



Beneficial impact of mildly heat treated Lactobacillus plantarum HEAL19 on health and microbiome of atopic dermatitis prone skin

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Introduction:

Atopic dermatitis is a common chronic inflammatory skin disease and is characterized by cracked, swollen, red, and itchy skin (Fyhrquist, 2019). The dominant genus in AD flares of the microbiome is Staphylococcus, especially Staphylococcus aureus (Kong, 2012). To maintain the natural skin microbiome and barrier, new strategy need to be investigated to break the vicious circle of a weak skin barrier and the increase in S. aureus population in AD patients.

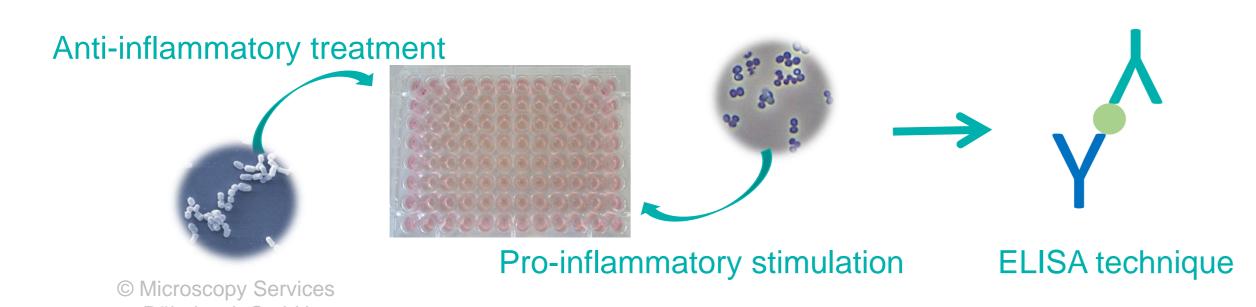
We investigate whether the mildly heat treated probiotic bacterium Lactobacillus plantarum HEAL19 (Lp HEAL19) can support atopic dermatitis prone skin and its microbiome.

Human Beneficial Body dependence biome

Materials & Methods:

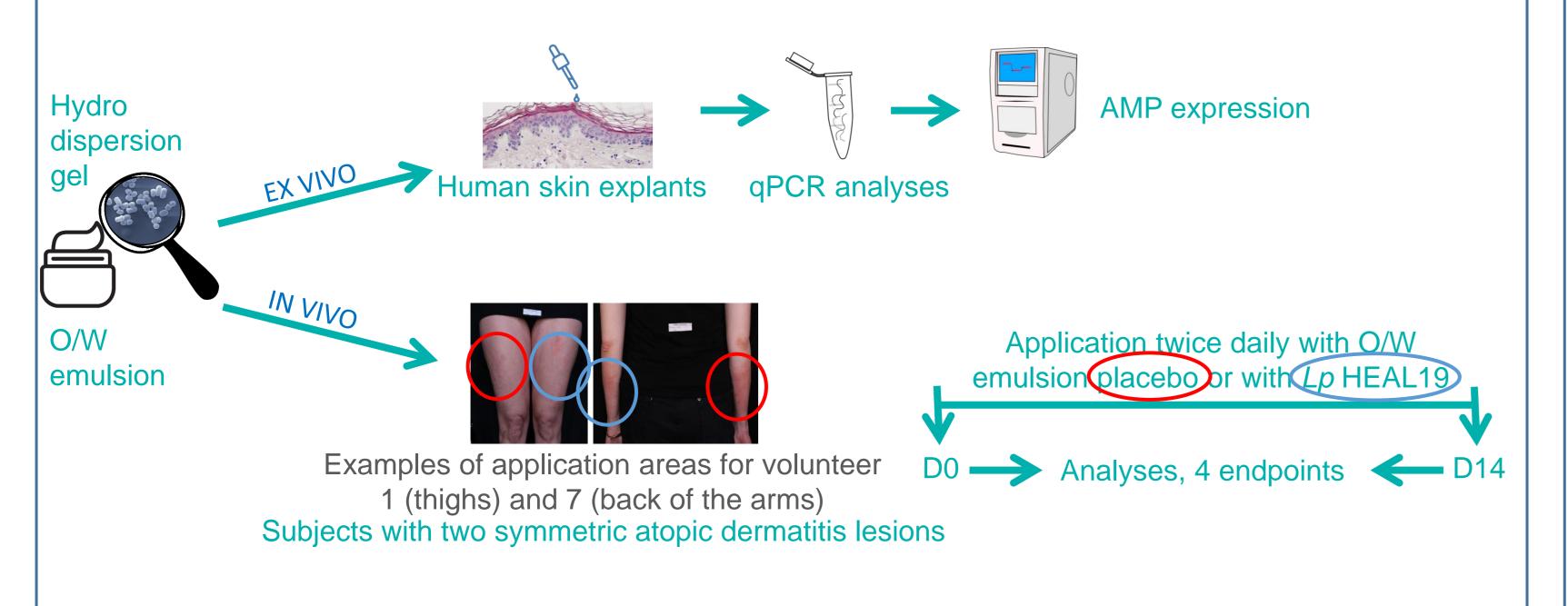
IN VITRO - Anti-inflammation

Investigation of the ability of heat treated Lp HEAL19 to reduce production of the inflammation marker IL-8 induced by *S. aureus on* keratinocytes



EX VIVO – Filaggrin production and AMP induction

- Investigation of the production of filaggrin (FLG) as a marker of skin barrier fortification in ex vivo human skin explants (data not shown)
- Detection of anti-microbial peptide (AMP) expression levels in human ex vivo skin explants treated topically with a hydro dispersion gel containing heat-treated *Lp* HEAL19



IN VIVO – Study with subjects suffering from mild to moderate atopic dermatitis

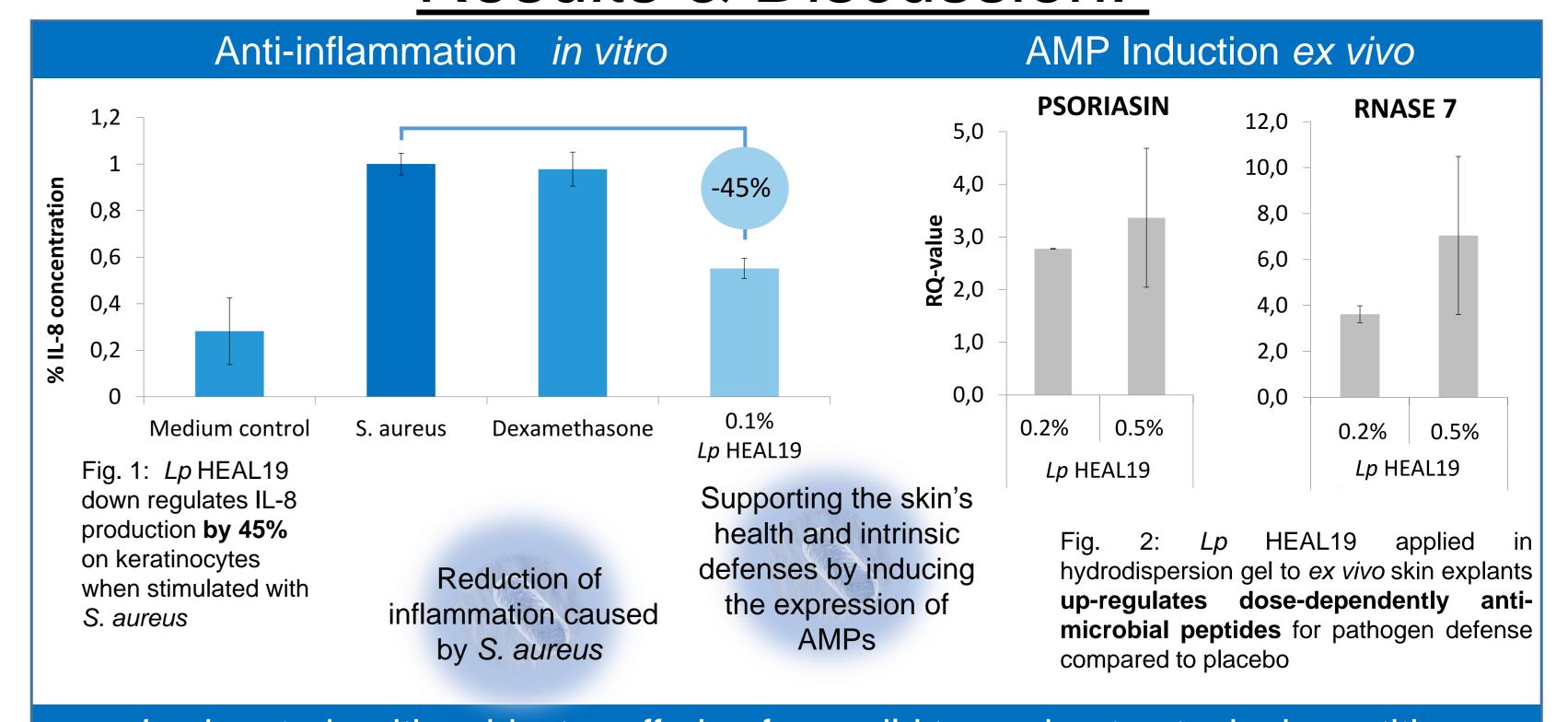
Performance of a in vivo study with 13 subjects suffering from mild to moderate atopic dermatitis (15≤SCORAD≤40) that have two symmetric atopic dermatitis lesions

