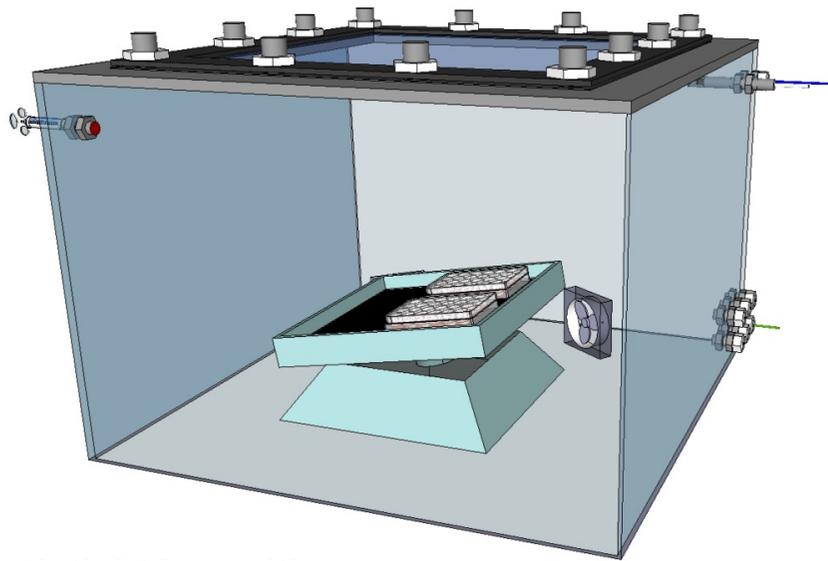
Impact of VOCs on keratinocytes



Model of pollution induced-skin damage

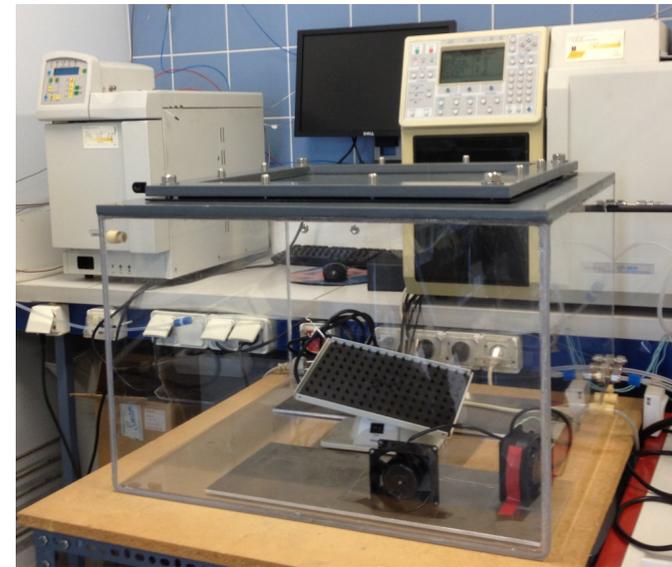


Cell exposure device and exposure conditions



144L tight box with

- mixing fans
- Humidity and temperature sensor
- Automatical sampling with Flame Ionization Detector (FID)-Gas Chromatography
- analysis

