

A new *ex vivo* skin model to mimic pollen allergens exposition and evaluate preventive or cleansing effects of skin care products

Penno-Mazzarino, Laurent¹; Percoco, Giuseppe¹; Lecland, Nicolas²; Scalia, Julie²; Lati, Elian¹; Trompezinski Sandra²
1 Laboratoire BIO-EC, LONGJUMEAU, France; 2 NAOS Institute of Life Science, Aix-en-Provence, France.



Introduction

By their morphology and function, **infundibula** are natural site of accumulation of many exogenous elements, such as microorganisms, chemicals, pollutant matters or allergens such as **pollen allergens**.

In most cases this **accumulation** is a source of discomfort but it may lead to severe allergic reactions in sensitive subjects. The development of care products protecting against the accumulation of pollen in the infundibula or of products facilitating the elimination of pollen deposits is of great importance for people with allergies and can limit the sensitization.

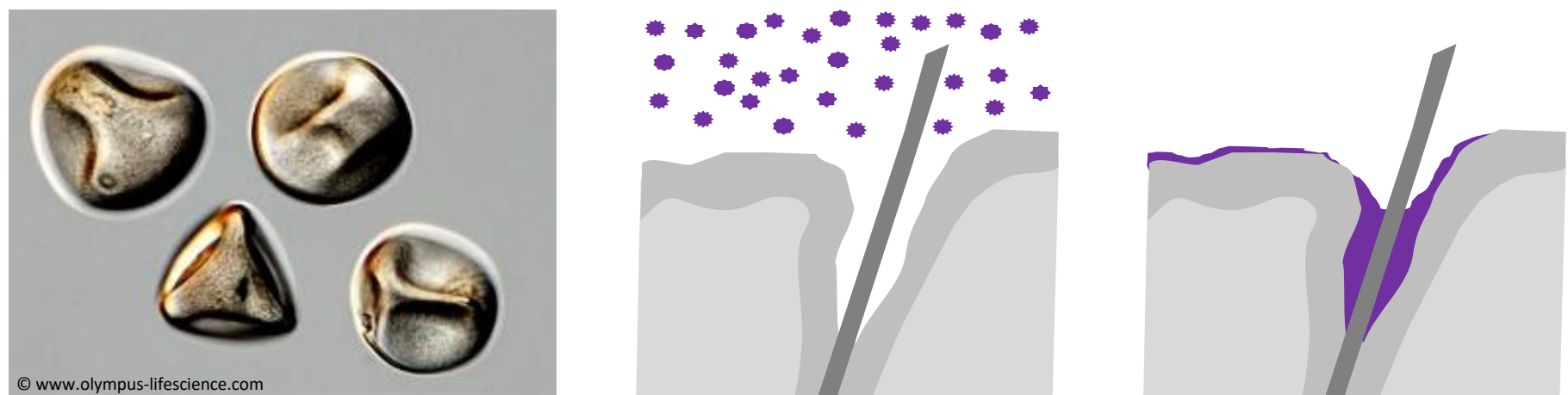
In order to evaluate the preventive or cleansing efficacy of care or hygiene skin products, a new model using hairy skin explants on Perfex *vivo* supports was developed to mimic the accumulation of pollen allergen in hair follicles *infundibula*.

Materials & Methods

Skin explants were obtained from an abdo-plasty of a 33-year-old Caucasian male and were set up on BIO-EC's **Perfex vivo®** system.



Recombinant pollen allergen Phl p 5b (Abcam ref. ab225974, **Timothy grass pollen**) was applied topically for 6 hours.



Product application (preventive or curative) were carried out to define if pollen allergen accumulation in infundibulum can be reduced or removed.

- **Film forming product** was topically applied at the rate of $2\mu\text{L}/\text{cm}^2$, 10 min prior to pollen exposure.
- **Cleansing product** was applied after 6 hours of pollen exposure. Skin surface was rubbed with two cotton discs soaked with the product.

