

ABSTRACT

PRESENTER: Dr. Nicholas Monsul

COMPANY: Quorum Innovations LLC

JOB TITLE: Co-Founder

Podium Title: *Biofilm Phenotype and the Functional Microbiome for Healthy Skin*

Background information (Short introduction)

Representing the most successful form of microbial life present in our environment, including our bodies, biofilms are everywhere. Biofilms consist of microbial communities attached to a surface, such as human skin, embedded in a biological matrix of their own making. It is as biofilms that microbial organisms hardily colonize the skin surface, constituting the Functional Microbiome. This way of life contrasts starkly with planktonic microbes, which exist individually in a liquid medium.

Objective

Commensal microbes grown in the biofilm phenotype behave differently than planktonic or free-floating microbes functioning individually. These commensal biofilms are an optimal discovery source for microbiome-based skin cosmetic solutions. Biofilm-based actives can be utilized for their differentiated effects on the human body functionally when compared to planktonic derivatives. This research will explore such differences observed between biofilm and planktonic-based ingredient solutions.

Methodology

Current studies have found that the biofilm phenotype effectively modulates resident skin microbiota and host skin responses. A Lactobacillus human microbiota biofilm-based fraction will be used to illustrate improved skin eubiosis and support for normal skin barrier function. In vitro assay and ex vivo studies will be utilized to illustrate this performance by the biofilm-based substance.

Results

The commensal biofilm phenotype-based solution provided results consistent with improved skin barrier protection and healthy skin. This is manifest through results showing enhanced response from transcription factors that help regulate gene expression relevant to the appearance of healthy skin. Up-regulation of other relevant features of skin, including human skin beta defensin levels, as well as improved protection from stressors such as reactive oxygen species were also observed.

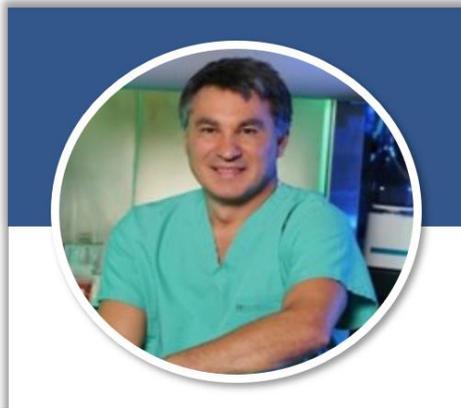
Conclusion

The application of the commensal biofilm phenotype enables the discovery of new technologies for skin barrier protection and healthy skin. As suggested by the results of this study, this

approach could provide a novel means through which to address challenging dermatological conditions as well as to improve the perceived condition of skin in cosmetic applications.

Why is this important to the industry?

Of late, the study of human microbiota has exploded. Despite this, very little consideration has been given to the implication of the overwhelmingly biofilm “lifestyle” of human microbiota, particularly commensals. Microbiome “big data” is analyzed without regard to planktonic or biofilm considerations, and in general, the study of human microbiota as biofilms remains limited. This study can help elucidate some differentiating aspects that biofilms could offer for future microbiome research.



Dr. Monsul is CEO and co-founder of Quorum Innovations, a microbiome therapeutics discovery company in Sarasota, FL. He was recently awarded his 10th patent from the USPTO in the field of microbiome therapeutics and has lectured internationally and nationally at major microbiome conferences on the topic of commensal biofilms, skin barrier health and the functional microbiome. Dr. Monsul graduated from Drexel University and completed surgical training at Yale University School of Medicine and The Johns Hopkins Hospital, where he later remained on faculty. His focus is on the translation of human microbiome research into

clinically relevant technologies.