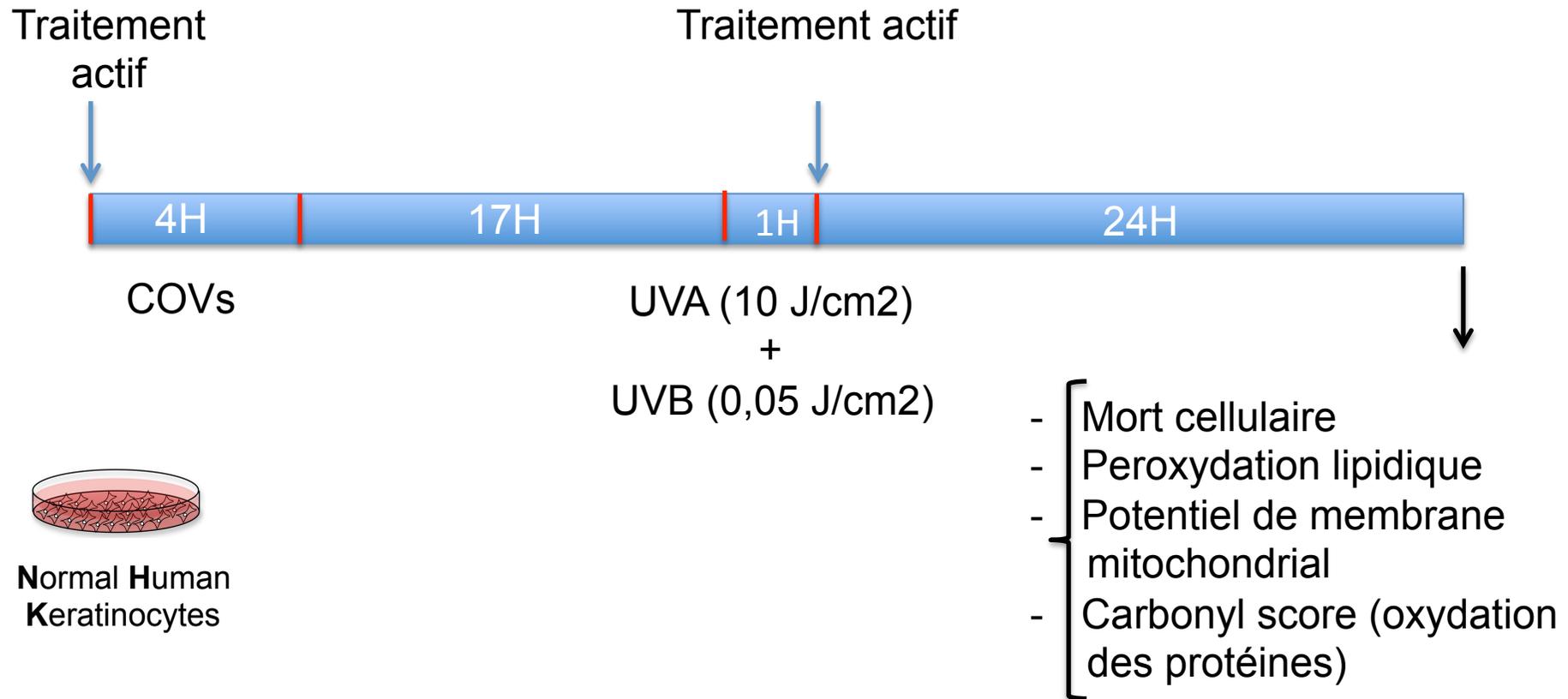


Exposure of epidermal cells to VOC mixture

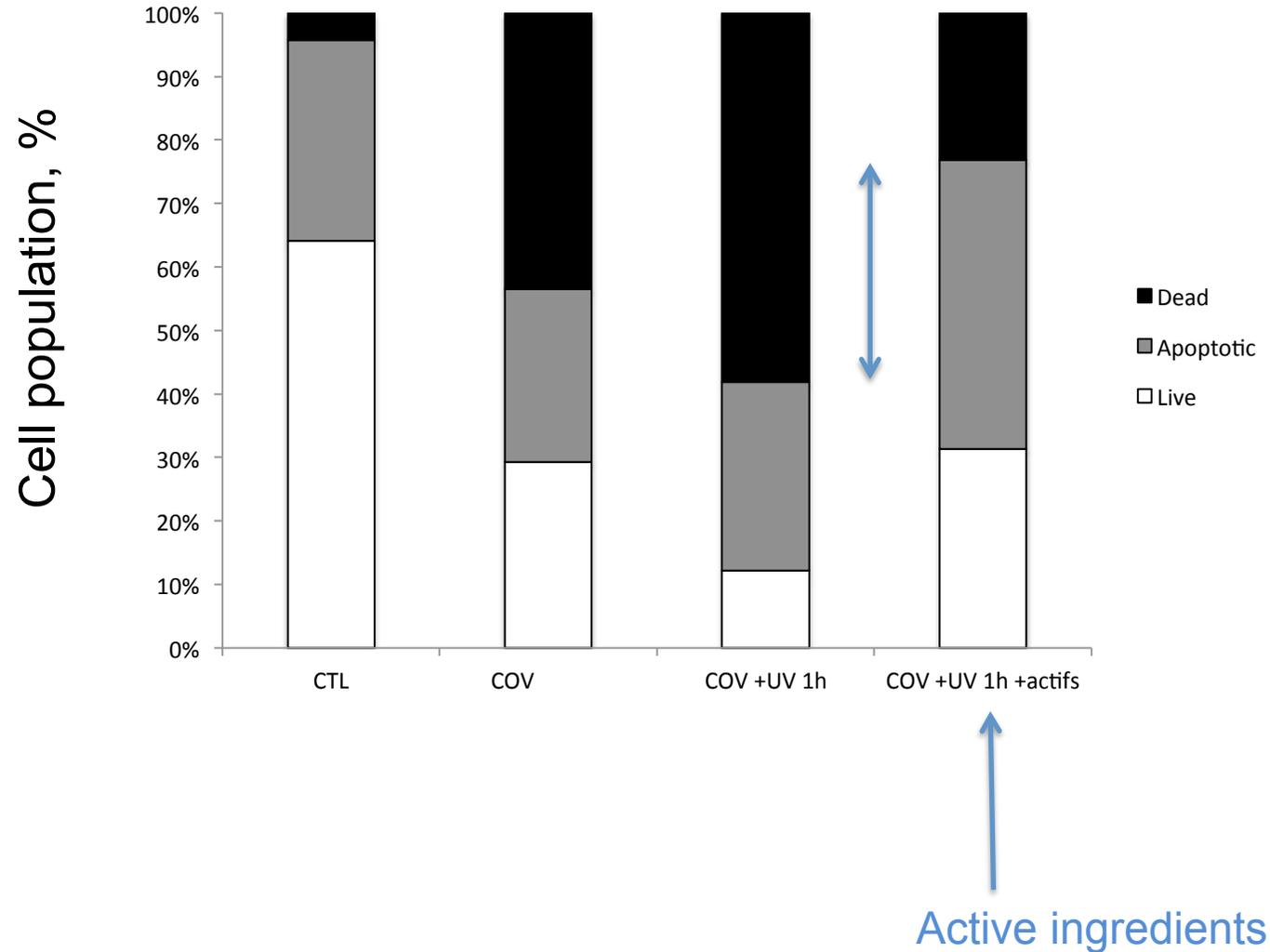
20 ppm :

4 ppm toluene + 4 ppm hexane + 4 ppm acetaldehyde + 4 ppm acetone + 4 ppm formaldehyde

