

ABSTRACT

PRESENTER: Dr. Paul Lawrence

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JOB TITLE: Director of Bioscience Research and Product Development at

Podium Title: *Small Non-coding RNAs: An Epigenetic Toggle Switch for Gene Expression*

Abstract

Epigenetics is a blanket term covering alterations in gene expression that occur without changes to the DNA sequence of genes. Mechanisms include methylation of genomic DNA, formation of DNA quadruplexes, and oscillating states of histone protein acetylation. Short, non-coding RNA molecules offer a fourth, post-transcriptional epigenetic process collectively called "RNA interference" or "RNAi". Short-interfering RNAs (siRNAs) and microRNAs (miRNAs) represent the two classes of RNAi effectors, which are distinguished by subtle differences and similarities. Currently, both the cosmetic and pharmaceutical industries are pursuing methods to harness the power of this epigenetic mechanism to remedy a variety of conditions and diseases. With respect to skin care, the topical application of these tiny RNA regulators has considerable potential, but technical hurdles remain that need to be surmounted prior to large scale commercialization. An overview of epigenetics will be provided followed by a discussion of the specific instances where RNAi can be utilized to improve skin health as well as the challenges that must be addressed to bring RNAi-based skin care products to the market.



Dr. Lawrence received his doctorate in molecular microbiology from Stony Brook University and before that obtained his Bachelor of Science degree in molecular biology from the University of New Mexico. During his career, he has conducted biological research in academia, industry, and for the United States government. He has conducted vaccine and anti-viral therapeutic research at Brookhaven National Laboratory and at the Plum Island Animal Disease Center. In industry, he has participated in contract biopharmaceutical research and development for the former Collaborative Bioalliance and Dow Chemical. Dr.

Lawrence was also the Director of DNA Production for the anti-counterfeiting biotechnology company, Applied DNA Sciences. Currently, he is the Director of Bioscience Research and Product Development for Biocogent. Over the course of his career, Dr. Lawrence has published more than 20 research manuscripts and review articles, more than 25 online science digests, as

well as a textbook chapter on the molecular pathogenesis of the one of the world's most infectious viruses.