

## Hydrophilic Acrylic IOL as a Drug Delivery System for the fourth Generation Fluoroquinolones

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## Financial Disclosure

- Nulens
- Hanita Lenses Ltd
- Visioncare
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- Rayner

## Background

- Gradual increase of postoperative endophthalmitis (POE) in the USA since 1992.
  - unsutured clear corneal incision
  - bacterial adhesion to IOLs
- Most cases of POE are being attributed to the external surface flora.
- Preventive antibiotic treatment, although till recently not proven directly to be effective, is very popular.

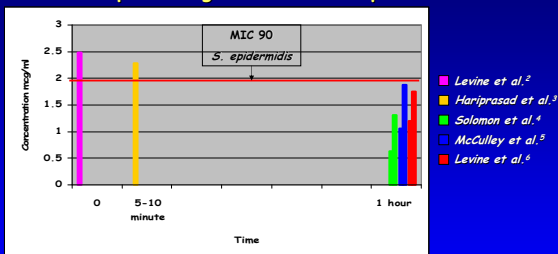
## Background

- Significant increase in resistance to Ciprofloxacin (37%)<sup>1</sup>.
- Topical protocols of the fourth generation fluoroquinolones did not succeed in reaching the MIC90 for *S. epidermidis* in the anterior chamber for more than few minutes after the application.

1. Recchia FM, et al. Archives Ophthalmol. 2005;123:341-346.

## Background

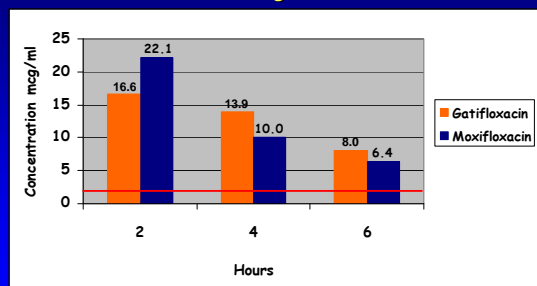
### Topical 4<sup>th</sup> generation fluoroquinolones



- Levine JM, et al. J Ocul Pharmacol Ther. 2004;20:210-6.
- Hariprasad SM, et al. Arch Ophthalmol. 2005;123:39-44.
- Solomon R, et al. Ophthalmology. 2005;112:466-469.
- McCulley JP, et al. Presented at the AAO annual meeting New Orleans October 2004
- Levine JM, et al. J Cataract Refract Surg. 2004;30:2177-2182.

## C Flex as DDS - Pilot Study

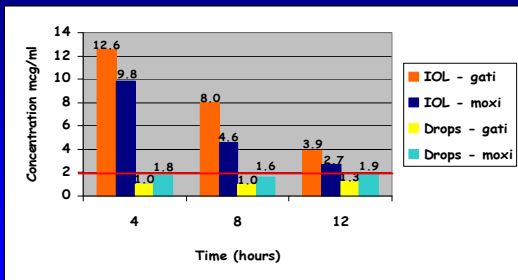
### 24 hrs soaking time



Kleinmann G, et al. JCRS 2006;32(4):652-4.

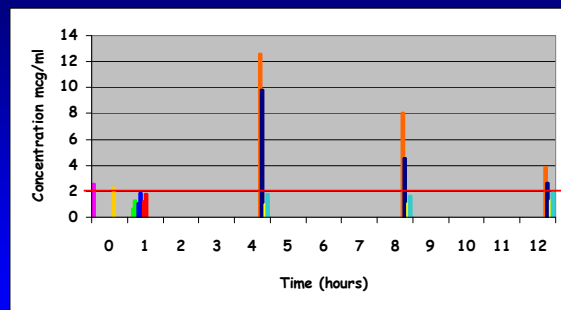
## C Flex as DDS - Full Study

24 hrs soaking time



Kleinmann G. et al. JCRS 2006; 32(10):1717-21.

