

An active perfume ingredient could stimulate the olfactory receptors of the human skin keratinocytes

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INTRODUCTION

Olfactory receptors (ORs), initially described in the olfactory epithelium, are also expressed in human skin cells such as keratinocytes. Beyond their role in smell, cutaneous ORs are increasingly recognized for their involvement in key epidermal functions, including cell proliferation, migration, wound healing, epidermal regeneration and barrier regulation.

Among the numerous ORs identified in the skin, three receptors appear of particular interest:

OR2AT4, previously associated with keratinocyte renewal and epidermal regeneration.

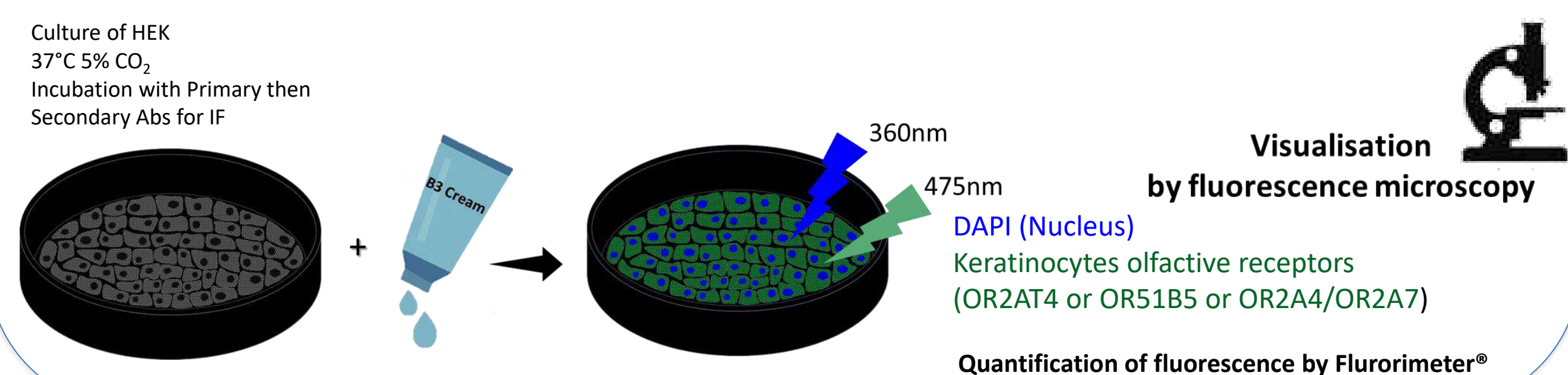
OR51B5, expressed in the skin, although its physiological function remains poorly understood.

OR2A4/7, implicated in oxidative stress responses and barrier regulation.

This study aimed to evaluate whether a dermocosmetic healing cream could modulate the expression and intracellular localization of these cutaneous ORs, thereby supporting their potential role in epidermal repair mechanisms.

MATERIALS & METHODS

Primary human epidermal keratinocytes (HEK) were cultured and incubated with dermocosmetic cream containing vitamin B, Urea, a polysaccharide complex and an active perfume ingredient. Olfactory receptors (**OR2AT4**, **OR51B5**, **OR2A4/7**) were detected using primary antibodies and fluorescent secondary antibodies. Nuclei were counterstained with DAPI and visualization was performed by fluorescence microscopy.



In order to validate the correlation between the ORs expression and the migratory capacity of human keratinocytes, a scratch test was performed and wound closure was recorded every 24 h.