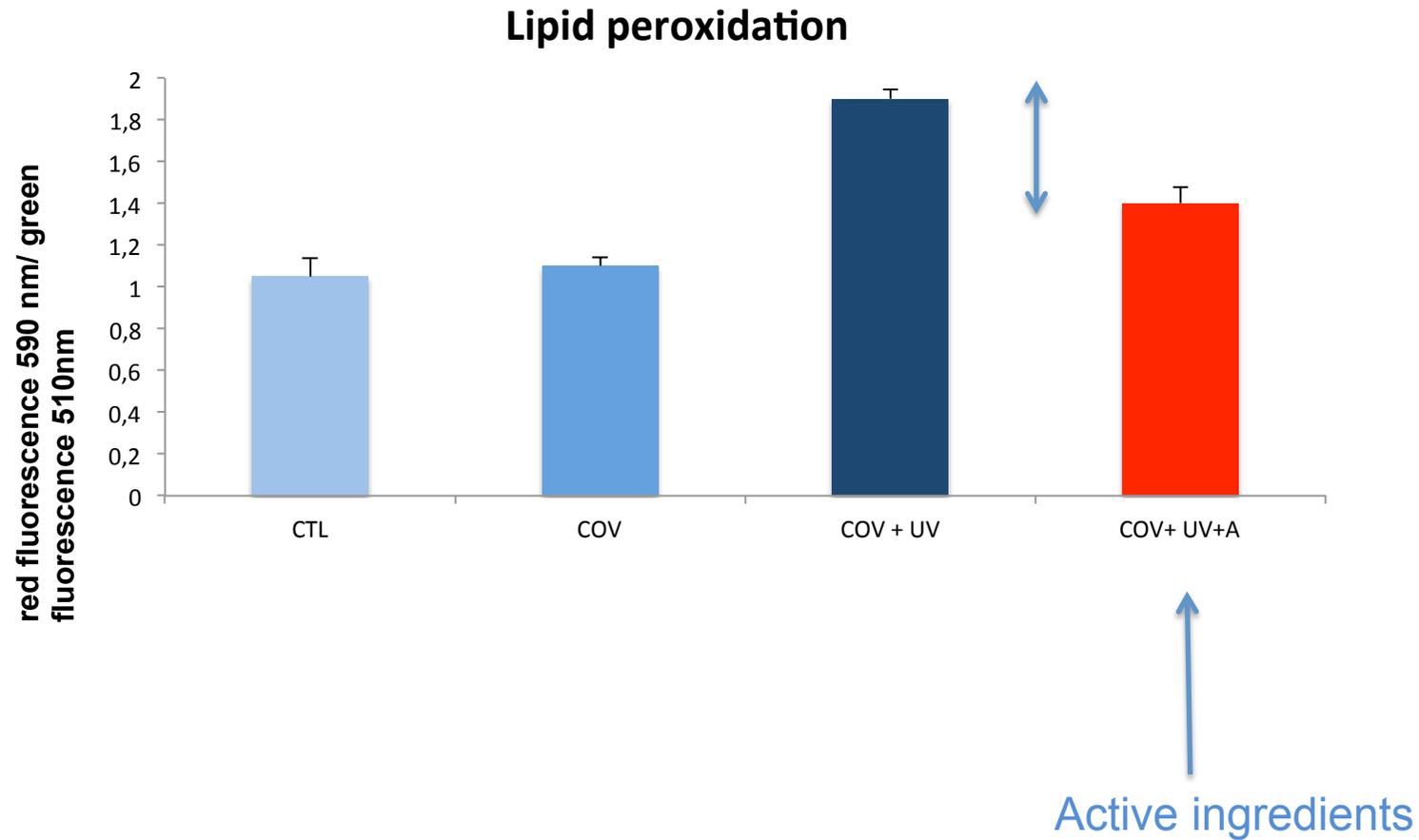
Cell exposure device and exposure conditions



