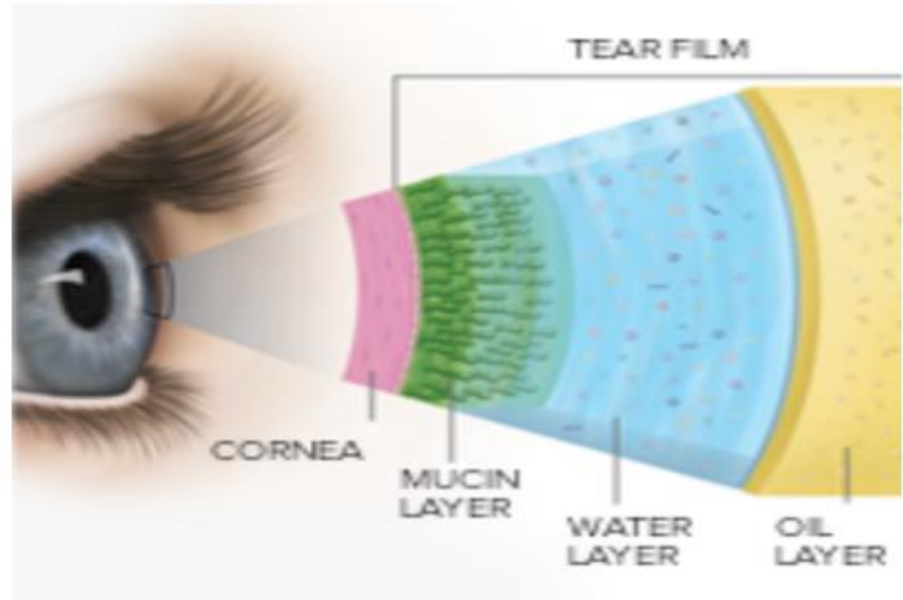


Investigating the Effects of pH on Hydrogel Friction

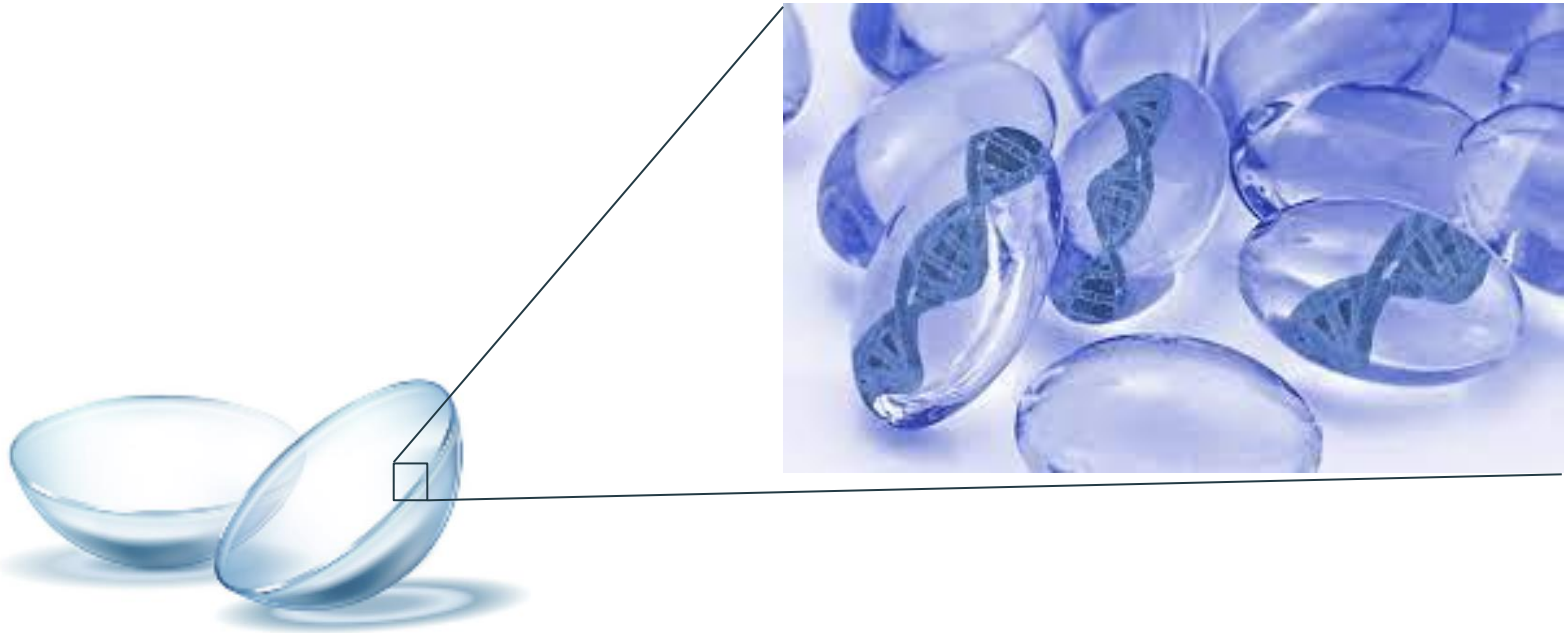
Rachel Lee, Conor Pugsley, and Ruby Cossio-Hernandez
Allison Chau
Dr. Angela Pitenis
Materials Department
University of California, Santa Barbara

