

Mitigation of Damage Induced by Environmental Pollution by Feverfew Extract

**Frank Sun, Mark Benn, Katrina Bernhardt, Wen-Hwa Li,
Fang Liu-Walsh, Katherine Skinner, Anne Yuqing Yang**

Johnson & Johnson Consumer Inc, Skillman, NJ, USA

Disclosures: This work was sponsored by Johnson & Johnson Consumer Inc.

All authors are employees of Johnson & Johnson Consumer Inc.

Background

- Consumers are constantly looking for more from their sun care products, thus a sun protection platform was created to provide invisible protection and expand the definition of protection beyond sun to total defense from the environment.
- One interacts with a plethora of different environmental aggressors daily, namely: 1) ultraviolet (UV) radiation, 2) atmospheric pollutants, 3) particulate matter pollutants, 4) indoor heating and cooling (decrease humidity and can lead to drier skin), and 5) environmental ozone (a powerful oxidant).
- Feverfew is an aromatic perennial, widely cultivated throughout Europe, and has been used for centuries as a source of herbal remedies. The Feverfew extract in this platform is a patented Parthenolide-Free Extract (PFE), which enables Feverfew to be used in topical skincare without risk of skin sensitization.
- The purpose of the current study is to determine the ability of Feverfew PFE to mitigate the deleterious effect of external aggressors and UV damage on skin health by quantifying the barrier function of the skin through transepithelial electrical resistance (TEER) and inflammation through interleukin 1 α (IL-1 α) secretion in a human epidermal skin-equivalent model.

Materials and methods

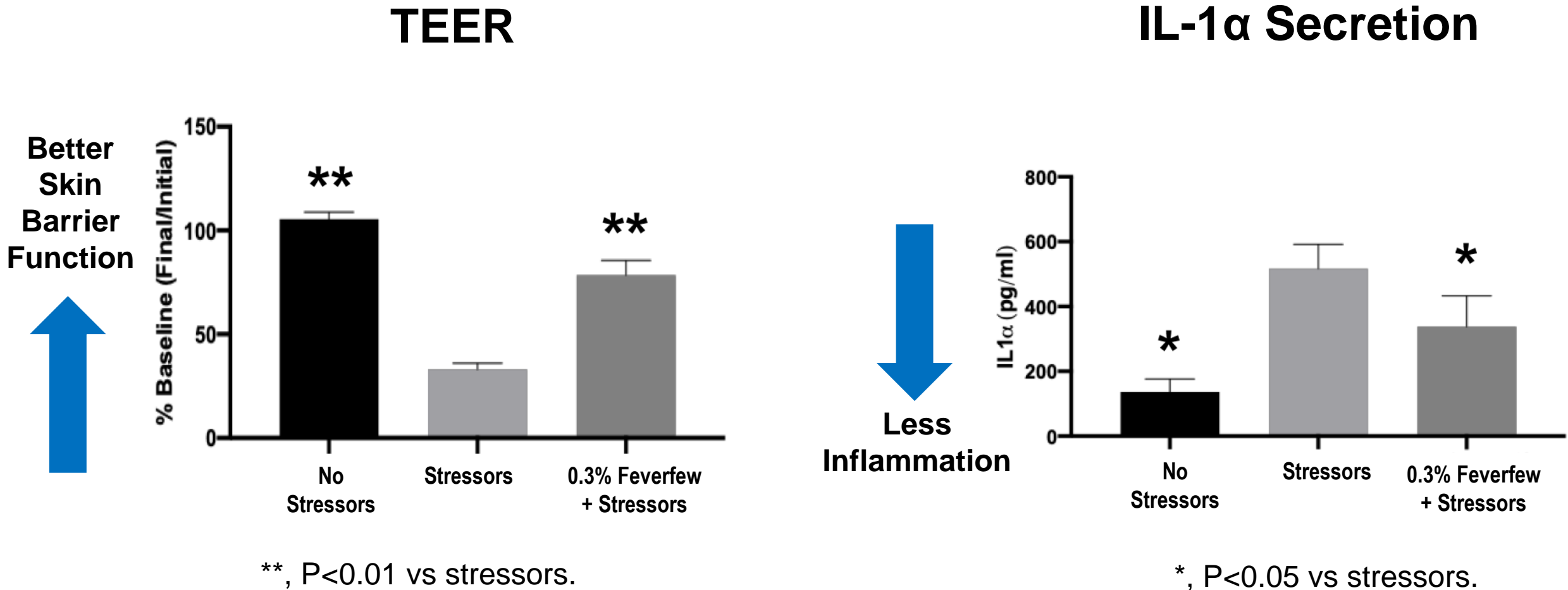
Materials:

- Human epidermal skin equivalents (MatTek EPI-200™)
- 0.3% Feverfew (diluted in phosphate buffered saline)

Methods:

- Topical pretreatment of human epidermal skin equivalents with 0.3% Feverfew for 3 hours
- The human epidermal skin equivalents were treated with:
 - No stressors
 - Stressors (smoke, ozone, cold, heat, and UV lights)
 - 0.3% Feverfew + stressors
- **Endpoint evaluation by:**
 - TEER: Increased TEER values correlates to better skin barrier
 - IL-1 α : Decreased IL-1 α secretion correlates to decreased skin inflammation
- **Statistical significance was determined using one-way analysis of variance (ANOVA) and Dunnett post-hoc test (GraphPad Prism software).**

Feverfew PFE improved barrier function and inhibited IL-1 α secretion induced by environmental stressors in human epidermal skin equivalents



Conclusions

- **Human epidermal skin equivalents pre-treated with Feverfew PFE were shown to have significantly better barrier function ($P < 0.01$) and inhibition of IL-1 α secretion ($P < 0.05$) than those that were not pre-treated with Feverfew PFE when exposed to the stressors.**
- **By mitigating inflammation as well as disruption of the skin barrier function, Feverfew PFE demonstrated the ability to help reinforce the natural defenses of the skin against the cumulative damage caused by environmental aggressors.**