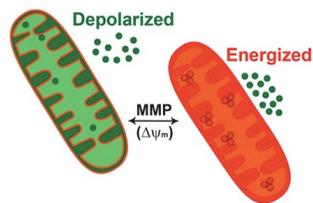
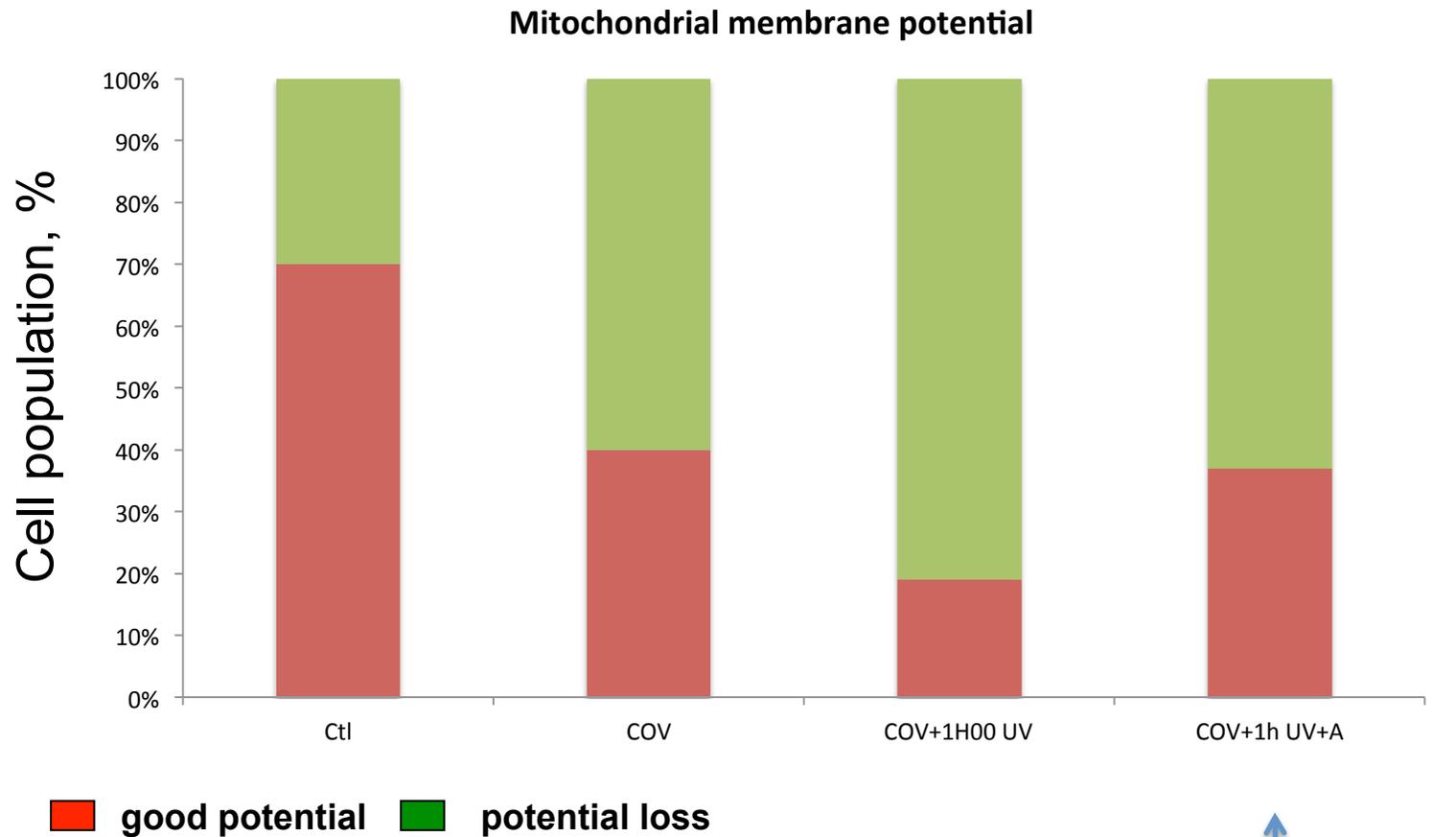
Potentialiation by UVs of COVs toxicity on human keratinocytes



Lipid peroxidation induced by combined exposure (COVs + Uvs)



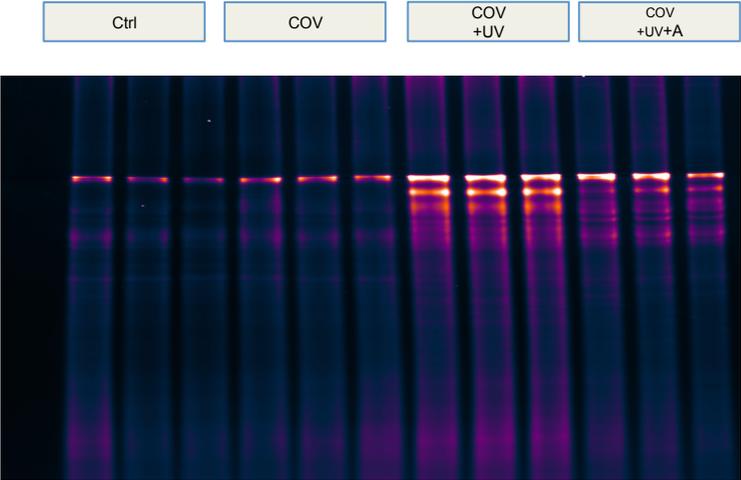
Effects of combined exposure on mitochondrial potential



