



## **Visionary Seminar Series at USC**

**Monday, October 2, 2017 at 3:30PM**

**Ray R Irani Hall Conference Room 101**

*(Simultaneous Webcast to Herklotz Seminar Room, Zilkha Neurogenetic Institute)*



**Grazyna Marta Palczewska, PhD**

**Medical Device Director  
Polgenix, Inc.**

**“Two-Photon Ophthalmoscopy  
with Low Laser Power”**

Detection of the earliest changes in the function of the visual system *in vivo* is critical for identifying the sequence of events underlying age- and disease-related retinal pathologies, understanding the causal mechanisms of such pathologies and developing effective therapies for their prevention and/or treatment. A novel instrument, the "2-photon ophthalmoscope" or "2PO", has the capability for non-invasive evaluation of the retina and its function *in vivo*. Light wavelengths needed to excite endogenous fluorophores that participate in metabolic processes in the retina are highly attenuated by the anterior segment of the human eye. 2-photon excitation imaging with pulsed infra-red (IR) light overcomes this obstacle. We previously demonstrated that 2-photon excitation-based imaging can reveal the sequence of cellular events leading to light-induced retinal degeneration, and provide evidence about the protective impact of treatments with investigational pharmaceuticals. However, to apply 2PO safely to noninvasive imaging of the human retina, the laser power necessary for revealing informative structures within the retina needs to be reduced. Low laser exposure, noninvasive adaptive optics 2PO imaging of the retina *in vivo*, can be realized with the application of ultra-short laser pulses coupled with high order dispersion compensation. Furthermore, this approach can be used to evaluate the impact of variable pulse durations on imaging models of different retinal pathologies.

Host: Provost Professor Scott Fraser  
Jointly Presented with Zilkha Neurogenetic Institute  
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