- SCORAD (SCORing Atopic Dermatitis) is a clinical scale used to assess the extent and severity of eczema
- Based on the six clinical characteristics used in SCORAD: erythema, edema/papulation, oozing/crust, excoriation, lichenification and dryness
- Visual aspect and evaluation of redness by visual evaluation
- **Evaluation of Transepidermal Water Loss**
- Microbiome sampling

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Results & Discussion:



In vivo study with subjects suffering from mild to moderate atopic dermatitis

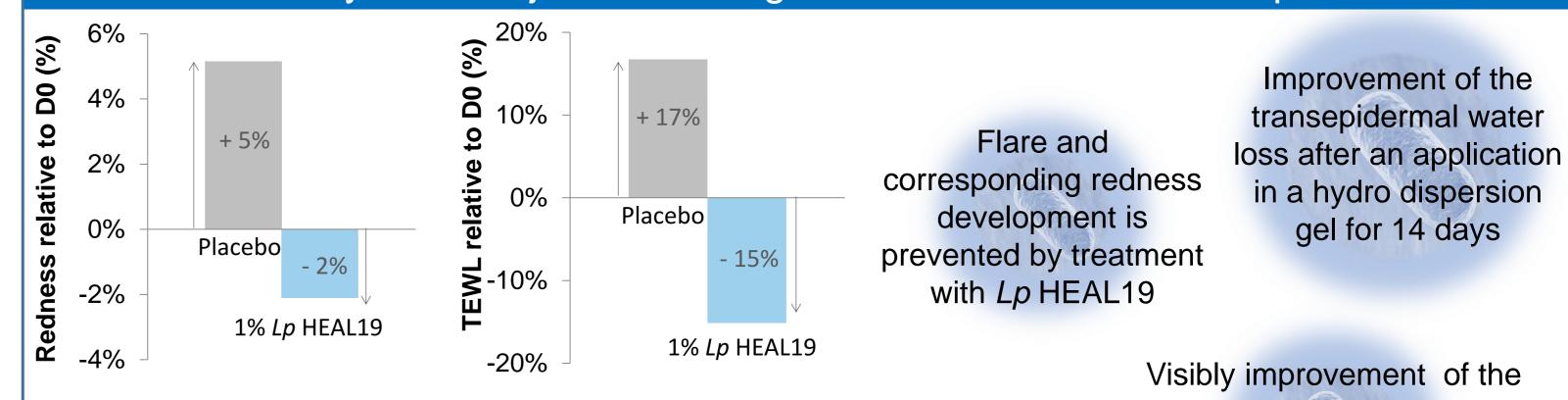
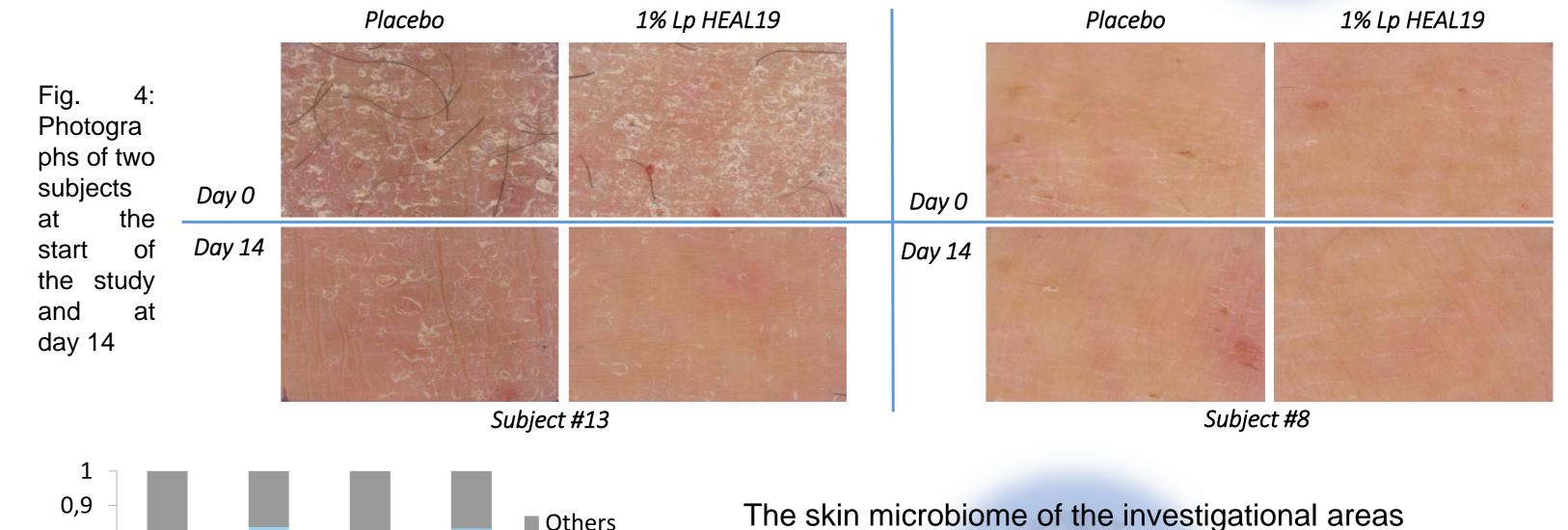


