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Changing the Conversation

The Role of the Microbiome in Treating AD



Skin microbes control pathogenic species, prime the immune system, and prevent inflammation and infection.

Based on the proceedings of a roundtable conversation.

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Changing the Conversation

The Role of the Microbiome in Treating AD

Skin microbes control pathogenic species, prime the immune system, and prevent inflammation and infection.

Atopical dermatitis (AD), the most common form of eczema, affects up to 25 percent of children and two to three percent of adults, according to the American Academy of Dermatology. That means one in 10 Americans will develop eczema in their lifetime. An estimated 60 percent of people with this condition develop it in their first year of life, and 90 percent develop it before age five. Symptoms such as excessively dry, itchy skin can have dramatic effects on quality of life. AD, as well as the sleepless nights it causes, affects the entire family unit. Increasingly, evidence shows that the incredibly complex and still relatively unexplored skin microbiome may have a significant influence on the pathogenesis of AD.

Unpacking the Human Microbiome

The skin microbiome has almost as many organisms as the gut microbiome and is distinct from and more diverse than the microbiome at any other anatomic site. The Human Microbiome Project, which was initiated in 2007, involved 300 volunteers at six different sites. This interdisciplinary effort consists of multiple projects spearheaded by the National Institutes of Health that aim to improve understanding of the microbial flora involved in human health and disease.

This project found that humans are comprised of more bacteria than cells. These bacteria express more than two million genes. They are generally not harmful and are essential for maintaining health.

Humans are born mostly sterile, although some

studies suggest that there are bacteria in the meconium in amniotic fluid. Still, most of the bacteria in the skin microbiome comes from mothers either during the birth process or when snuggling or feeding the baby. If the mother is experiencing dysbiosis, she may pass this on to a newborn. Although it may not be clinically apparent, this maternal dysbiosis may have long-lasting effects on the baby.

As they grow and have increased exposures, babies acquire their microbiome from the soil, the environment, and everything else they come into contact with. The human hygiene hypothesis notes that as society has become healthier and cleaner, babies are exposed to fewer and fewer germs and illnesses. There has been an increase in both autoimmune conditions and allergies that has coincided with this increased “hygiene” that may be a result of the absence of exposure to bacteria, viruses, and fungi.

TAKE NOTE...

One in 10 Americans will develop eczema in their lifetime.

An estimated 60 percent of people with this condition develop it in their first year of life.



As researchers learn more and more about the pathogenesis and etiology of atopic dermatitis (AD), they are realizing just how important the skin microbiome is when it comes to preventing or treating this common inflammatory skin condition.

Skin microbes have a critical role in maintaining skin health. They control pathogenic species, prime the immune system, and prevent inflammation and infection.

Restoring barrier function in AD-affected skin with an emollient is no longer considered sufficient. Instead, to be successful, treatment must also include optimizing bacterial populations to restore homeostasis.

This is where, why, and how La Roche-Posay products, such as the Lipikar line, rise above the fray. These products combine prebiotics and postbiotic Aqua Posae Filiformis to act on the microfloral balance without the use of antibiotics.



TAKE NOTE...

The Human Microbiome Project found that humans are comprised of more bacteria than cells. These bacteria express more than two million genes.

New Thinking on AD Pathogenesis

A growing body of evidence suggests that a diverse skin microbiome is essential for maintaining skin homeostasis and preventing or treating AD and other skin diseases.

Multiple factors contribute to variability in the skin microbiome, including host physiology and pathobiology, personal hygiene, immune system function, gender, area of the body, and age, among others.

Microbiome diversity is a sign of health. It's well known that people with AD have an abnormal and less diverse skin microbiome than their counterparts without AD. Importantly, it's not an issue of good versus bad bacteria. Instead, bacterial diversity appears to be what drives healthy skin and helps to maintain skin barrier function. There also appears to be a bi-directional relationship between the skin microbiome and skin barrier function.

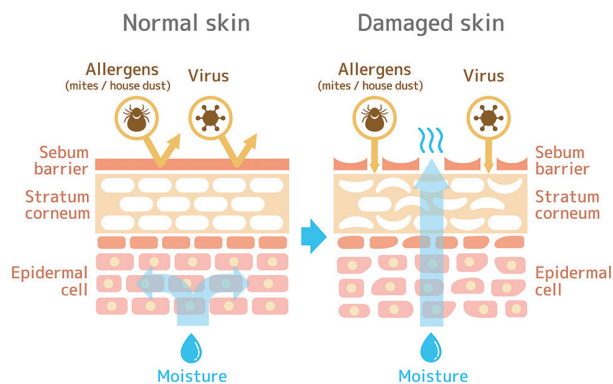


TAKE NOTE...

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The stratum corneum is a formidable barrier. Its job is to protect the body from outside factors, including viruses, fungus, and bacteria. The stratum corneum is like a brick wall, the bricks being the corneocytes and lipids being the mortar. When mortar is loose, the brick wall will wobble, shake, and fail to perform its barrier function.