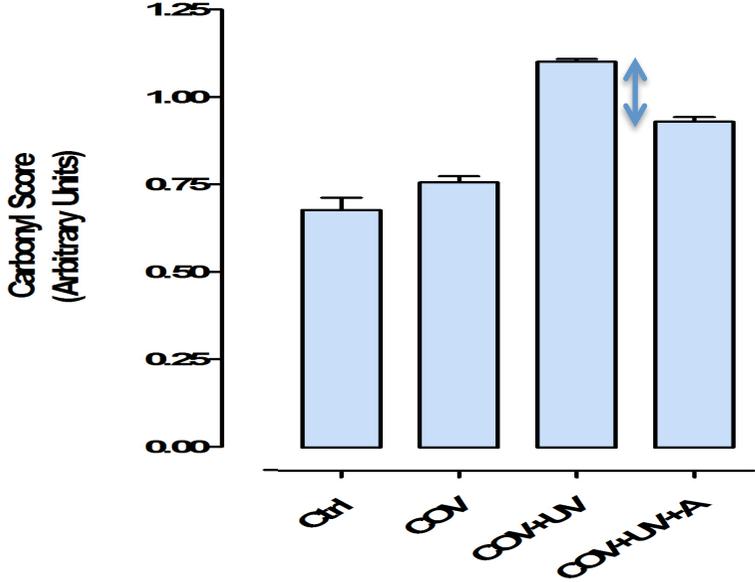
Active ingredients

Increased protein oxidation after combined exposure

Carbonyl Score

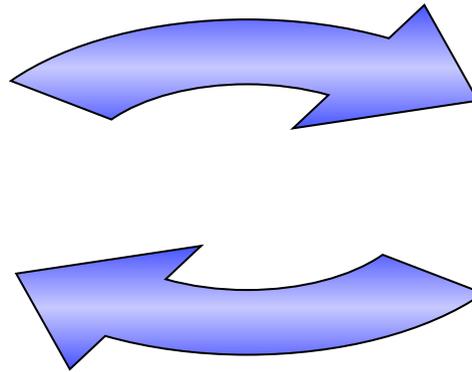
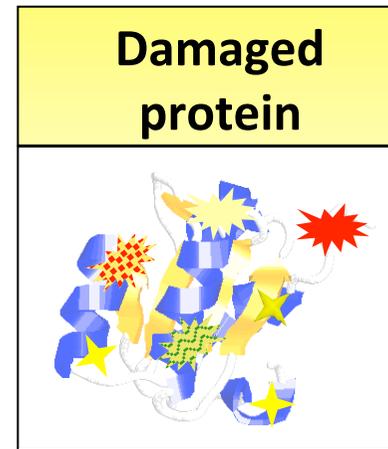
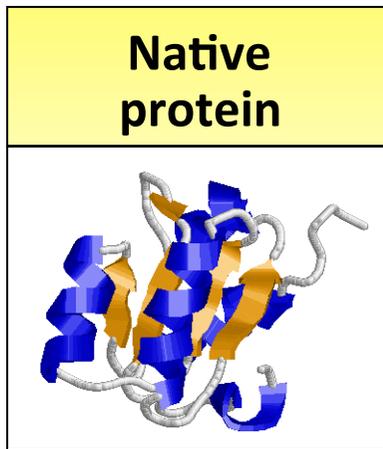


Active ingredients



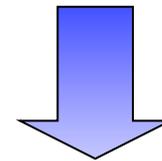
Protein maintenance

Oxidative stress
(UV, ageing,
pollution)

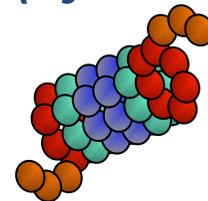


Repair systems:
PMSR

PMSR
Peptide Methionine
Sulfoxide Reductase

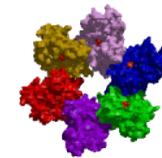


proteasome
(*cytosol*)



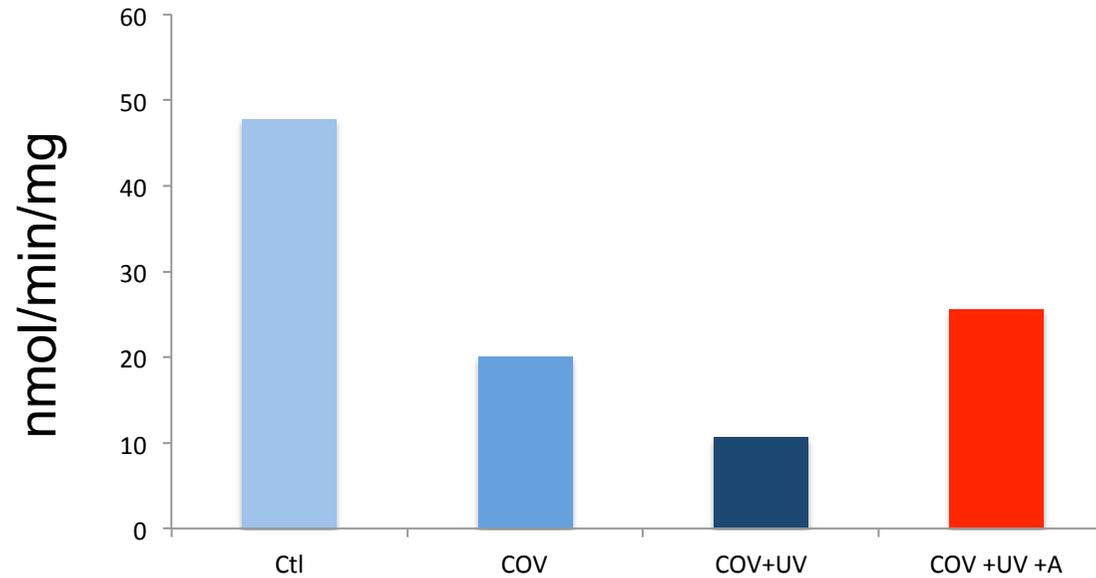
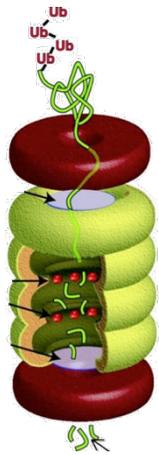
Proteolysis

Lon protease
mitochondria



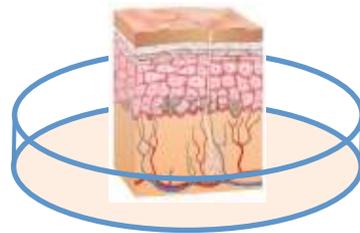
Defects of protein maintenance following combined exposure

Proteasome activity

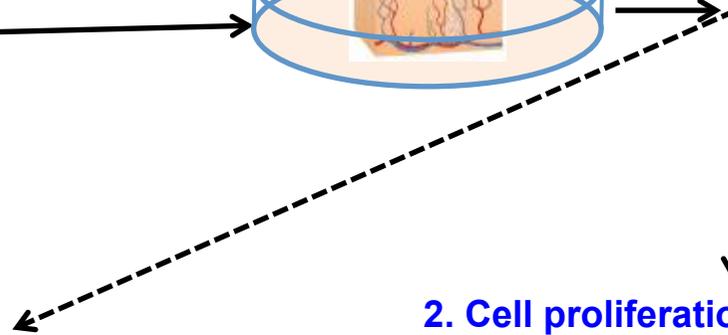
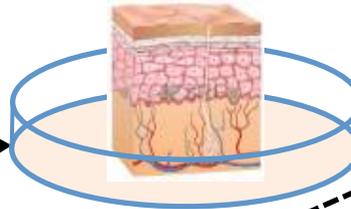


