

## **ESCRS 2008**

### **Refractive Surgery New Techniques/Complications - 6 Minutes**

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Venue: Hall 14/2

#### **Solid State Laser in ophthalmology**



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**Purpose:** To address practicality and safety of Solid State Laser (213nm) in refractive surgery.

**SETTING:** University of Western Australia, School of Animal Biology; Institution of Vision and Optics, University of Crete; Research and Development, CustomVis, Australia.

**METHODS:** Comparisons between ablation characteristics, DNA damage, amount of apoptosis, live cell proliferation and endothelial cell counts in post-lasered corneas with solid state and excimer were done. Cytotoxicity, mutagenicity and free radical production of 213nm in comparison to 193nm and 266nm were studied. Absorption characteristics of 213nm and 193nm in Balanced Salt Solution (BSS) and Sodium Chloride (NaCl) were studied.

**RESULTS:** Ablation characteristics, DNA damage, Cytotoxicity, Mutagenicity and Free radical production were similar in 213nm and 193nm lasered corneas. Highly significant differences in Sparsely Labelled Epithelial Cells and Keratocytes were found in corneas lasered with 266nm. Endothelial cell counts were similar after 12 months following laser refractive surgery in human corneas with 213nm and 193nm. Apoptosis was similar but there was a significant number of live cells found following 193nm ablation, suggesting more inflammation with 193nm. The absorption coefficients in BSS and NaCl were much lower for 213nm than 193nm.

**CONCLUSIONS:** Histological characteristics showed great similarity between 213nm and 193nm. 213nm proved to be more effective as it produced less inflammation and has low absorption coefficients in BSS and NaCl. Financial Disclosure: 3