When the skin barrier is not up to task, it allows allergens and bacteria to enter, and transepidermal water



In the bricks-and-mortar model of the stratum corneum, the bricks are the corneocytes and lipids are the mortar. When mortar is loose, the brick wall will fail to perform its barrier function.

loss increases. In essence, there is little control over what enters and leaves. When pathogenic microbes proliferate and allergens are let in, they change the resident population and offset the bacterial balance. The skin microbiome has an autonomous role in controlling the local inflammatory milieu, and as a result, dysbiosis sets the stage for inflammation.

Role of La Roche-Posay Skincare

Thermal spring water has been used for medicinal purposes since Roman times. The skincare brand La Roche-Posay started as a compounding facility in the town of La Roche-Posay (LRP), France. This town is known for its springs and water-based treatments for skin.

Here, treatments including high-pressure filiform showers, baths, facial, and body spray treatments, as well as La Roche-Posay thermal water consumption, take place Monday through Saturday. Led by eight dermatologists, the La Roche-Posay Thermal Center welcomes 7,500 patients every year, up to 25 percent of whom are children. Patients treated at the Center are asked to come back on a regular basis, and most stay for three weeks per session. The precise regimen consists of an 18-day treatment with a daily high-pressure filiform shower (15 bars for three minutes) using crude thermal spring water. Additionally, patients hydrate with this water.

Insurers in France currently cover these treatments for patients with AD, psoriasis, and related skin diseases. But not everyone has the time or money to visit central France for three weeks to reap these benefits. The success rate seen at this Center has inspired La Roche-Posay to formulate at-home skincare solutions that incorporate La Roche-Posay Thermal Spring Water (LRP-TSW).

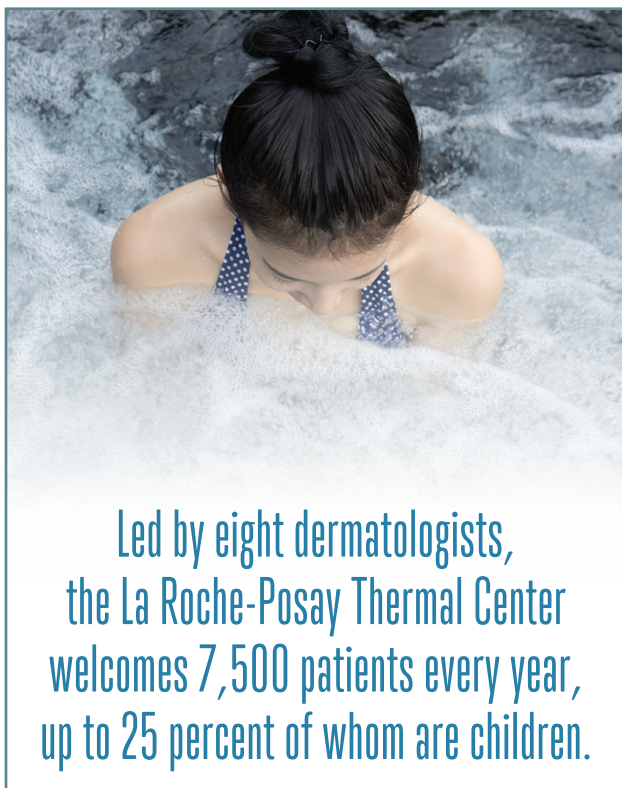
“ When pathogenic microbes proliferate and allergens are let in, they change the resident population and offset the bacterial balance. The skin microbiome has an autonomous role in controlling the local inflammatory milieu, and as a result, dysbiosis sets the stage for inflammation.”

LRP-TSW is a prebiotic, providing critical moisture to promote the healthy skin microbiome. In addition, the water contains many minerals that may have anti-inflammatory effects. This water is rich in selenium, which accounts for many of its benefits, that helps to build and maintain a diverse, protective skin microbiome.

The selenium concentration—0.53 percent—in LRP-TSW is extraordinarily high. Selenium has anti-inflammatory properties and increases glutathione peroxidase, which provides protection from the oxidative process in the skin.

Analysis of an AD Flare

There are four major phyla of bacteria on the skin: Actinobacteria, Firmicutes, Bacteroidetes, and Proteobacteria. Actinobacteria and Firmicutes are gram-positive bacteria and the distribution of these bacteria varies with skin health.



TAKENOTE...

LRP-TSW exhibits prebiotic properties due to its mineral composition and probiotic properties due to bacterial diversity.



