



Rethinking skin probiotics: Replenishing lost skin commensals could be key to keeping skin looking younger, longer

Thomas M. Hitchcock, Ph.D.

Chief Science Officer at Crown Laboratories, Inc. and
Adjunct Professor – Department of Biomedical Sciences at
ETSU James H. Quillen College of Medicine

Anyone who has their eye on the skincare market can tell you that the terms “microbiome” and “probiotic” have not only entered the common skincare vernacular, but are expected from most consumer brands.

However, the term “probiotic” is one in which there is disagreement as to the actual meaning. Class action lawsuits have even been filed over the use of this term. While some companies use it to refer to ferment or lysates of “healthy” microbes, most agree that the defined term refers to products that, *at the very least*, actually contain living or dormant (but still living) microbes that impart some health benefit to the skin.

Of course, this presents some logistical challenges on how to best formulate probiotics into skincare. This is a challenge that most companies have tried to bypass by adopting a more ambiguous meaning to the term “probiotic,” while others, namely Crown Laboratories, have stepped up and are working to help define the category by creating legitimate, and skin-relevant, probiotic topicals.

In a 2015 publication titled “Selective manipulation of the gut microbiota improves immune status in vertebrates¹,” the authors describe what most researchers in the field consider five required characteristics for a microbe to be classified a true probiotic. The authors state that a probiotic must:

- *Have the capacity to survive in the relevant area of the body*
- *Display high resistance to stressors specific to that location*
- *Lack any transferable antibiotic resistance gene*
- *Be able to confer clear benefits through modulation of the resident microbiome*
- *Be non-pathogenic, non-toxic, and provide protection against disease-causing microorganisms*

The definition in this publication sets the bar higher than just any living microbe that can exhibit some health benefit. Now, it must be able to actually live and even engraft on that skin. This limits the viable candidates for a true skin probiotic to the list of healthy strains (i.e., commensals and symbionts) that exist on the skin already.

Two of the most prevalent, and arguably most important, skin microbial species are *Cutibacterium acnes* (*C. acnes*) and *Staphylococcus epidermidis* (*S. epidermidis*). The balance between these two skin microbes is critical for keeping the skin healthy and free from other more pathogenic microbes, with *C. acnes* ruling the depths of the skin and hair follicles, and *S. epidermidis* watching over the surface of our skin, along with some support from *C. acnes* (which basically goes where skin oils go). These two microbes are known for taking the secretions of the sweat and oil glands, turning them into skin-healthy substances like short chain fatty acids (i.e., propionic acid and butyric acid), and producing targeted antimicrobials against pathogens. Additionally, protective strains of *C. acnes* subspecies *defendens* make copious amounts of antioxidants that help protect the skin against free radical and oxidative damage from our own metabolism, as well as the environment. There is an abundance of recent scientific findings that point to the need for protective strains of these two skin commensals/symbiotes.

However, there are many strains of each of these two species of microbes, many protective but some potentially pathogenic, all of which are competing for the same niche. Also, as we age, the amounts of these two skin symbiotes start to diminish, along with all the benefits they confer. So, protective strains such as those found in *C. acnes defendens* would very much fit the robust description of what a true probiotic would be. They would help to outcompete more deleterious strains and species, would be able to engraft on the skin, and confer a host of benefits to the skin to help keep it healthy and more youthful for a longer period of time.

While that is great in theory, does it translate into reality? If the outputs we have seen during our clinical studies, where we have applied a protective strain of *C. acnes defendens* to facial skin on a daily basis, are any indication...the answer is a definitive yes. Look for more details on this soon!

Do you want to see data supporting this? If you want to be one of the first, visit crownlaboratories.com/microbiome for more information on our research.

Any questions or comments?

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 tmhitchcock

¹ Montalbán-Arques A, De Schryver P, Bossier P, Gorkiewicz G, Mulero V, Gatlin DM III and Galindo-Villegas J (2015). Selective manipulation of the gut microbiota improves immune status in vertebrates. *Front. Immunol.* 6:512. doi: 10.3389/fimmu.2015.00512.