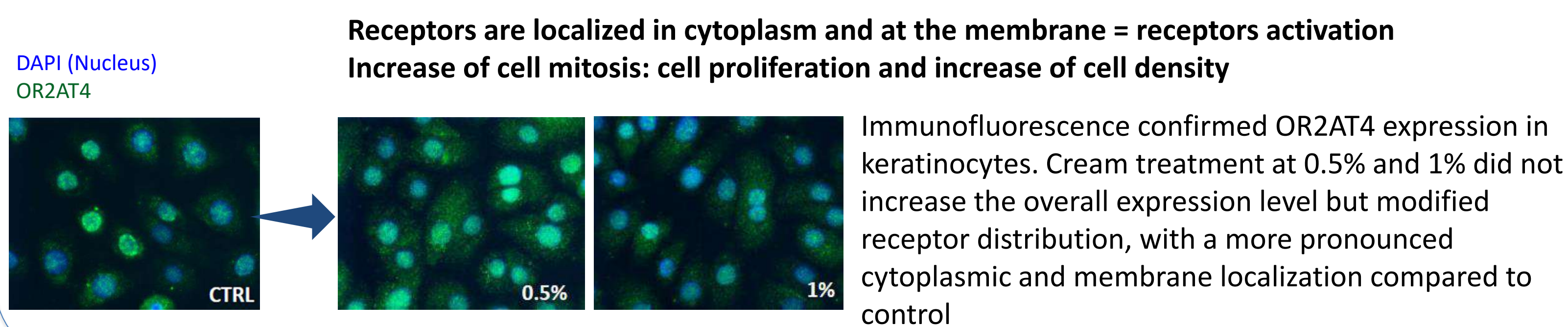


CONCLUSION

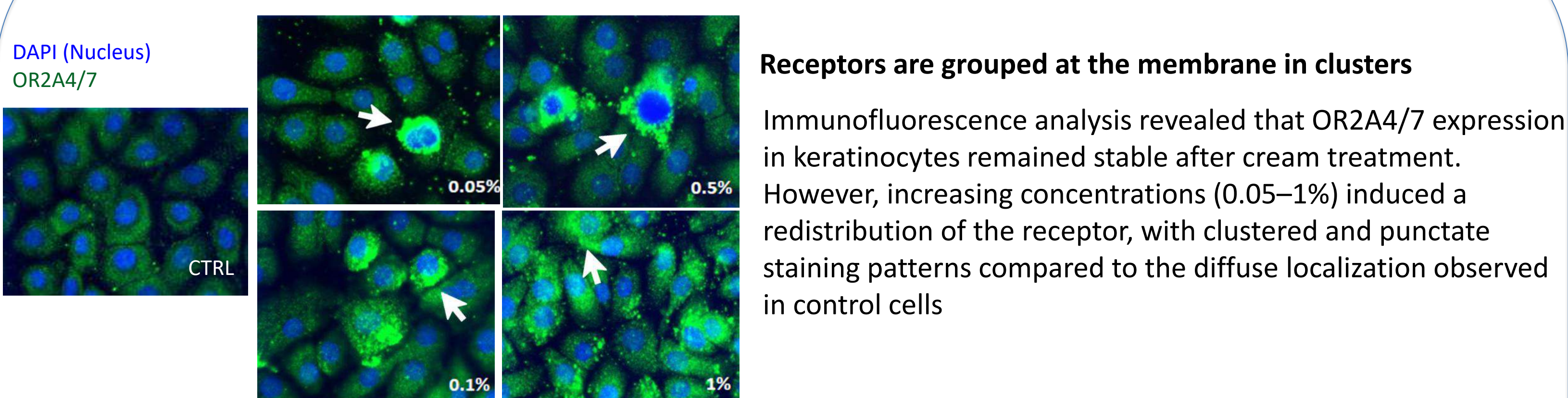
- The formulation modulates the expression and localization of olfactory receptors OR2AT4, OR51B5, and OR2A4/7 in human keratinocytes.
- In scratch test, a significant enhancement in keratinocyte migration was observed even at low concentrations. In addition, a dose-dependent effect has been observed with a 36–38% increase after a tenfold increase in product concentration.
- These findings open a new era in evaluation of the active perfums in the field of cosmetology.
- Clinical data is missing encouraging further studies on skin regeneration and anti-aging effects.