Ex-vivo protocol for COVs and/or UV treatments

**4 days COVs exposure
(4 hours and 1 hour UV)**

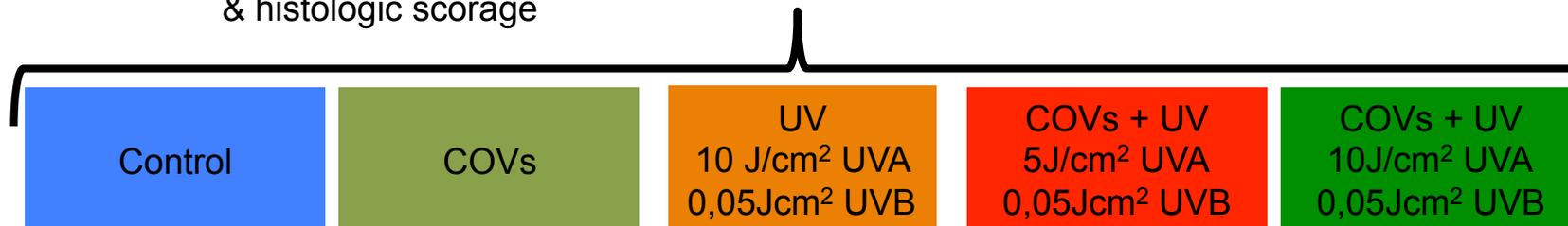


Skin explant

