Blocking myofibroblast differentiation with an anti-TGFβ antibody decreases the induction of higher-order aberrations after photorefractive keratectomy (PRK) in a cat model

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Objective

- **Wound healing** can compromise the outcome of surface ablation procedures (PRK)
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- **TGFβ** (Transforming Growth Factor β) plays a pivotal role in corneal wound healing (esp. transformation of keratocytes into myofibroblasts)
Objective

• Wound healing effects can compromise the outcome of surface ablation procedures (PRK)
• TGFβ (Transforming Growth Factor β) plays a pivotal role in corneal wound healing (myofibroblast transformation)

• **Hypothesis**: “Contractile myofibroblasts contribute to induction of higher order optical aberrations after PRK”
**Methods: PRK in cats**

- **8 eyes** from 5 domestic shorthair cats (*felis cattus*) underwent **PRK for myopia** (Planoscan, B & L) -10 D, 6mm OZ

  - **treatment eye:** anti-TGFβ (1mg/mL b.i.d.)
  - **control eye:** **vehicle solution** b.i.d.

  - for 7 days

- **follow-up exams:** 2, 4, 8 and 12 weeks
Methods: aberrometry in awake-behaving cats

• **wavefront sensing** *(H/S sensor - 300µm lenslet spacing)* in fixating cats
• **Zernike decomposition** *(10\text{th} order)*
  – LOA RMS, coma RMS, SA RMS, residual RMS
  – VSOTF

Nagy, MacRae, Yoon, Cox, Huxlin, J Cat Refr Surg 2007; 33: 1051-1064
Bühren, Yoon, Kenner, MacRae, Huxlin, IOVS 2007; 48: 5806 – 5814
Results: wavefront I (LOA)

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<th>treatments</th>
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LOA: no differences
Results: wavefront II (HOA)

- **coma RMS [µm]**
  - C
  - C
  - C

- **spherical RMS [µm]**
  - C
  - C

- **residual HOA RMS [µm]**
  - C
  - C

Legend:
- treatments
- controls
Results: wavefront II (HOA)

TGF treatment group:
- less coma, SA and other HOA
- better retinal image quality
- less fluctuation
Conclusion

Pharmacological wound healing modulation can affect wavefront aberrations after PRK
Thank you!