Fig. 3: Evaluation of redness (left) and transepidermal water loss (TEWL) (right) at the start of the study and at day 14

appearance of atopic dermatitis prone skin after only 14 days of treatment



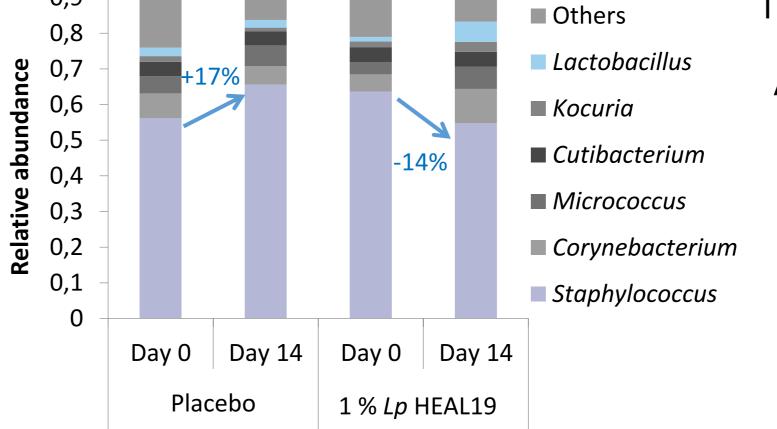


Fig. 5: Microbiome analyses of 13 subjects (male & female;

is dominated by the genus Staphylococcus. After 14 days of placebo treatment the relative amount of Staphylococcus increases by 17 % along with the flare development whereas it decreases by 14 % after treatment with mildly heat treated *Lp* HEAL 19

> Only 1% of the ingredient used twice daily for 14 days of application leads to positive changes in the microbiome composition and a visible improvement of the skin health.

(15≤SCORAD≤40). Application of hydro dispersion gel twice daily on the investigational areas. Swabs were taken at the start of the study and at day 14 for 16S sequencing

Conclusions:

The use of mildly heat treated *Lp* HEAL19 supports the skin's health and prevents the development of an AD flare as it reduces the skin redness, strengthens its barrier, and improves its intrinsic defenses. All without having an impact on the microbiome itself, which in turn allows the microbiome to recover naturally.

The understanding of the interaction between our skin and our skin's microbiome will revolutionize the future cosmetic ingredient developments.

References:

- Fyhrquist N, Muirhead G, Prast-Nielsen S, Jeanmougin M (2019) Microbe-host interplay in atopic dermatitis and psoriasis. Nature Com 10:4703
- Kong HH, Oh J, Deming C, Colan S, Grice EA, Beatson MA, Nomicos E, Polley EC, Komarow HD, NISC Comparative Sequence Program, Murray PR, Turner ML, Serge JA (2012) Temporal shifts in the skin microbiome associated with diseases flares and treatment in children with atopic dermatitis. Genome Research 22:850-859