

*Neuroscience Center of Excellence*

# Dean's Award Lecture

*in Neuroscience and Ophthalmology*

## **Sex-Specific and Dietary Regulation of Intrinsic Protective Lipid Circuits**

Inflammation, a frequent and self-resolving response, is essential for protection and integrity of tissues and is intimately linked to wound healing. Healthy execution of inflammatory/reparative responses requires activation of conserved resolution programs. Distinct classes of lipoxygenase (LOX)-derived eicosanoids and their  $\omega$ -3 PUFA homologs establish a tone of anti-inflammatory signals, are early response signals to injury or infection and key regulators of resolution and healing. Our research efforts are focused on elucidating function and regulation of these protective lipid circuits in the eye. We have discovered intrinsic lipid circuits in the cornea and retina that control inflammation, leukocyte function, wound healing and angiogenesis. Our studies have demonstrated that protective actions of dietary  $\omega$ -3 PUFA are mediated by generating specific docosahexaenoic acid-derived autacoids. Sex-specific differences in ocular inflammatory/reparative responses and estrogen's role in ocular diseases are not well understood, especially in Dry Eye Syndrome, a disease with striking prevalence in women. Ongoing work has uncovered that estrogen receptors regulate corneal protective lipid circuits, which correlates with estrogen-driven and sex-specific differences in wound healing, inflammation and corneal pathology of Dry Eye. The lecture will present our current understanding of intrinsic lipid circuits and their potential role in the pathogenesis of ocular inflammatory diseases.



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**8th Floor**  
**Neuroscience Center**  
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**Conference Room**

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