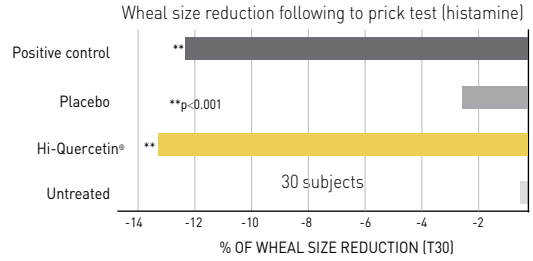
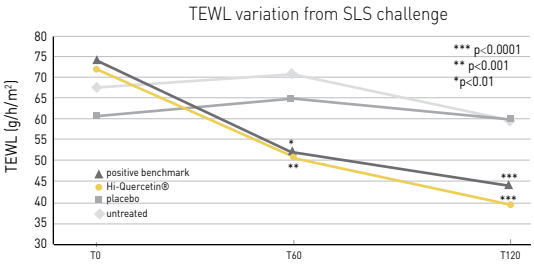
CLINICAL EFFICACY ON CHALLENGED SKIN[2]

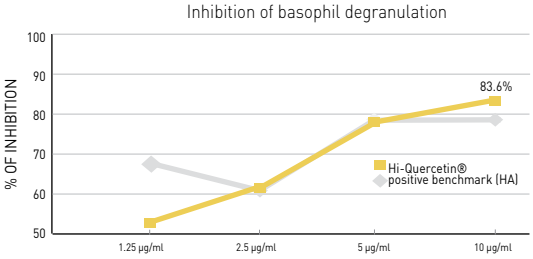
A single blind, placebo controlled human trial on 30 subjects has been conducted by inducing specific skin challenges causing redness, skin barrier disruption and allergic-like challenges following to the exposure to the following conditions: histamine(1%); UV irradiation; exfoliation induced by glycolic acid; skin barrier disruption induced by SLS. The Hi-Quercetin® soothing efficacy (in a 1% formulation) was tested at different times (according to the challenge model) and compared to the blank sample and a positive reference. In the histamine challenge, the wheal size was 13.25% smaller ($p<0.001$), even smaller than the positive benchmark. The redness following to UV challenge in the treated area was over 10% less intense compared to the placebo area ($p<0.01$). The SLS challenge has induced a skin barrier disruption evaluated by TEWL, and at 4 hours from the challenge and products application TEWL was 38.10% lower ($p<0.001$), overperforming the positive benchmark. Finally the challenge induced by glycolic acid, measured by Mexameter, decreased by almost 17% ($p<0.0001$). All other assessed parameters have been ameliorated, i. e. reported itch on the prick test, skin hydration, redness, in all challenges have been reported to significantly ameliorate skin conditions.





IN VITRO INHIBITION OF BASOPHIL DEGRANULATION

Aim of this test was to evaluate the capacity of Hi-Quercetin® to inhibit basophil degranulation.[3] Basophil degranulation is induced by specific allergens interacting with the IgE receptor located on the granulocyte surface. Basophil degranulation was compared to a positive benchmark (Hyaluronic Acid, HA) and β-hexaminidase was quantified as a marker of degranulation. Hi-Quercetin® resulted effective in a dose dependent way in inhibiting basophil degranulation up at a level of 83.6% (at a 10µg/ml), overcoming the performance of the positive benchmark.



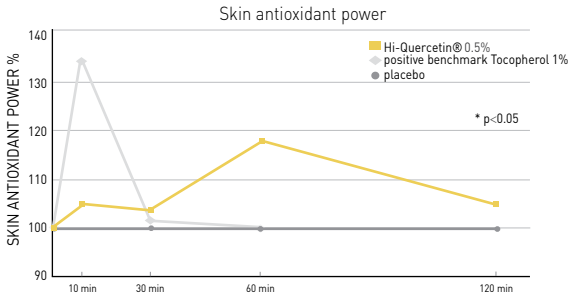
ANTIOXIDANT CHALLENGE AND INHIBITION OF ROS

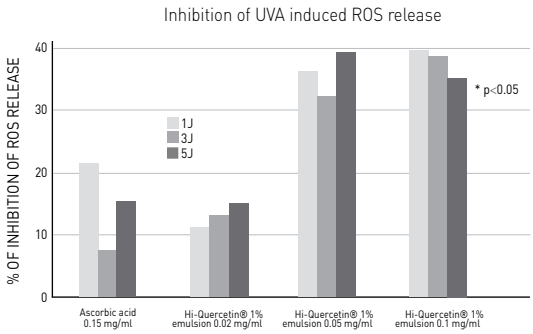
Different tests aiming at the determination of the antioxidative efficacy of Hi-Quercetin® in cosmetic applications, were performed. The antioxidant capacity, reactivity, oxidation resistance and long term stability is to be evaluated with relevance to cosmetic formulations, skin intrinsic antioxidant capacity and ROS release inhibition.

Determination of the Skin Antioxidative Protection (SAP):[4] Hi-Quercetin® was tested for its ability to permeate the epidermis and enhance the skin's antioxidative defence system by 17% at the given concentration (0.5%) in a inert delivery system. It even overperformed the positive benchmark tocopherol (1%) by 125% (AUC).

Determination of the Antioxidant Power (AP):[4] this *in vitro* standard diagnostic, benchmarked to vitamin C, has allowed to determine the antioxidative capacity and reactivity of Hi-Quercetin®. It has shown an antioxidant capacity that was fully maintained inside a cosmetic formulation (O/W emulsion) even after 48h at 40°C storage.

Protective effect against UV induced oxidative stress:[5] when applied to a stabilized human keratinocytes cell line, Hi-Quercetin® was shown to significantly inhibit UVA induced ROS production al all tested dosages. Specifically, at the 0.05 mg/ml dosage and with the highest energy challenge (5J), ROS production was still reduced by 39.87%, overperforming by far ascorbic acid tested as positive benchmark.





DID YOU KNOW...

Quercetin is a powerful antioxidant, reported to be more potent than ascorbic acid and tocopherol. [6]It is also a powerful enzyme manipulator being a selective inhibitor of pro-inflammatory metabolites. [9] Also, it is one of the most abundant and ubiquitary secondary metabolites of the whole botanical kingdom,[7] where it also plays the role of a pigment to attract pollinators.

1.ISO/FDIS 16128-1, **2014**. - 2. IARC Monographs, Vol 73, **1999**. - 2. Abich report REL/533/2015/CLI/SAB, **2015**. - 3. Abich report