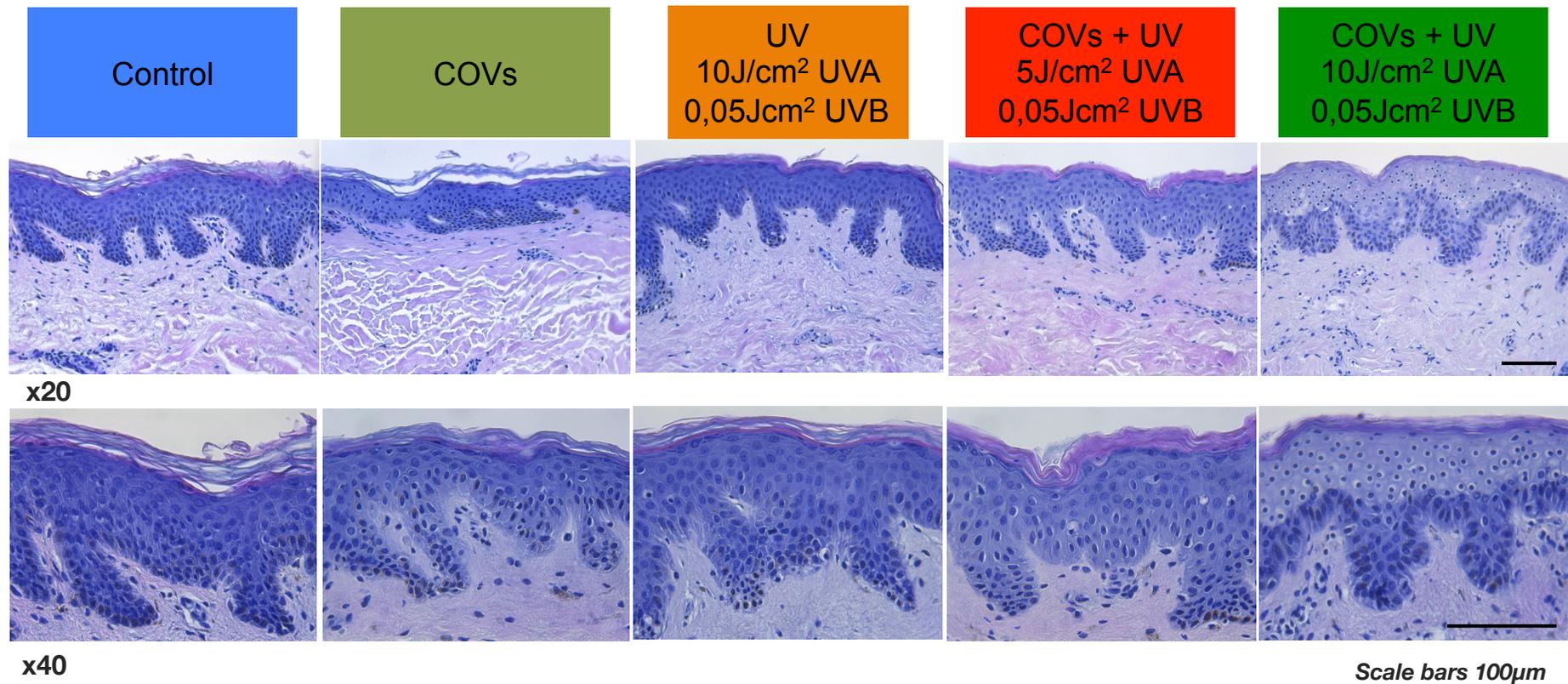


1. Histology:
Cutaneous morphology studies
& histologic scorage

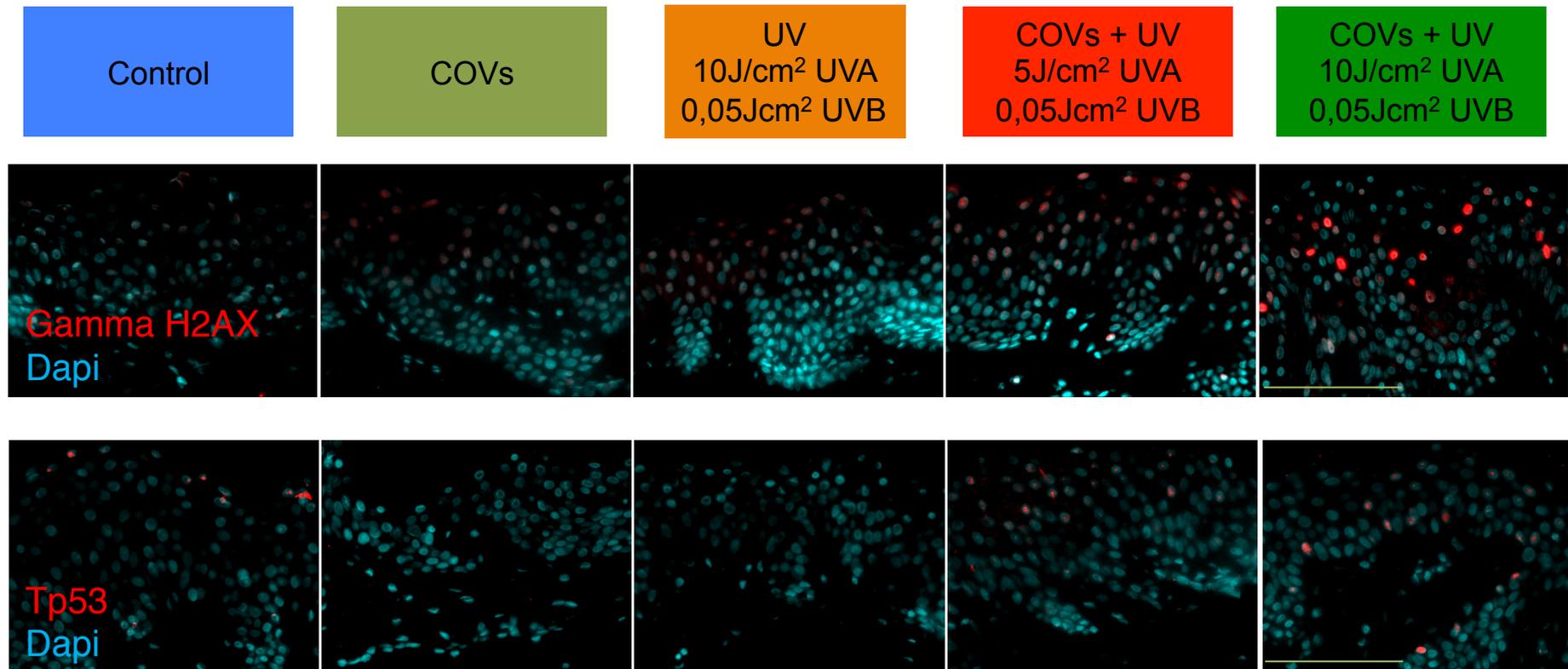
2. Cell proliferation, proteasome activity