Pollen accumulation was revealed by **immunohistochemistry** using anti-Phl p 5b antibody (Biorbyt, ref orb51666) and peroxidase technic.

The stainings were observed by microscopy and pictures of infundibulum areas were obtained.

The percentage of the region of interest (infundibulum) covered by the staining (stained surface percentage) was determined by **image analysis**. Unpaired t-test were performed to compare experimental groups.

Conclusions

The model based on hairy skin explants on **Perfex vivo** support allows to mimic skin exposure to pollen allergens and their deposit in infundibula. This model can highlight protective effects of film forming products by reducing the accumulation of pollen on the skin and permits to evaluate cleansing effects of products applied to remove pollen from the skin.

References

Acknowledgements This development has been financed by Laboratoire BIO-EC and NAOS Institute of Life Science.

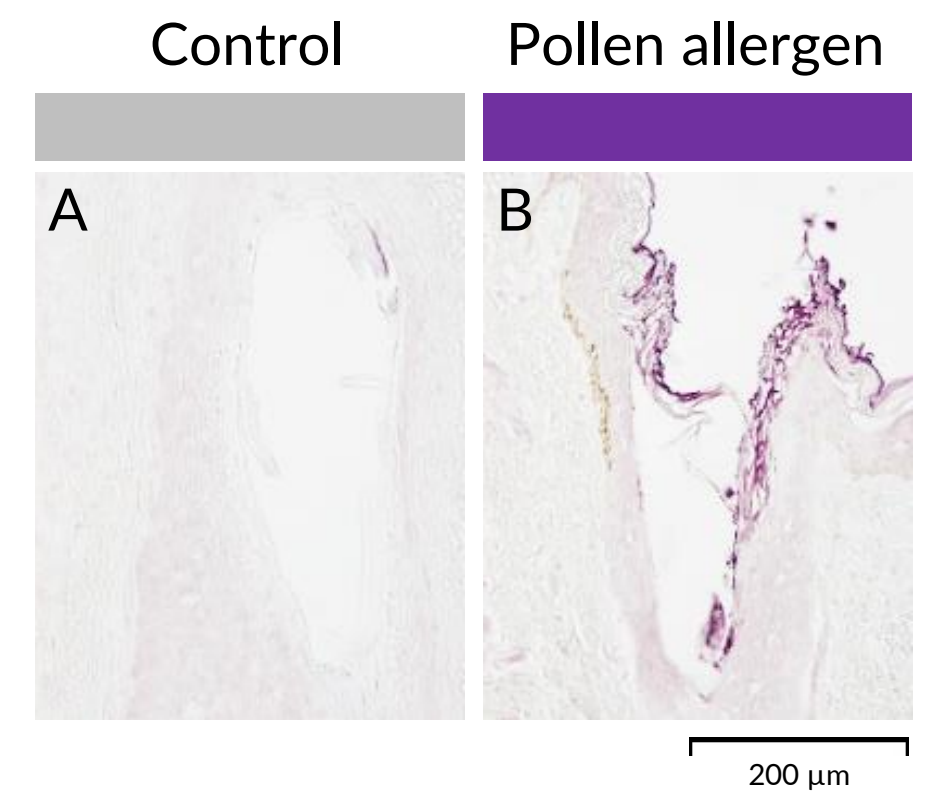
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Results & Discussion

