

# Nano-mechanical Aspects of Cell-Matrix Interactions

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2011 MSM Consortium Meeting (Oct. 5)

- Cells *don't* see the matrix as a whole
- Cells interact with filaments in its immediate vicinity

## Goal:

Understand the *micro-environment* of the collagenous matrix

## Ingredients for our goal:

- *Single collagen molecule*: Dynamical properties
- Collagen *self-assembly*: interaction between collagen molecules
- Degradation: Collagen proteolysis by *matrix metalloproteinases* (MMPs)
- *Controlled experimental platform* for studying cellular remodeling of collagen matrices (2-D; later extend to 3-D)

# Multidisciplinary Partnership

- Wonmuk Hwang (TAMU BME): Molecular mechanics
- Roland Kaunas (TAMU BME): Cell mechanics
- Alvin T. Yeh (TAMU BME): Nonlinear optical microscopy
- Kayla Bayless (TAMUS HSC): Cell/MMP biology
- Andreea Trache (TAMUS HSC): AFM instrumentation