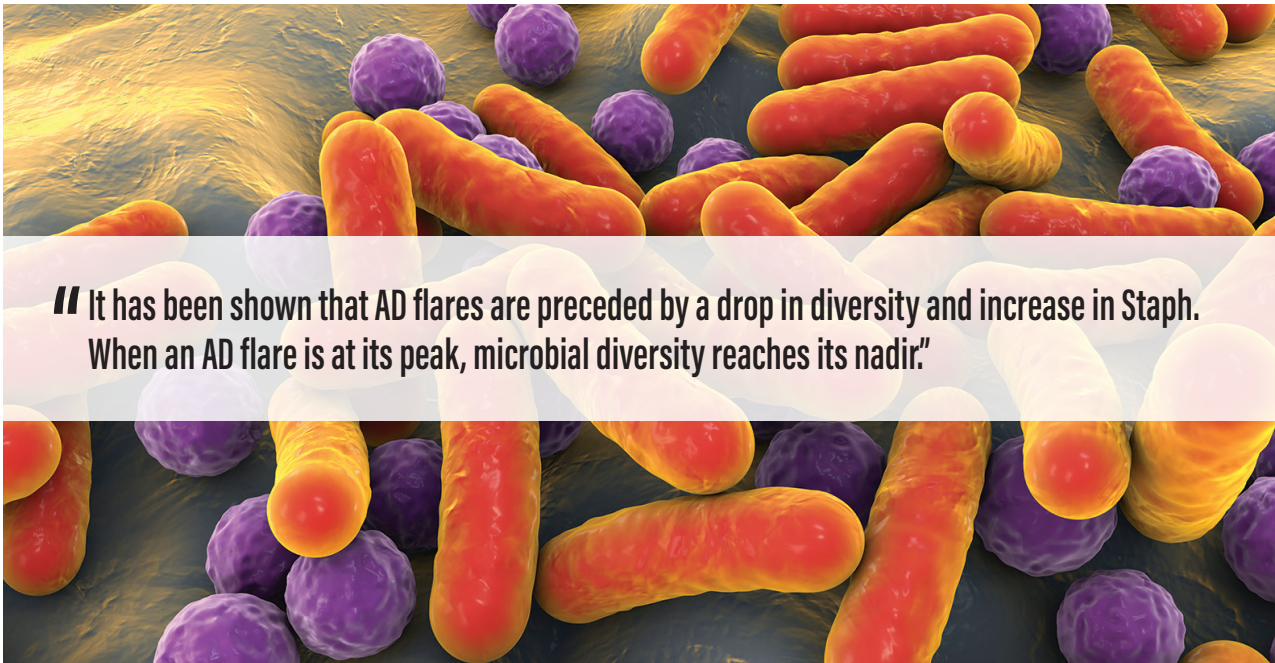
In individuals with AD, there is an abundance of firmicutes on both affected and unaffected skin, but on affected skin, Staph is more plentiful.

The severity of an AD flare correlates with decreased microbial diversity and increased Staph abundance as measured by higher SCORing Atopic Dermatitis (SCORAD) numbers.

It has been shown that AD flares are preceded by a drop in diversity and increase in Staph. When an AD flare is at its peak, microbial diversity reaches its nadir. As the flare resolves, the bacterial diversity starts to rise, Staph decreases and post-flare, the microbiome returns to baseline.

Products made with LRP-TSW have been shown to facilitate the growth of gram-negative *Xanthomonas* species which are associated with skin health. As *Xanthomonas* species increase on the skin Staph species decrease.

Prebiotics and postbiotics, such as those found in the Lipikar product line, may help optimize the microbial balance of the skin. In addition to containing the prebiotic LRP-TSW, LRP's Lipikar line contains a postbiotic made from a lysate of *Vitreoscilla filiformis*. This gram negative, filamentous bacterium is farmed on LRP-TSW, heat killed and concentrated and added to Lipikar products. It increases hydration, rebalances microbial diversity and restores the skin barrier in people with atopic eczema/dermatitis. A study of 30 atopic dermatitis patient treated with Lipikar Balm twice daily (in the absence of other therapies) for three months, showed a decrease of Staph species and an increase in *Xanthomonas*.



“ It has been shown that AD flares are preceded by a drop in diversity and increase in Staph. When an AD flare is at its peak, microbial diversity reaches its nadir.”

The growing Lipikar line now includes:

- Lipikar Wash AP+ Moisturizing Body & Face Wash. Body & Face Wash for Extra Dry Skin
- Lipikar Balm AP+ Body Moisturizer 2-Pack. Body Cream Moisturizer for Dry Skin
- Lipikar Balm AP+ Moisturizer for Dry Skin. Body Cream Moisturizer for Dry Skin

Launched in late 2020, the newest member of this family of products is Lipikar Wash AP+ Moisturizing Body & Face Wash. It is formulated with shea butter, glycerin, niacinamide and LRP-TSW. Lipikar Wash AP+ earned the National Eczema Association Seal of approval.



TAKE NOTE...

The severity of an AD flare correlates with increased Staph areas on the skin, as seen via higher SCORing Atopic Dermatitis (SCORAD) numbers.



This line's name is a nod to its ingredients and benefits. Lipikar means lipid care. Lipikar is formulated with lipids, such as shea butter, and moisturizing ingredients, such as glycerin.

Lipikar Use Promotes Antimicrobial Stewardship

Use of Lipikar AP Balm has been shown to reverse the dysbiosis seen in AD without the use of antibiotics or steroids. The overuse of antibiotics contributes to antibiotic resistance and the development of superbugs while topical steroids have numerous well-known detrimental effects.

The narrative around factors that contribute to AD has shifted in the past decade in concert with research that highlights the role of microbiota homeostasis in the pre-

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vention and treatment of this inflammatory skin disease. La Roche-Posay's Lipikar line is uniquely suited to restore and maintain a healthy skin microbiome. ■

