PARTICLE IMAGE VELOCIMETRY OF OPTICALLY STRETCHED HUMAN MAMMARY EPITHELIAL CELLS

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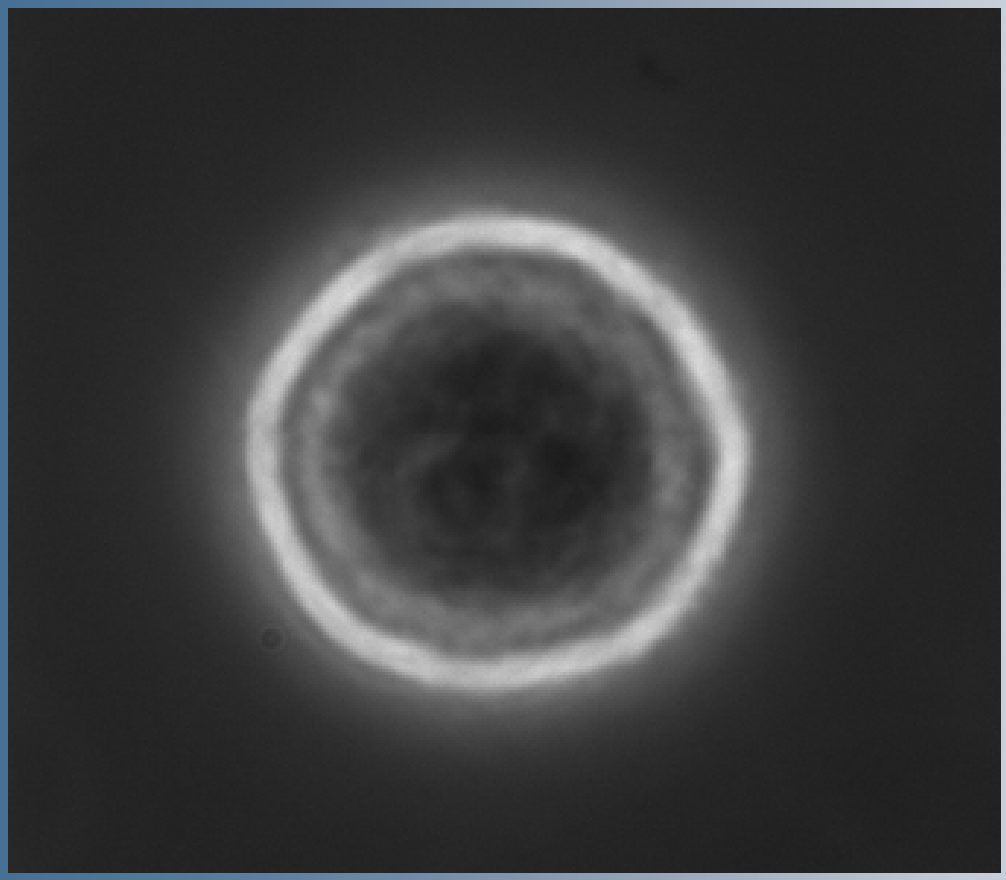
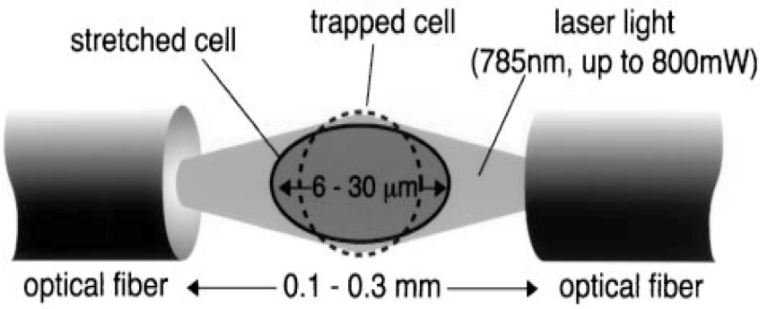
TREND
FAIR 2011