Contacts disrupt low-friction biological environments

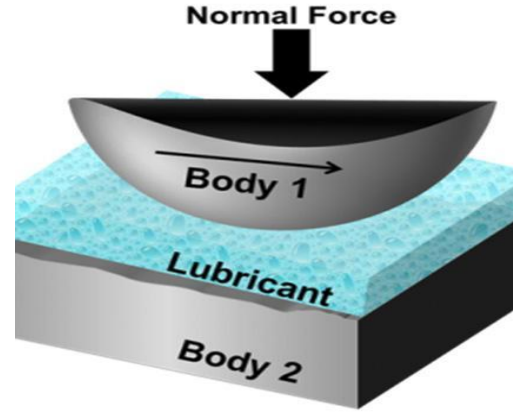
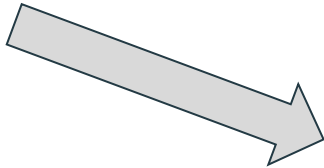
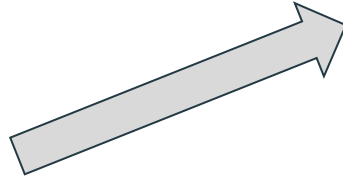
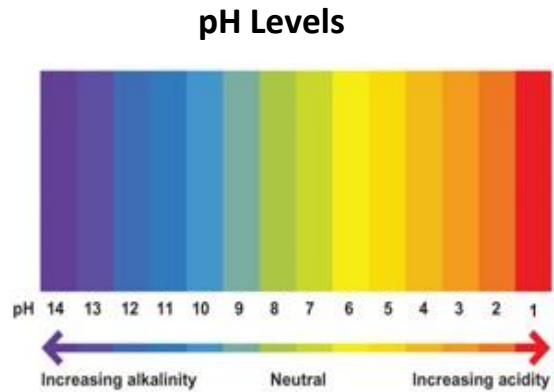
Ocular tear film



