

# Tretinoin and retinol bioactivity are retained when layered with adjunctive water gel moisturizer or a water cream moisturizer in an “open sandwich” regimen

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# Introduction, Objective, and Methods

## Introduction

- Retinol and tretinoin are widely used to treat acne, psoriasis, and symptoms of photoaging. Despite their many beneficial effects, topical retinoids can cause local irritation manifested as redness, scaling, and dryness. Adjunctive moisturization is often recommended for facilitating facial retinization, but the impact on retinoid bioactivity from various layering techniques has not been evaluated.
- Lightweight water gel and water cream moisturizers have been clinically shown to provide immediate and long-lasting skin hydration and barrier improvements. They were also well tolerated in patients with atopic dermatitis, rosacea, acne vulgaris, and sensitive skin.

## Objective

- Lightweight water gel and water cream moisturizers were selected as adjunctive moisturizers in an ex vivo regimen study assessing retinoid bioactivity effects of topical retinol and tretinoin treatments.

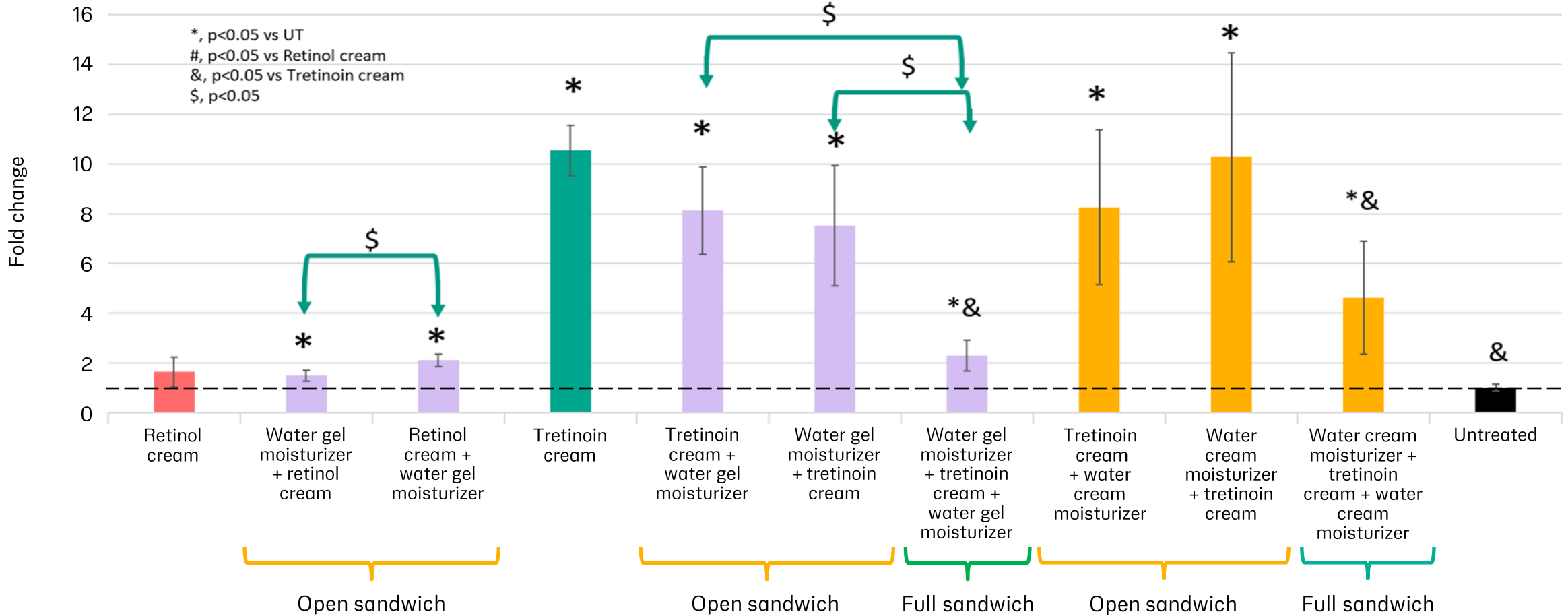
## Methods

- Retinol 0.1% cream and Tretinoin 0.025% cream were tested in combination with lightweight water gel and water cream moisturizers on human skin biopsies from abdominoplasty of a Caucasian female.
- Human skin explants were treated topically for 48 hours with (1) the retinoid formula alone, (2) a 2-step regimen of retinoid + moisturizer or moisturizer + retinoid (open sandwich), or (3) a 3-step regimen of moisturizer + retinoid + moisturizer (full sandwich). Four biopsies per treatment were used. RNA extraction was done at the end of study, and quantitative polymerase chain reaction (qPCR) analyses were performed.
- Retinoid-induced bioactivity was examined via HBEGF and HAS3 gene expressions.

