

## CDR SEMINAR SERIES

# Hilton Kaplan, MBBCh, FCSSA, PhD

Rutgers, The State University of New Jersey

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## “Enhanced Vitamin Penetration - the Holy Grail in Non-Invasive Facial & Body Rejuvenation”



### BIOGRAPHY:

Hilton Kaplan is a Plastic Surgeon and Biomedical Engineer with research interests in neurosciences (focusing on neural prosthetics and other implantable man-machine interfaces), and tissue engineering (particularly decellularized composite allotransplantation of limbs and faces). He has held various clinical and research positions in industry, including Senior Medical Director at Allergan (a Fortune 500 healthcare company) and Vice President of Clinical Sciences at LifeCell Corporation (the industry-leading pioneer of decellularized dermal tissues for regenerative medicine). Dr Kaplan has been an Adjunct Professor in Regulatory Science at the University of Southern California, and is a founding board member of the Grossman Burn Foundation.

### ABSTRACT:

Over two decades ago the importance of Vitamin A and cosmeceutics was pioneered by the likes of Kligman and Fernandes. Today high dose topical anti-oxidant Vitamins A and C are widely recognized for their significant rejuvenating / anti-ageing aesthetic properties, as well as important anti-dysplastic benefits (in the case of Vitamin A). The focus of researchers in the field has now progressed to methods of enhancing penetration of vitamin skin therapies into the skin. We present advances in the field that can improve transcutaneous penetration of large-molecule vitamins up to 10,000 fold through non-invasive treatments.

The conventional acid and alcohol forms of vitamins (retinoic acid, retinol; ascorbic acid) cause stripping and photosensitivity of the skin. They are also water soluble and so are more poorly absorbed through the skin; and what does get in largely gets carried away by the dermal blood stream. Furthermore, the portion that remains and does enter the keratinocytes cannot be converted into the normal storage ester forms. Fat or fat-converted forms of Vitamins A & C however, are truly fat soluble to achieve optimum penetration through the skin's lipid barrier with minimal topical side effects. Once within the water-based cytoplasm, these forms are readily converted into the active water-soluble retinol, retinoic acid and ascorbic acid forms as needed, by the esterase enzyme system - part of the skin's normal vitamin metabolism. The remainder is stored in the cell. This process minimizes side-effects at the surface of the skin while maximizing bioavailability in the cytoplasm and nucleus.

Techniques that further augment absorption of these forms of vitamins are discussed, including ultrasound at optimized frequencies; pulsed-iontophoresis; transdermal patches; and micro-needling to bypass the stratum corneum without stripping it.

**LOCATION:** Life Sciences Building Rutgers - The State University of New Jersey,  
145 Bevier Road, Piscataway, New Jersey 08854, New Jersey Center for  
Biomaterials Suite - Conference Room 102

**TIME:** 5:30 PM

**HOST:** Bozena B. Michniak-Kohn, Ph.D., M.R.Pharm.S. Director, Center for  
Dermal Research, Professor of Pharmaceutics, Ernest Mario School of  
Pharmacy