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EYESHADOW-POLYMER INTERACTION IN SOFT CONTACT LENSES

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Winner of the 2017 CooperVision Force award, which recognizes well conducted novel research by undergraduate students

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Reason why:

- *bacterial infections,*
- *ocular surface and tear film instability,*
- *conjunctival pigmentation,*
- *cosmetic contaminants suspended in tear film*

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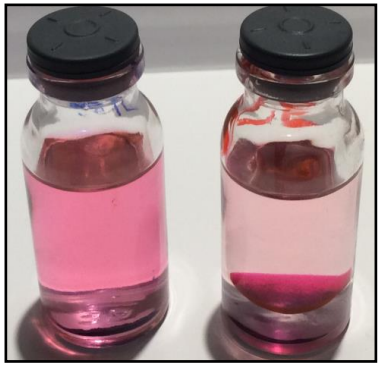
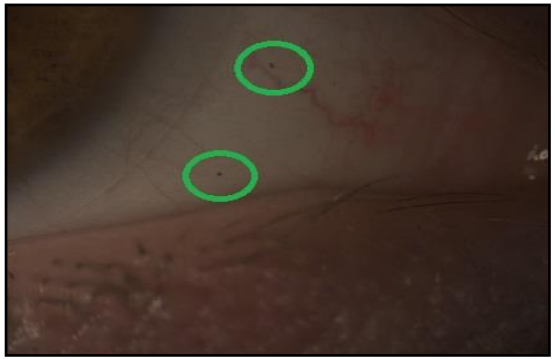
Reason why:

In vitro

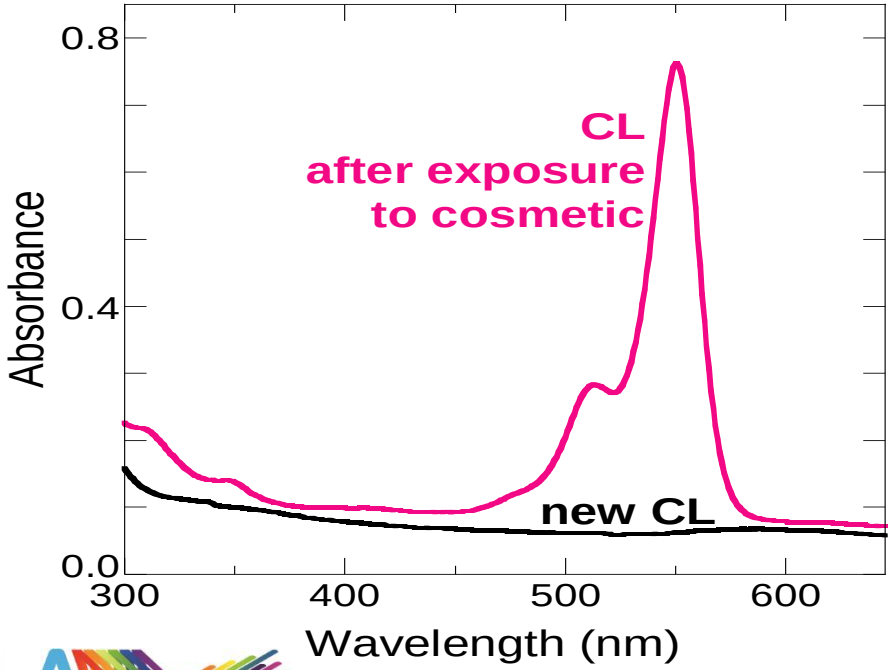


In vivo



In vitro analyses:

CL absorbance spectra before and after exposure purple powder eyeshadow, dissolved in 0.9% NaCl (cosmetic solution 1 mg/mL).



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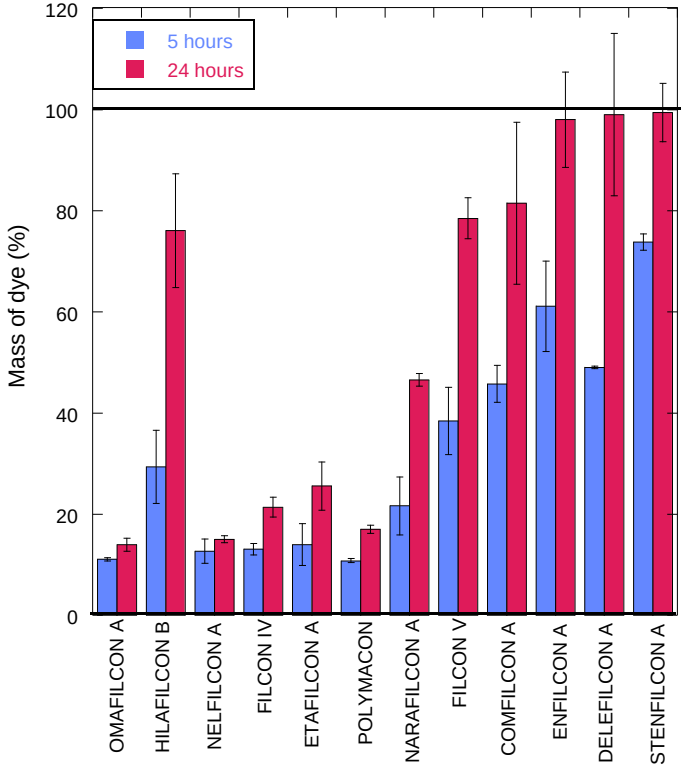

