Joint interview with Pr. Jan Frank from Institute of Biological Chemistry and Nutrition at the University of Hohenheim in Stuttgart, Germany, Jocelyne Franchi, Scientific Coordinator for Dior Science, France and Laure Pasquier, Researcher at LVMH Recherche, France.

We are hearing a lot about Integrative Medicine these days as a more holistic approach to healthcare. The idea here is that complementary treatments, such as phytotherapy and nutrition, when used in conjunction with conventional therapies, should lead to better overall results.

Plants naturally contain a plethora of chemical molecules, some of which may have nutritive properties or antioxidant, antibacterial, antifungal or anti-inflammatory activity. “In its simplest form, Integrative Medicine is when patients are given high doses of plant compounds - curcumin and resveratrol are two better-known examples here - in addition to standard medical treatments,” explains Jan Frank of the Institute of Biological Chemistry and Nutrition at the University of Hohenheim in Stuttgart, Germany. “Curcumin (which is the yellow dye from the rhizome of Curcuma longa, or turmeric) is being studied for its potential as an adjuvant therapy, for instance, because many recent cell culture and animal studies have shown that it can act as an anti-inflammatory.”

**SYNERGISTIC TREATMENTS LEAD TO BETTER EFFICACY**

“Together with Mohamed Khayyal’s team at the University of Cairo, Egypt, we recently found that curcumin in a certain (micellar) form is more potent than diclofenac in reducing concentrations of C-reactive protein (a marker of systemic inflammation) in an animal model of arthritis,” he says. “When combined with micellar boswellic acids, derived from the Boswellia plant, micellar curcumin reduces the concentrations of C-reactive proteins even further in arthritic rats.

“Another study has shown that a two-month treatment with ω3 fatty acids plus curcumin decreases the frequency of migraine attacks in a trial with 74 patients. It does this by reducing the concentration of the inflammatory cytokine TNFα in blood serum compared to a placebo or to treatment with either of the bioactive molecules alone.”

Using two or more bioactive molecules in such a complementary, synergistic way allows the compounds to act on different molecular targets in the body at the same time. “In nutritional medicine, for example, one compound may reduce the absorption of cholesterol in the intestine while another the synthesis of new cholesterol in the liver,” explains Frank. “Again, if both compounds are allowed to act together, they decrease cholesterol levels to a greater extent than either one of them alone.”

**COSMETICS INSPIRED BY INTEGRATIVE MEDICINE**

Could complementary natural bioactives from plants be used to produce more advanced skin care?
The same principle could be applied to the world of cosmetics, with different bioactives targeting different aspects of skin ageing, for example,” he says. “One substance might help protect the skin from the damaging effects of ultraviolet radiation while another help regenerate skin cells. A third active could act on chronic inflammation and third anti-oxidant properties.”

“Humans have been cultivating roses since 21% since it appears to impact on more essential fatty acids such as ω-3 and ω-6 as well as micromolecules like tocopherol (Vitamin E) and phytosterol (which is a phytosterol). The cryo-extract of rose, for its part, contains as many as 20 micromolecules, including Vitamin B3, zinc (an oligo-element) and magnesium.

“Combining extracts from all the different parts of a plant (in this case, the flower and rosehip), each of which have very different but complementary bioactivity, can thus make for an advanced skincare treatment,” says Franchi. “What is more, these different extracts also address the special needs of the target zone (the skin around the eye) and show improved efficacy compared to simply one of the extracts alone. This zone is reinforced thanks to the micromolecules in two of the extracts and the anti-inflammatory properties in another (see Focus).”

“The RDG has many exceptional properties,” explains Joselynne Franchi, science coordinator for Dior Science. “These are also present in flower cryo-extracts but in a smaller amount. Calcium is important for the epidermis since it helps reinforce its barrier function. Indeed, we found that the fruit extract stimulates the genetic expression of biomarkers involved in epidermis cohesion and differentiation.

The researchers employed two techniques for extracting the different types of molecules present in the flower. The first is cryo-extraction, which extracts hydrophilic molecules at low temperatures so as to preserve their biochemical properties as much as possible. The second, dynamic enflurane, is an oil-based extraction method in which the plant is zapped with microwaves (at 1000 W power for 30 or 40 seconds) and ultrasound. The goal here is to extract the greatest number of molecules, even those that are normally inaccessible, explains Pasquier.

“We adapt our extraction method to specific parts of the plant,” she says. “For example, for the rosehip (the fruit of the rose plant, which begins to form in late spring/early summer), we need to heat the plant but not too much, since it is very sensitive to elevated temperatures. We have thus had to adjust the temperature at each stage of the process so as not to destroy the precious bioactive ingredients it contains. We called it thermo-extraction.”

“Our extraction techniques are ‘kind’ to the plant as well as the skin, and the plant and the skin,” explains Pasquier. “The RDG rosehip extract appears to inhibit the genetic expression of NFKB1, which is a transcription factor involved in inflammation, as well as that of protein pro-inflammatory markers (such as cytokines and genes involved in eicosanoid signaling, which are pro-inflammatory).”

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