

STIMULATION OF EPIDERMAL HYALURONAN BY YEAST FERMENT

R Osborne¹, T Hakozaiki², B Jarrold¹, L Mullins¹
P&G Beauty, Cincinnati, Ohio, USA¹ and Kobe, Japan²

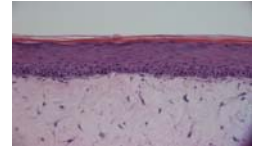
INTRODUCTION

Hyaluronan is a major component of the extracellular matrix of skin, responsible for maintaining overall hydration and elasticity.¹ A decline in epidermal hyaluronan content occurs during aging, contributing to decreased turgidity and increased wrinkle formation.² Yeast Ferment Filtrate reduces generation of reactive oxygen species in skin cells *in vitro*.³ In the current work, additional skin cell responses to Yeast Ferment Filtrate were examined, with focus on hyaluronan.

OBJECTIVE

The purpose of the current work was to evaluate the effects of topically-applied yeast ferment filtrate on expression of hyaluronan in human skin equivalent cultures.

Figure 1. Human Skin Equivalent Culture



METHODS

Yeast Ferment Filtrate (Pitera®, The Procter & Gamble Company) was applied to the stratum corneum surface of human skin equivalent cultures, the MatTek Human Skin EpiDermFT Model (MatTek Corp., Ashland, MA USA). Hyaluronan levels in cell extracts were determined by ELISA (Corgenix, Westminster, CO USA) and normalized to protein (Coomassie blue staining).

Hyaluronan was localized in frozen sections of human skin equivalent cultures by immunohistochemistry, using biotin-labeled hyaluronan binding protein (U.S. Biologicals, Swampscott, MA USA) and monoclonal anti-biotin conjugated with Texas Red (Jackson ImmunoResearch Laboratories, West Grove, PA USA). The sections were counterstained with DAPI.

RESULTS

Hyaluronan Expression

Three separate lots of Yeast Ferment Filtrate were evaluated in independent experiments in the human skin equivalent culture model. Hyaluronan expression was increased from 128 to 178% of control in these experiments (Fig. 2). The increase in hyaluronan was statistically significant ($p < 0.05$) versus the concurrent controls (water only).

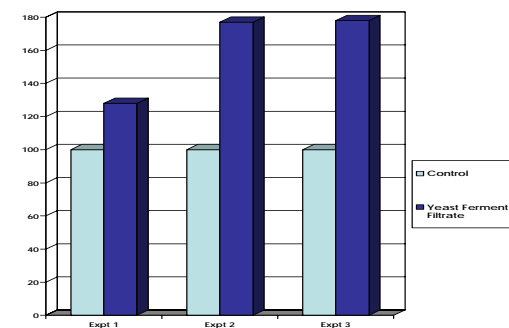


Figure 2. Increased Hyaluronan expression (ELISA) in human skin equivalent cultures treated with Yeast Ferment Filtrate.

CONCLUSIONS

- Yeast Ferment Filtrate increased the expression of hyaluronan in human skin equivalent cultures (Fig. 2).
- The increased hyaluronan was located in the epidermis of the cultures (Fig. 3).
- These results indicate that Yeast Ferment Filtrate increases hyaluronan expression by cultured skin cells, specifically epidermal cells.

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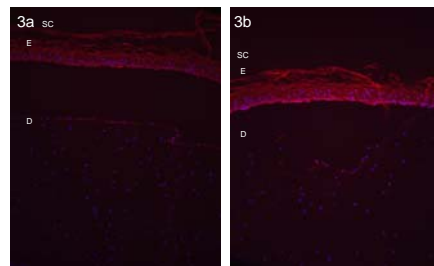


Figure 3. Increased Hyaluronan expression with Yeast Ferment Filtrate (b) as compared to control (a).

SC = stratum corneum, E = epidermis, D = dermis. 100x.

Localization of Hyaluronan

Immunohistochemistry analysis was used to determine the skin site of increased expression of hyaluronan in response to Yeast Ferment Filtrate. Epidermal hyaluronan expression (red stain in Fig. 3b) was increased in response to Yeast Ferment Filtrate, while dermal expression appeared low and unchanged as compared to control (Fig. 3a). The hyaluronan staining was specific, since no Texas red-labeled antibody staining was detected in the absence of biotin-labeled binding protein (not shown).

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