Optical Stretcher



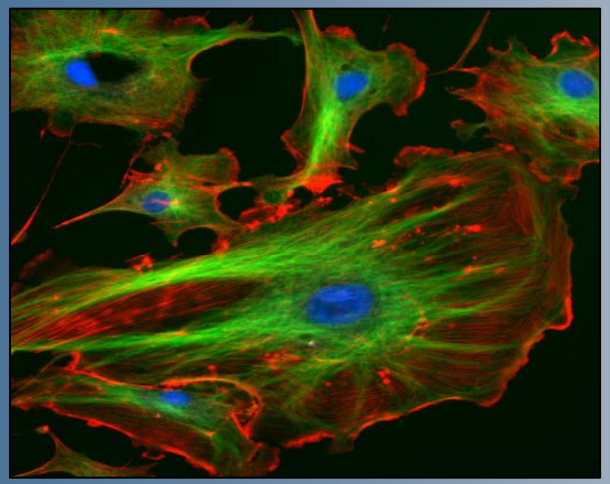


Are metastatic cells "stretchier?"

- HMEC-GFP (Less cancerous)
- HMEC-TWIST (More cancerous)

Guck et al. Biophysical Journal 81 2001 pg. 767-784

So Far



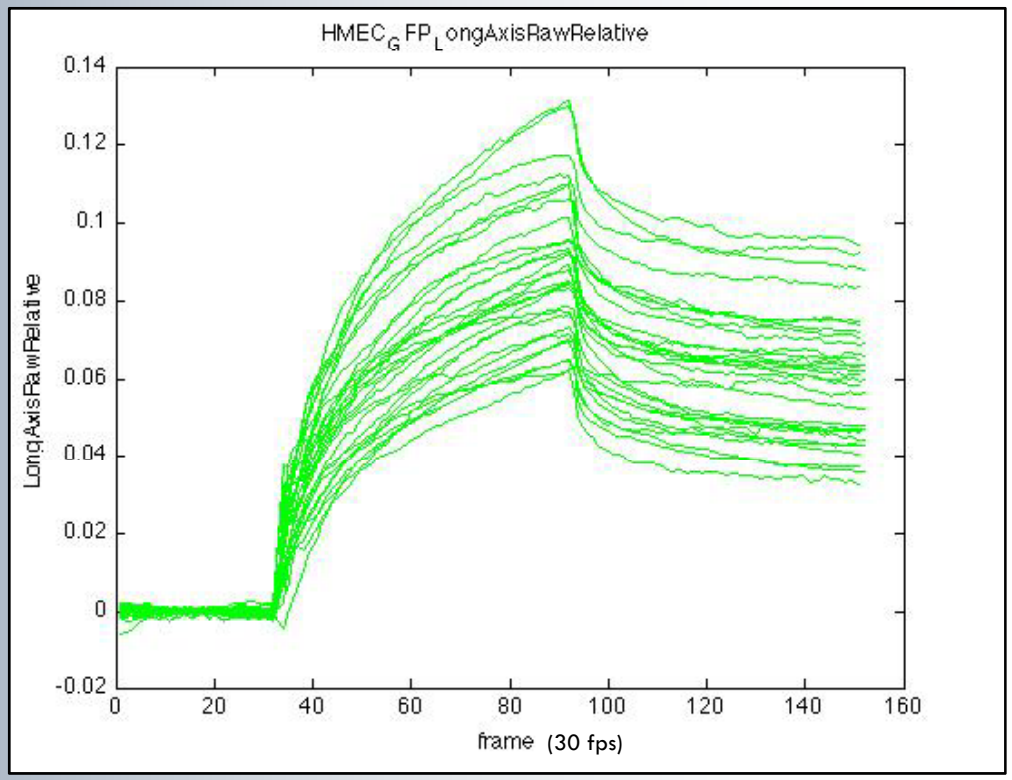
Wikimedia

Shape Analysis

- Long axis over time

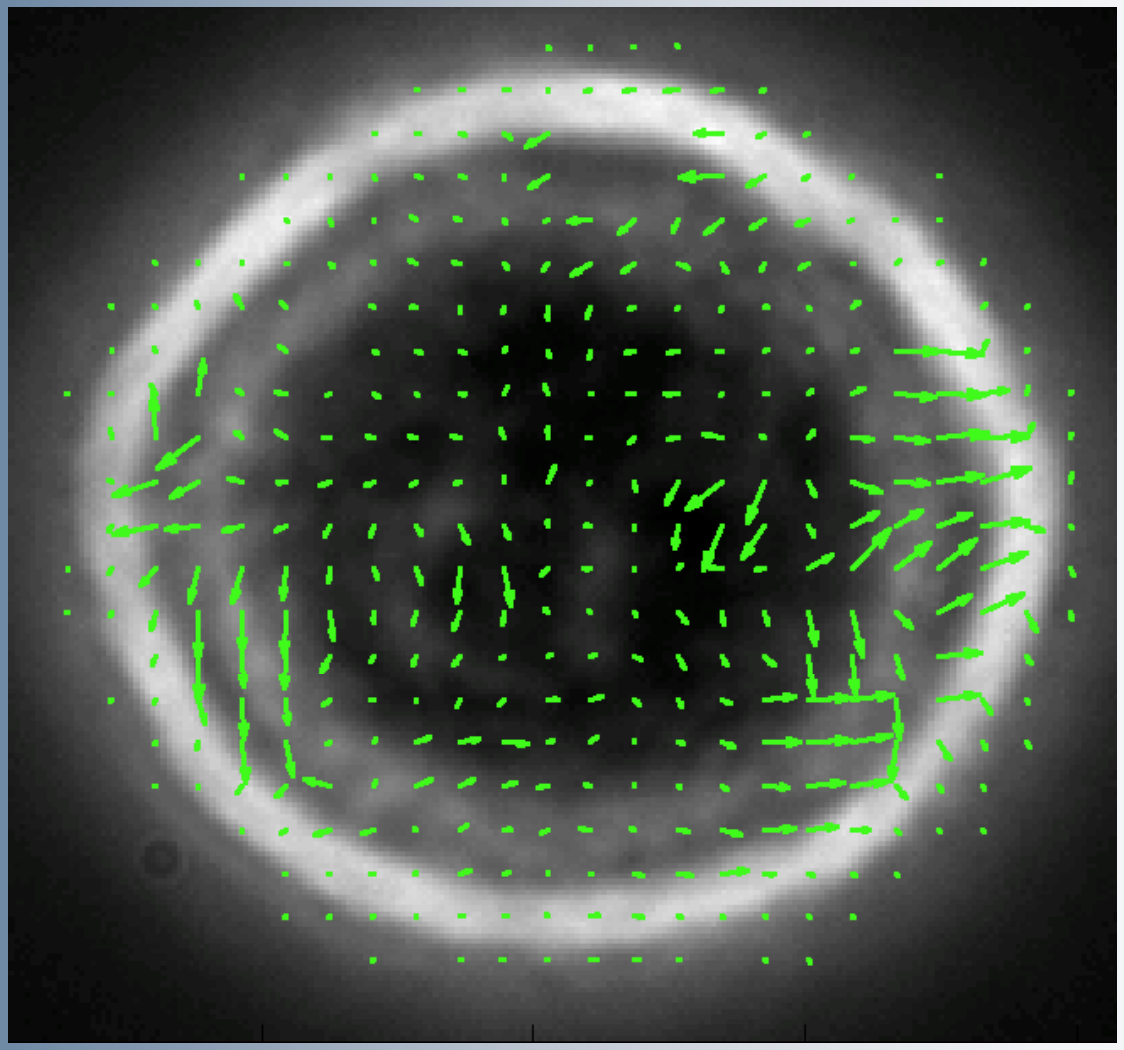
What about cell interior?