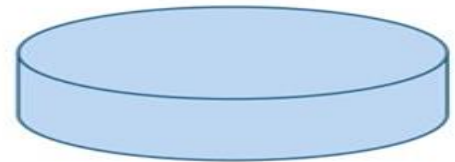
Synthetic hydrogels can replicate low-friction interfaces



pH levels can tune the friction and swelling of hydrogels



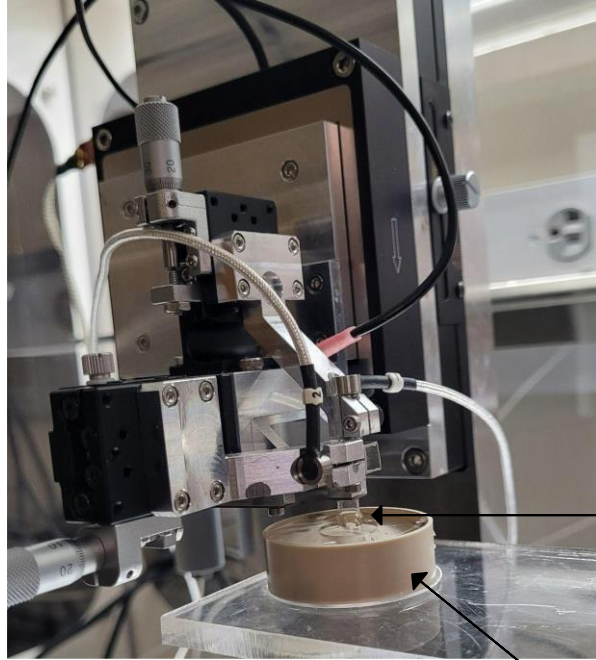
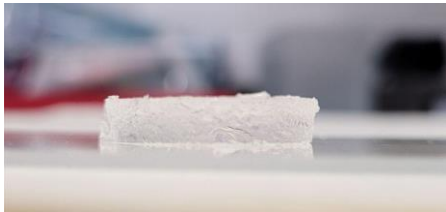
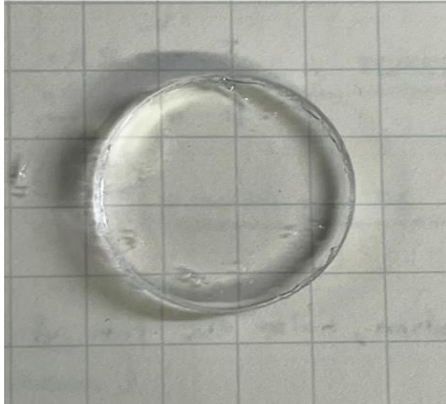
fully
swollen



fully
dried



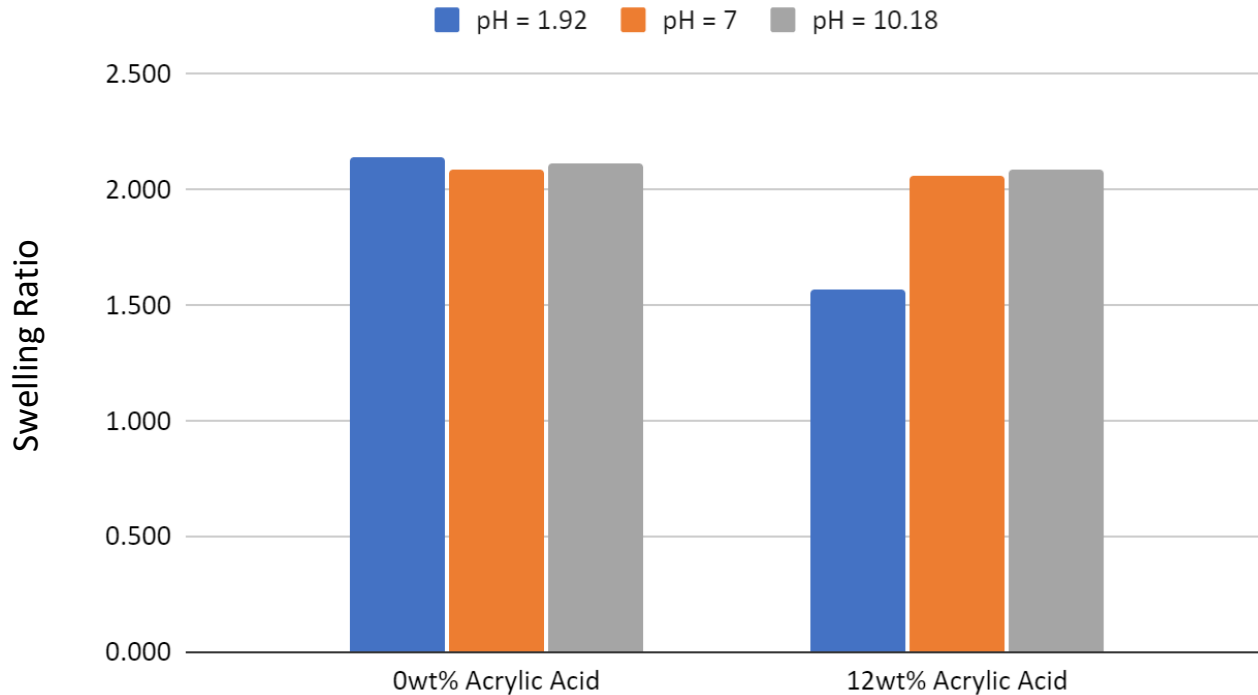
Acrylic acid enables pH to affect these properties