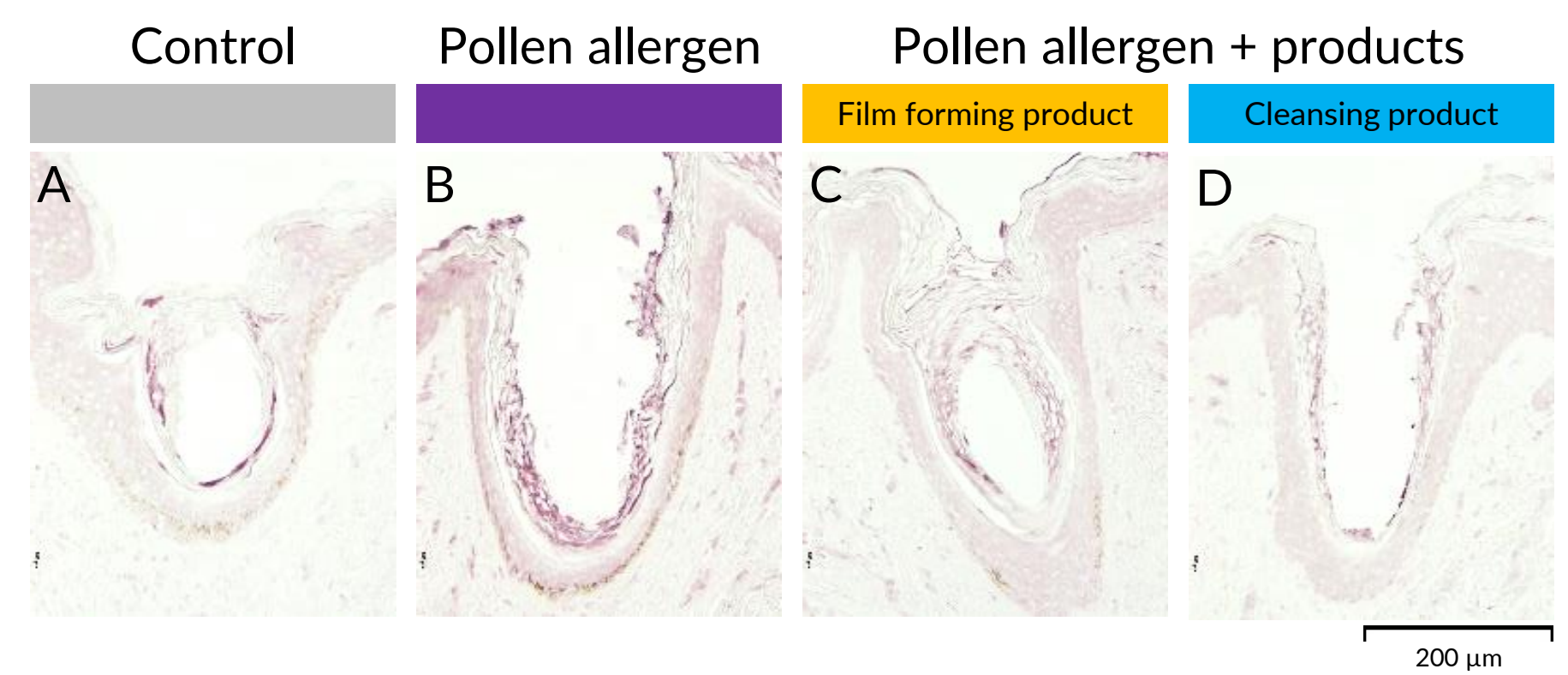
Model development

Immunostaining of pollen allergen in infundibulum. **Slight non-specific staining** was observed on **control** condition (A).

Clear staining was observed on **pollen allergen-exposed** condition (B).