Effects of combined exposure on skin morphology

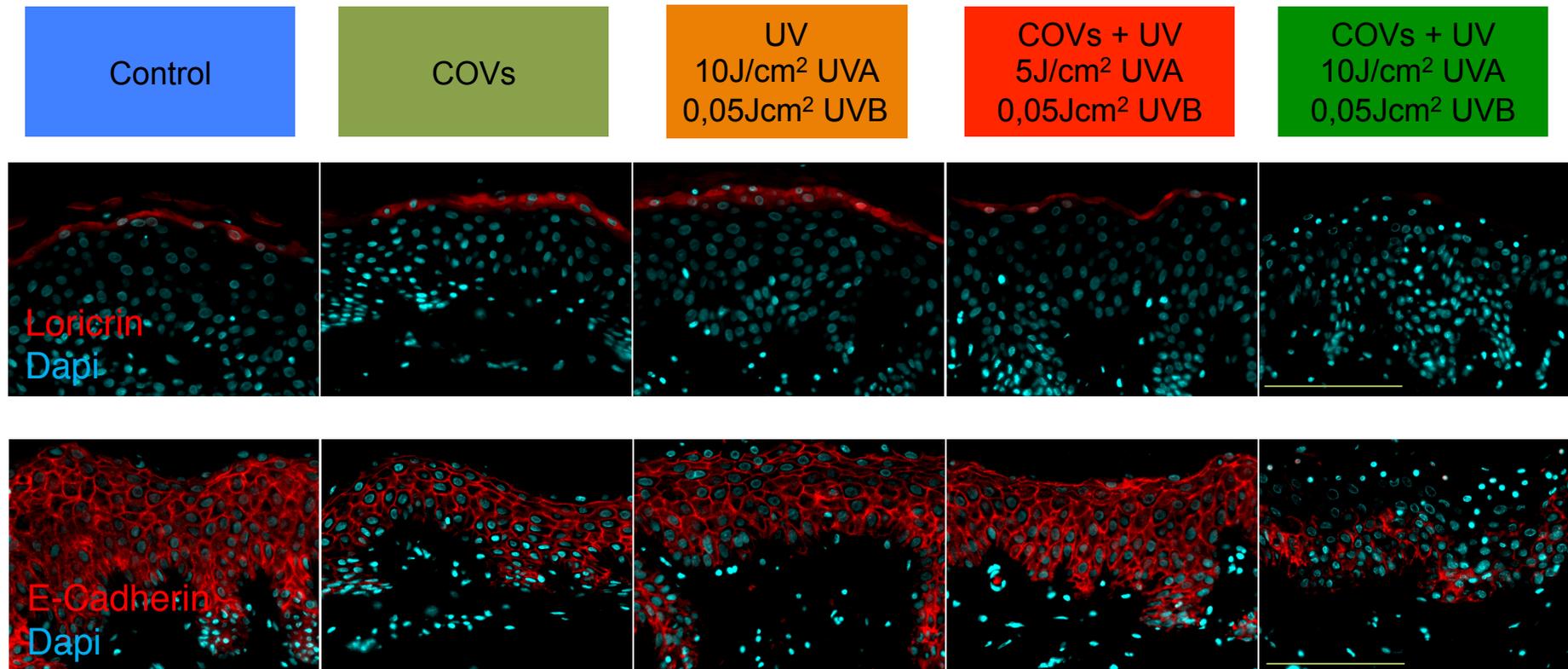


Effects of combined exposure on skin DNA Damage



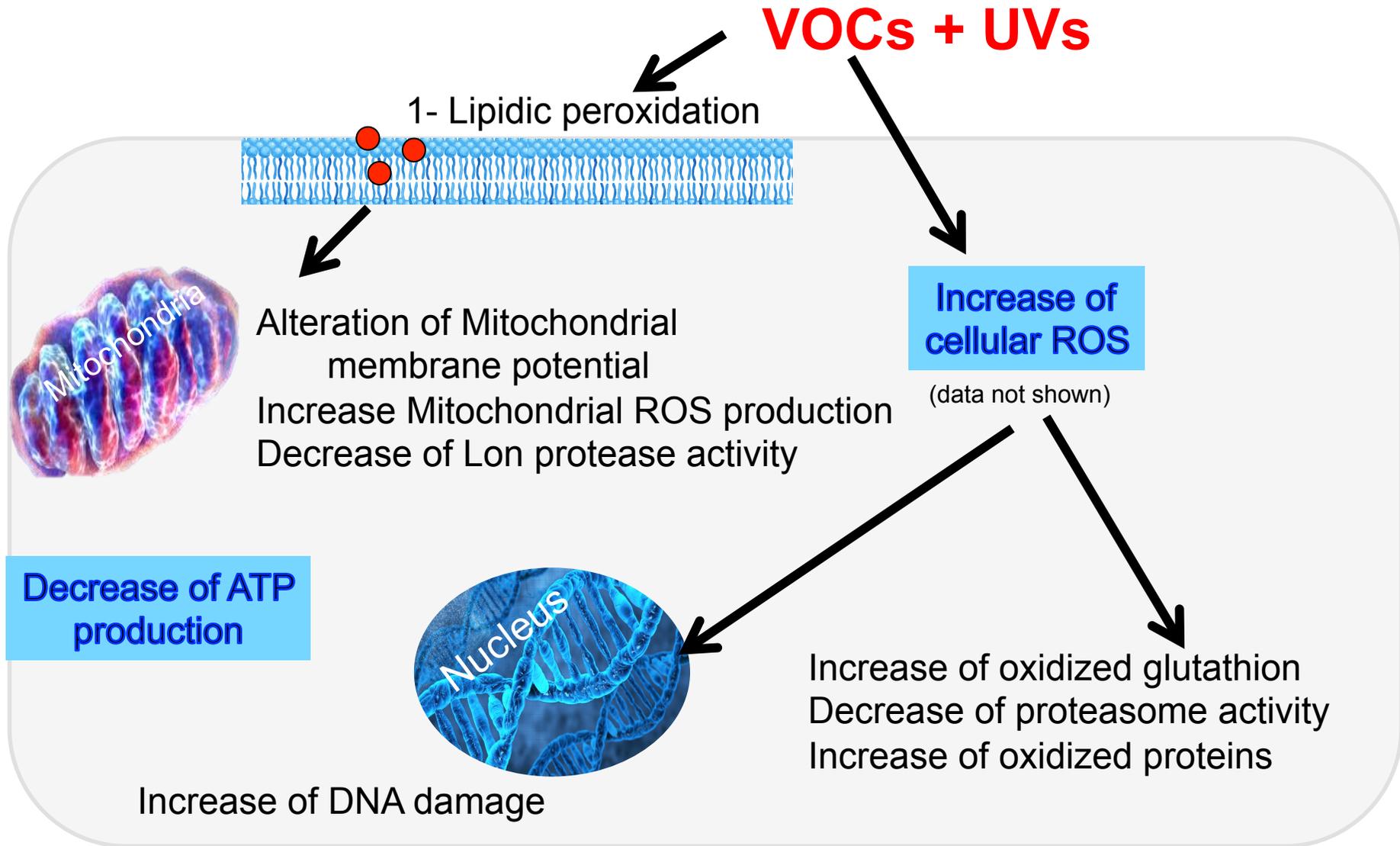
Scale bar: 100 μ m

Effects of combined exposure on skin barrier



Scale bar: 100 μ m

Conclusions



THANK YOU

LVMH RECHERCHE Collaborators

Carine Nizard

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IPREM collaborators:

- Sylvie Lacombe

- Mickael Le Behec

-Nathalie Costaramone

**Plateforme de protéomique
IPBS, Toulouse**

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