- Cytoskeleton

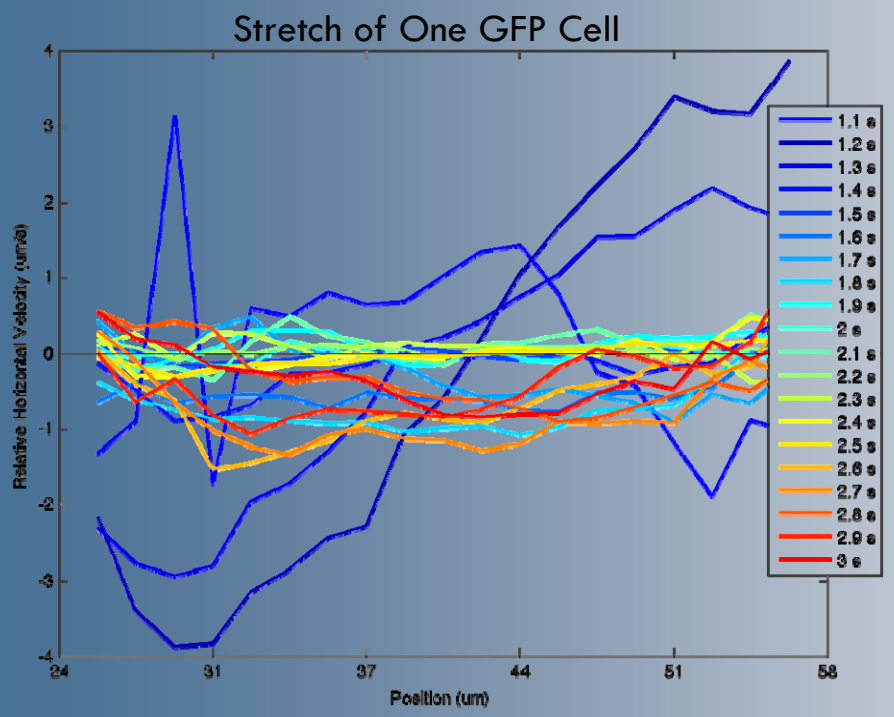


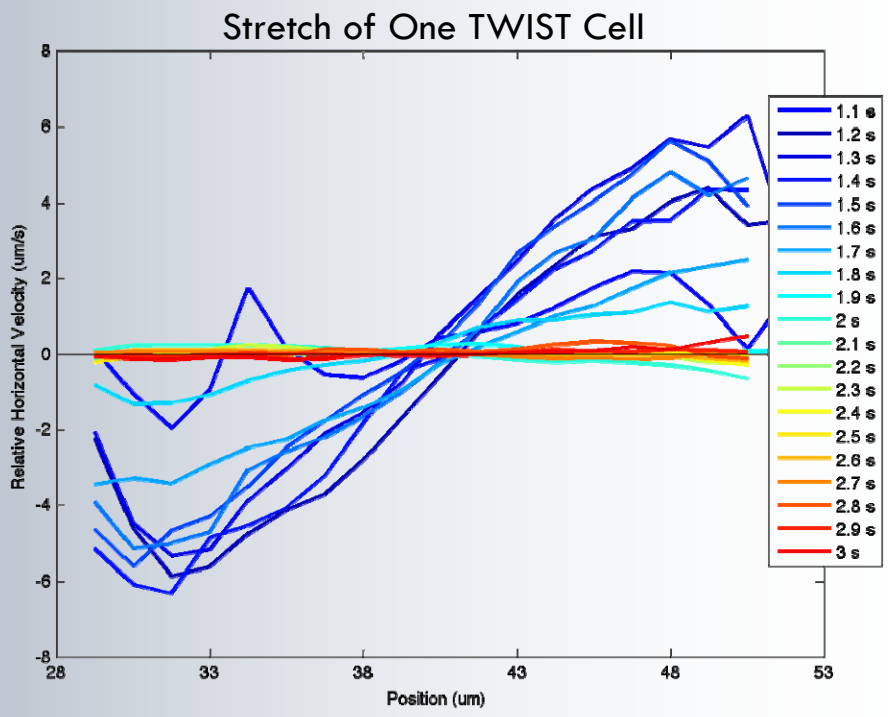
Goal: Analyze stretched cells using Particle Image Velocimetry

Particle Image Velocimetry (PIV)



GFP vs. TWIST





GFP:

- One or two strong stretches
- Stretches mostly at the beginning

TWIST:

- More consistent stretch
- Weaker, but longer stretch

Conclusions

- Stretchiness: Inconclusive
- Viscoelastic Actin model
  - GFP: More elastic
  - TWIST: More viscous
- **PIV is a viable analysis technique for optical stretcher cells**