RESULTS

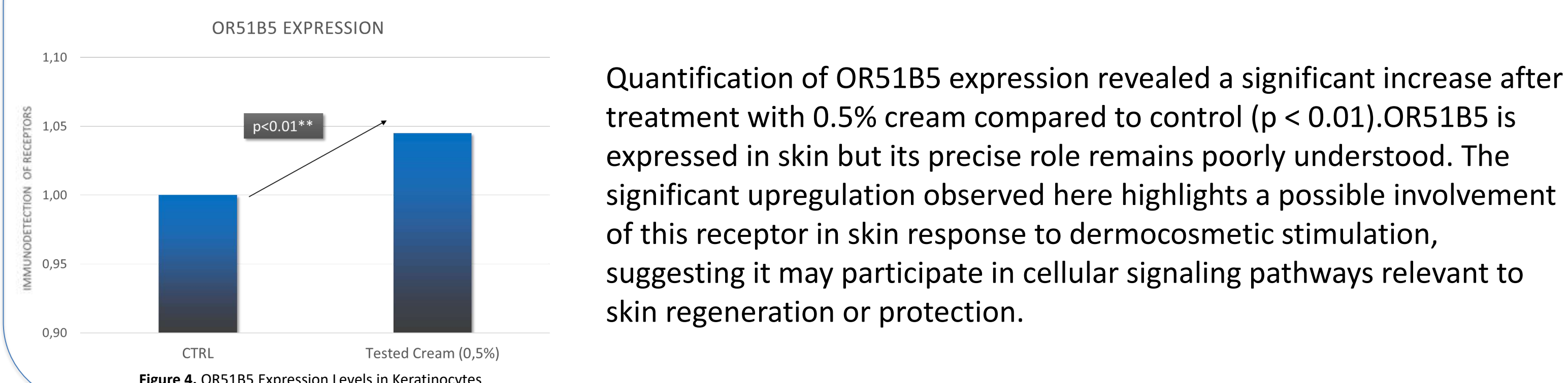
OR2AT4 RECEPTORS : Well-characterized olfactory receptor involved in keratinocyte proliferation, migration, and wound healing process



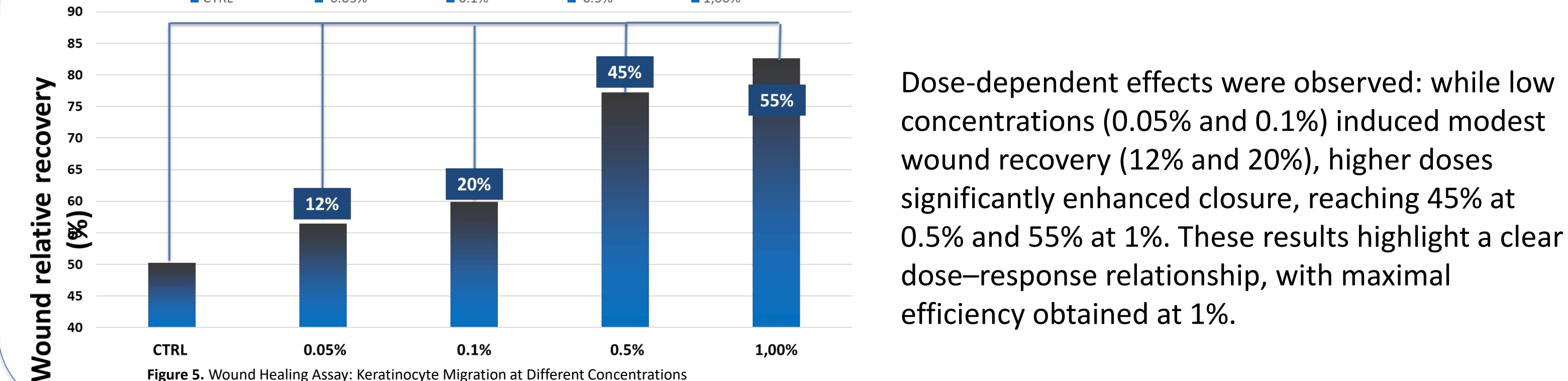
OR2A4/7 RECEPTORS : Receptors associated with oxidative stress regulation and skin barrier function



OR51B5 RECEPTORS : Cutaneous receptor with poorly defined role, potentially linked to cellular migration.



SCRATCH TEST : In vitro model used to assess keratinocyte migratory capacity and wound closure efficiency



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