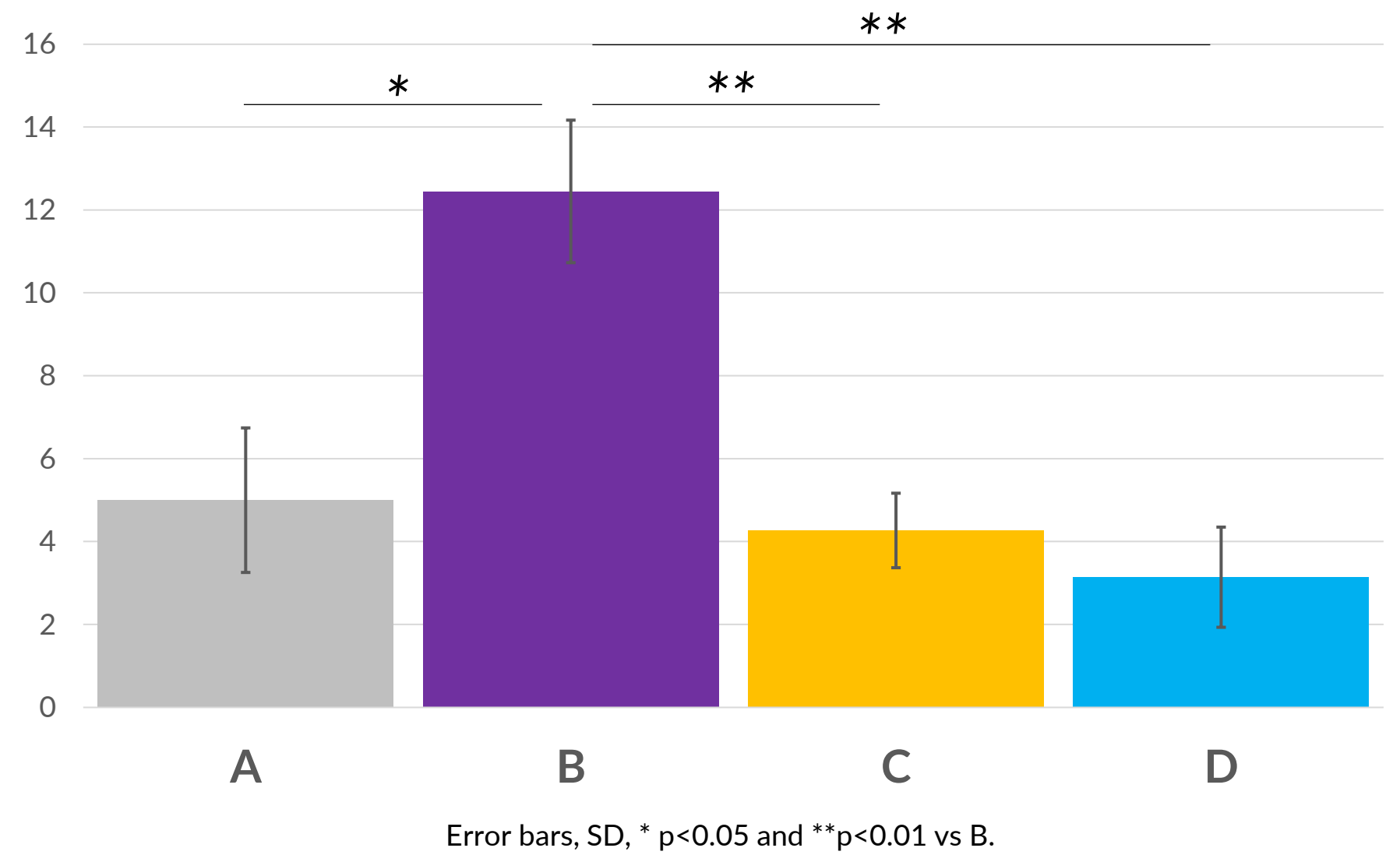


Products testing



Control (A) showed a slight non-specific staining. After pollen allergen exposure, a clear staining was observed (B). Preventive treatment with **film-forming product** led to an important decrease of pollen allergen staining (C). **Cleansing product** removed a high amount of pollen allergen (D).

Image analysis: surface percentage of the infundibula positive to pollen staining.



Pollen allergen exposure induced a significant increase in pollen allergen accumulation in infundibula by 149%*.

The **preventive** application of the **film forming product** completely **prevented pollen allergen accumulation** in the infundibulum. **Cleansing** with a cosmetic product following pollen exposure **significantly remove accumulated pollen** from infundibula.