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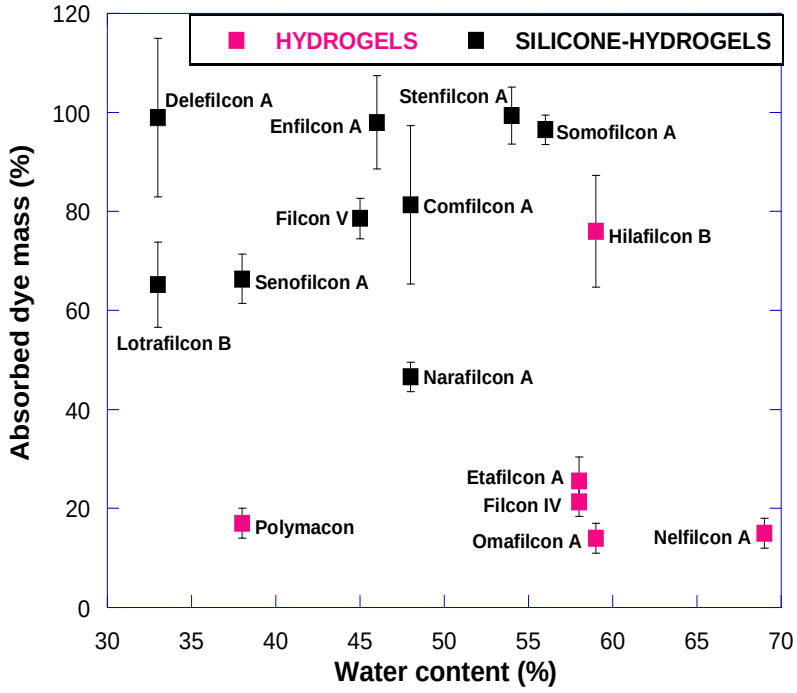
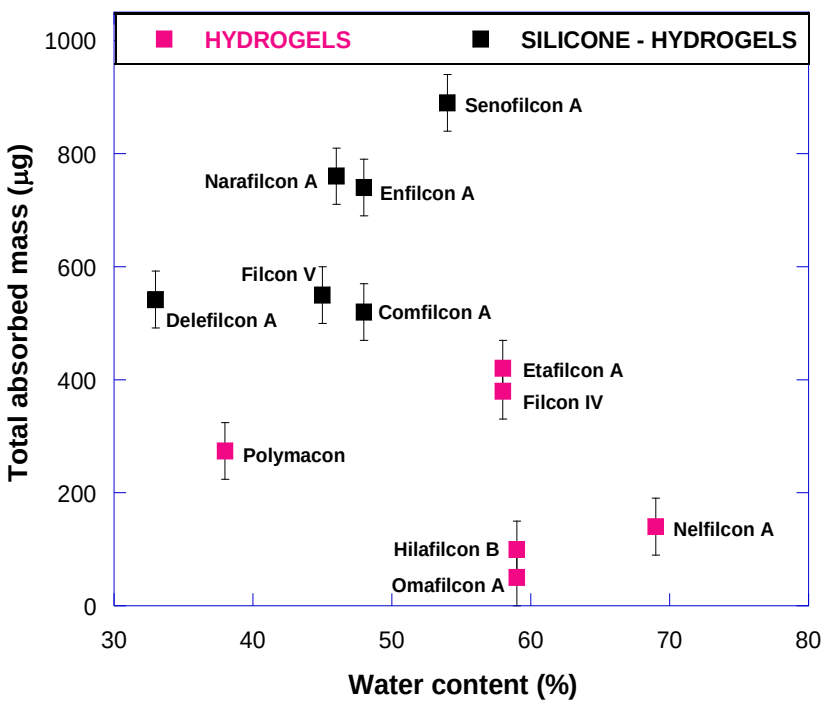
In vitro analyses:





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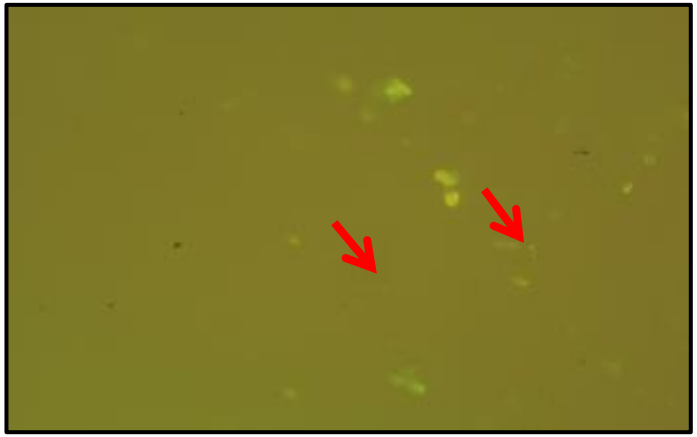
Imaging by fluorescence microscopy of worn CLs: surface aggregate

Delefilcon A daily CL, worn for 8 hours with eyeshadow



Filcon V monthly CL, worn for 7 days with eyeshadow (multipurpose over night)

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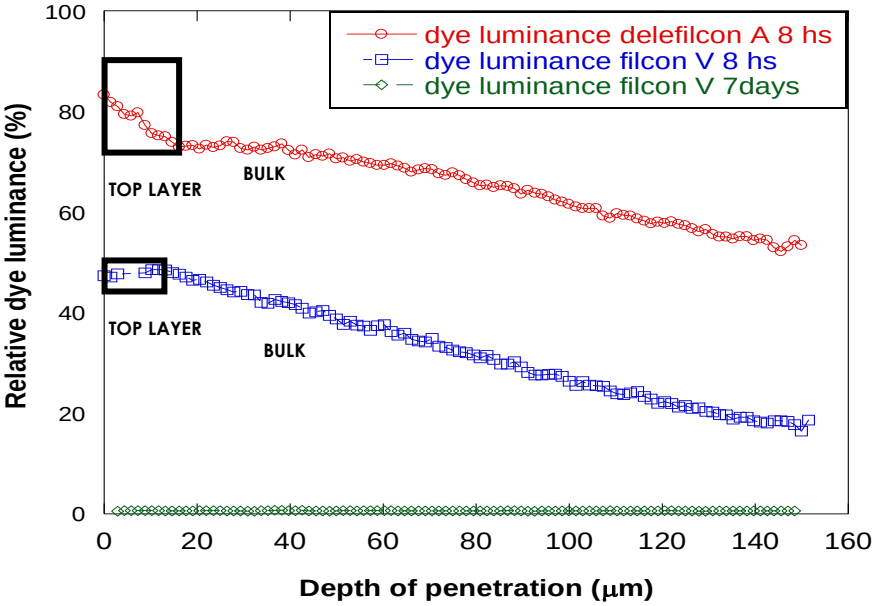
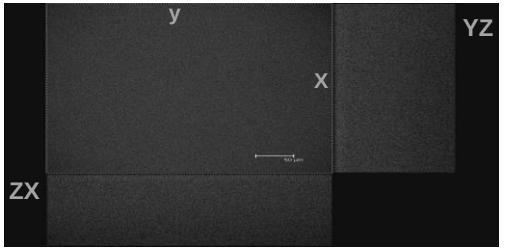
Imaging by confocal fluorescence microscopy of worn CLs:

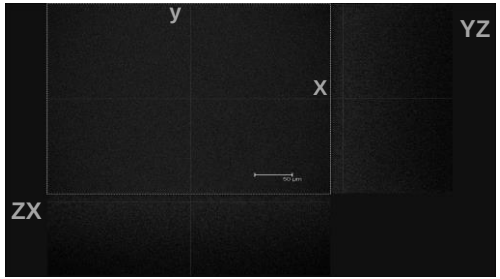
Eyeshadow penetration depth in Silicone-hydrogel CLs:



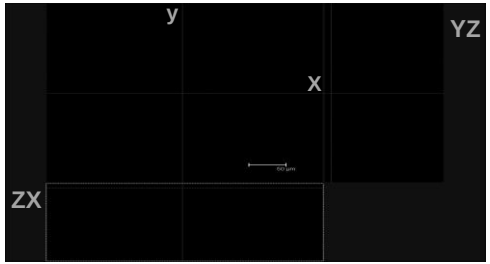
Leica SP2: SCAN OF 158 PARALLEL PLANES



Delefilcon A worn 8 hs with eyeshadow



Filcon V worn 8 hs with eyeshadow



Filcon V worn 7 days with eyeshadow + mps solution

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Conclusions:

- In vitro analysis:
  - silicone-hydrogel CLs are found to be more contaminated by the eyeshadow than hydrogel CLs (except hilafilcon A)

EYESHADOW	SILICONE-HYDROGEL	HYDROGEL	STATISTIC
Dye diffusion (mean value)	84% ± 20%	19% ± 5%	($p < 0.001$)
Total absorbed mass (mean value)	667µg ± 151µg	253µg ± 157µg	($p = 0.002$)

- The CLs worn with eyeshadow show contamination:
  - on the surface
  - in the entire thickness of CLs

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