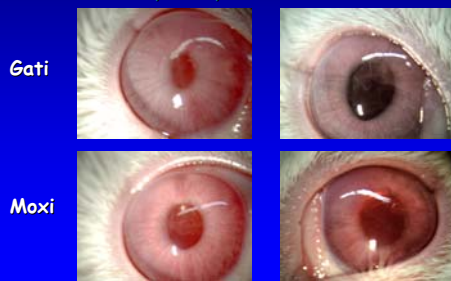
## Comparison to topical drops



## Results - Full Study

No clinical sign of toxicity after 24 hrs

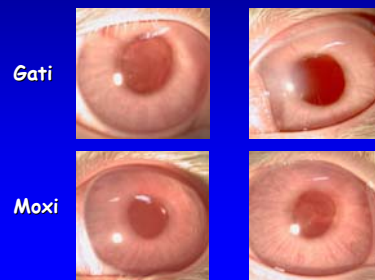
Group A - presoaked IOL



## Results - Full Study

No clinical sign of toxicity after 24 hrs

Group B - "regular" IOL + drops

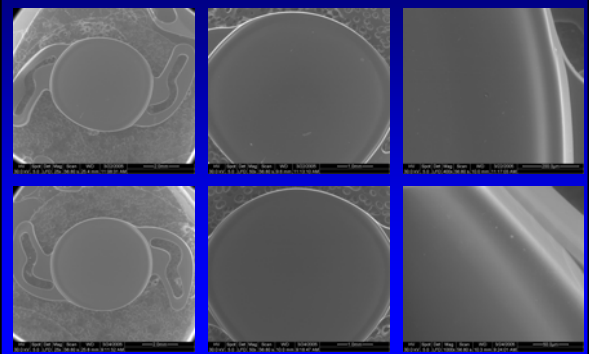


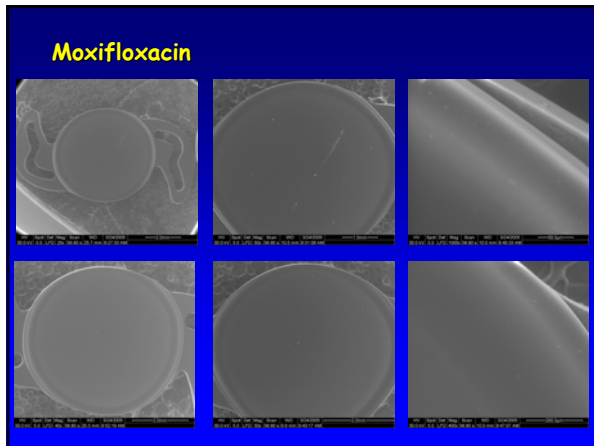
## Safety for the IOL

- > 4 IOLs were placed in the Abs solutions (2 - Zymar, 2 - Vigamox) for 5 weeks.
- > SEM analysis of the IOLs

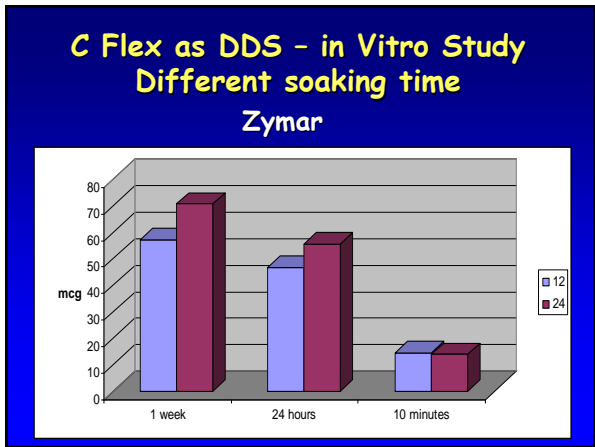
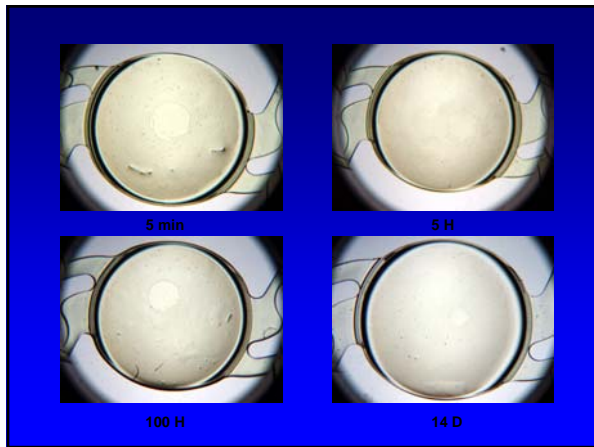


## Gatifloxacin



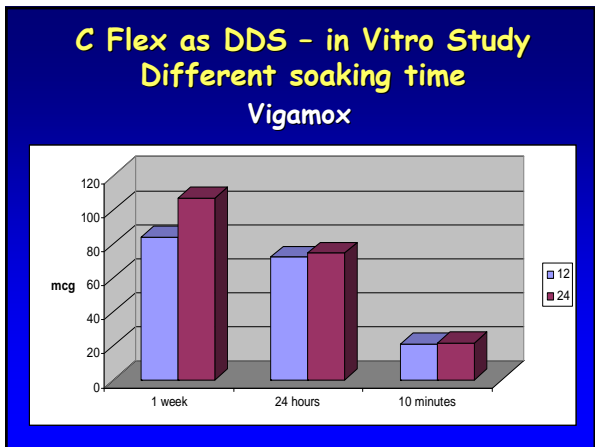


After 5 weeks soaking in Vigamox IOLs became yellow



**Zymar**

	Week	24 hours	10 minutes
12 h	57.15±3.5 (123%)	46.53±2.0	14.4±2.3 (31%)
24 h	70.65±5.14 (127%)	55.57±1.0	13.82±2.27 (25%)



## Vigamox

	Week	24 hours	10 minutes
12 h	84.95±2.05 (117%)	72.05±7.06	20.94±2.76 (29%)
24 h	106.94±2.85 (182%)	74.57±25.0	21.65±3.1 (29%)

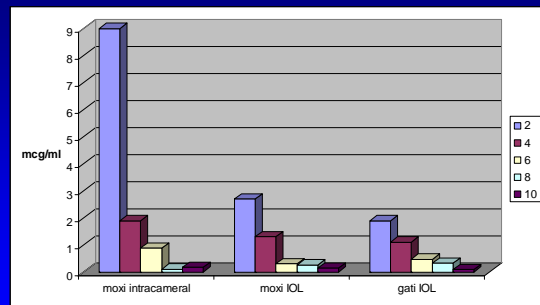
- Longer soaking time (1 week):
  - Mild increase in the amount of the Ab that was released into the solution
  - Longer release time, mainly with Vigamox
- Shorter soaking time (10 minutes):
  - Release of ~30% of the amount of the antibiotic into the solution.

3 subgroups:

15 minutes soaking time in Vigamox

15 minutes soaking time in Zymar

Intracameral injection of Vigamox (100mcg/0.1cc)



## Acknowledgments

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Thank you for your  
attention