# RESULTS

Explants treated with “full sandwich” regimen demonstrated reduced retinoid bioactivity ( $p < 0.05$ ) as shown by *HBEGF* gene expression. Explants treated with the “open sandwich” regimen in either order of application maintained comparable bioactivity to the retinoid treatment alone as shown by *HBEGF* gene expression

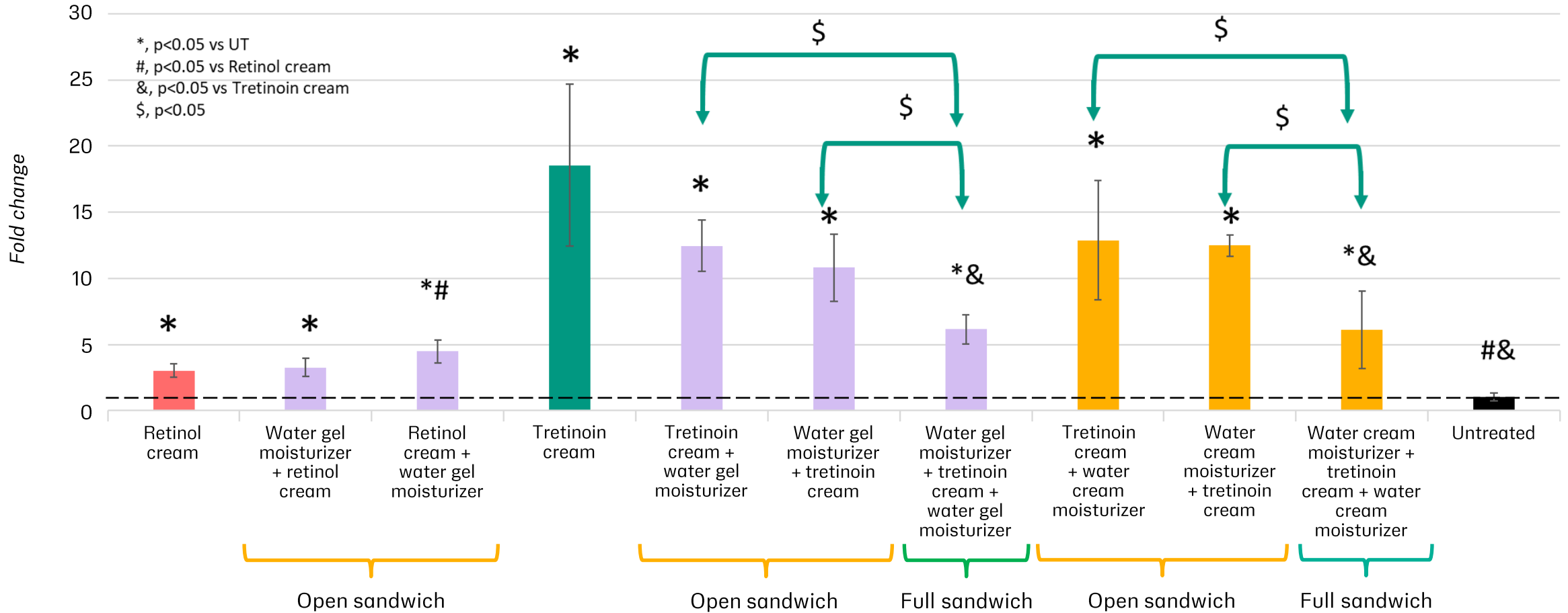
*HBEGF* normalized to TBP



# RESULTS

Explants treated with “full sandwich” regimen demonstrated reduced retinoid bioactivity ( $p < 0.05$ ) as shown by *HAS3* gene expression. Explants treated with the “open sandwich” regimens in either order of application maintained comparable bioactivity to the retinoid treatment alone as shown by *HAS3* gene expression

*HAS3* normalized to TBP



# Conclusions

- Explants treated with “full sandwich” regimen demonstrated reduced retinoid bioactivity ( $p < 0.05$ ), indicating lower penetration.
- Explants treated with the “open sandwich” regimens in either order of application maintained comparable bioactivity to the retinoid treatment alone, demonstrating compatibility of the regimen.
- These data support the “full sandwich” method for new retinoid users who may experience sensitivity from retinization during the skin acclimation period.
- Furthermore, these data suggest that the water gel or water cream moisturizer can be used long-term in the “open sandwich” regimen with topical retinoids to provide barrier benefits without impacting retinoid bioactivity.