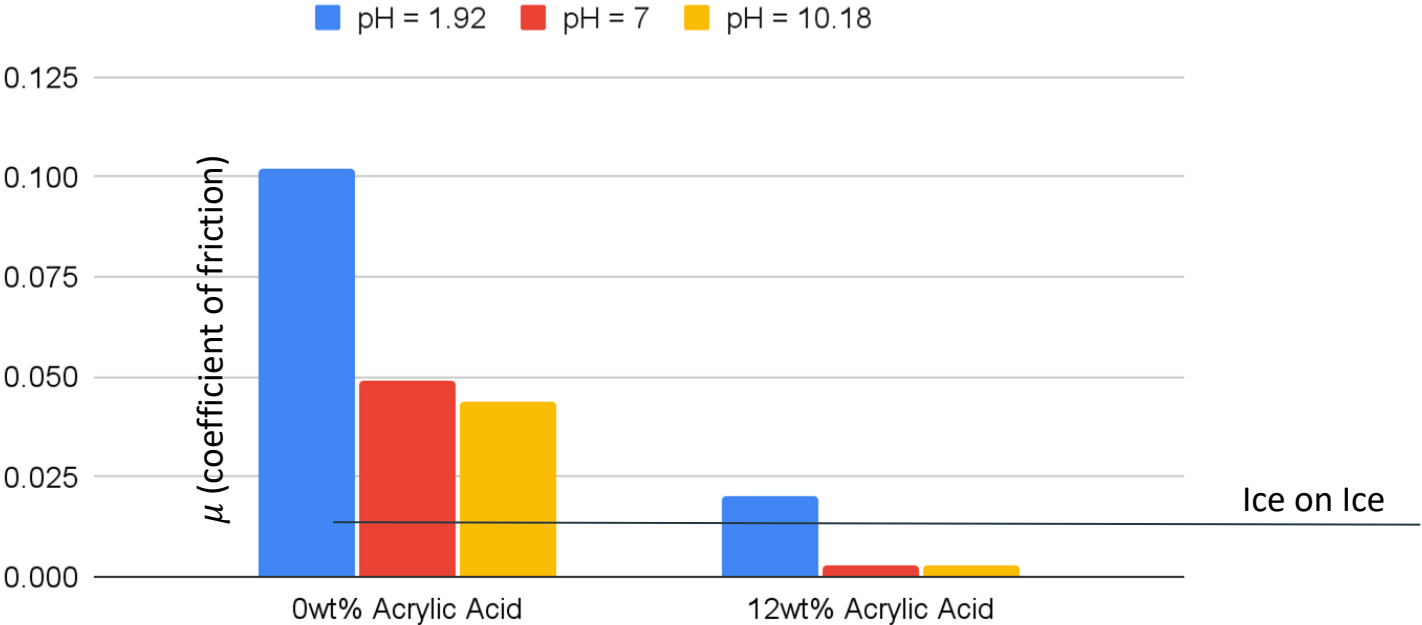
Glass probe

Slide Deck

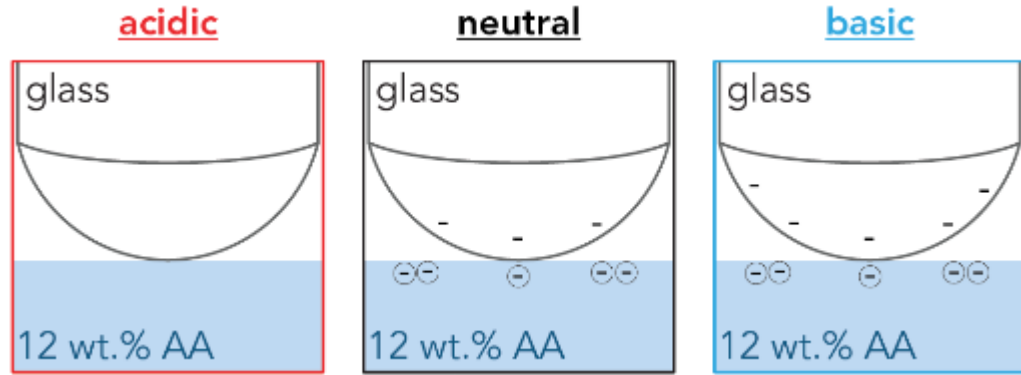
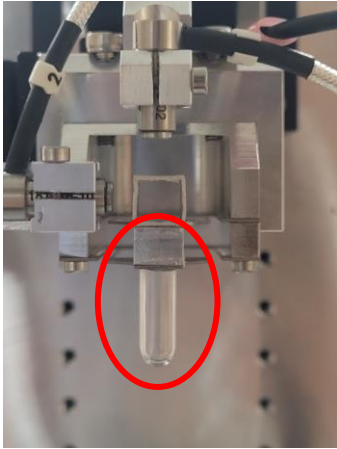
One sample stands out in terms of water content



Trend between the friction and presence of Acrylic Acid



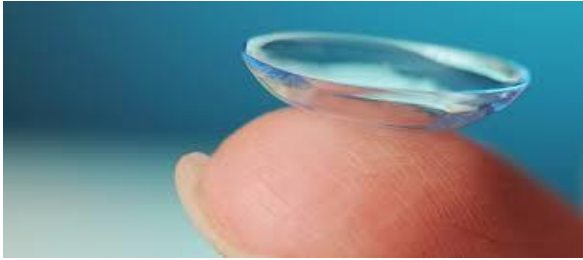
Acrylic acid and more basic solutions cause low friction



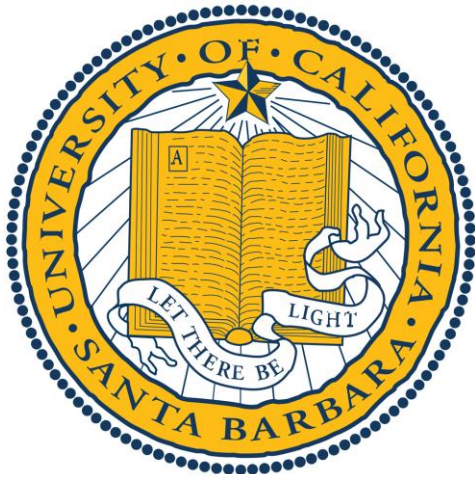
Ice on Ice: $\mu = 0.02$

Our Samples: $\mu = 0.003$

Biomedical devices can benefit from understanding hydrogels



Acknowledgments



Pitenis Lab
Allison Chau

UCSB

CNSI

CSEP

SIMS

Peer Mentors
Super Mentors



Thank you for listening!

Are there any questions?