

# The Effects of T $\beta$ 4 on Cell Motility and Traction Forces of Fish Scale Keratocytes



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# Goals and Objectives



- **Model:**
  - We use cells which come off of fish scales for our studies
  - They are a good fit for cell motility research because they are actin polymerizing machines and all they do is move
- **Background:**
  - The Jacobson lab has already showed that uncaging caged TB4 in the wing causes the cell to turn
  - We want to measure traction forces upon uncaging and cell turning
- **Hypothesis:**
  - TB4 is an actin sequestering protein which changes the predominate form of actin in the cell into the non-polymerizable form
  - TB4 will alter the cell forces and cell motility
  - TB4 will alter cell/matrix(surface) interactions
  - We can use IRM imaging in order to determine the effects of TB4 on the cell adhesions
- **Goals:**
  - Design an elastic substrate for cell adhesions and traction measurements
  - Successful loading TB4 and caged TB4 into keratocytes
  - Determine the effects of TB4 on keratocytes

The top of the slide features two microscopy images. On the left, two cells are shown against a light background; one is bright and crescent-shaped, while the other is darker and more irregular. On the right, a single bright, crescent-shaped cell is shown against a dark background. In the center, the word "Results" is written in a large, teal, serif font. Below the title is a decorative graphic consisting of two concentric circles, with a horizontal dashed line passing through the center of the inner circle.

# Results

- **Results:**

- Cells were successfully loaded with fluorescein dextran and TB4. Top right image shows successful co-loading
- On IRM imaging, cells loaded with TB4 showed more adhesions to the glass, the darker outline on the left image
- The left cell on the left image, which is not loaded, is shown for comparison
- Cells moving normally upon uncaging of caged TB4 show increased adhesions shown via IRM imaging
- Established a successful control of what happens to cells loaded with TB4

- **Future Directions:**

- Carry out protocol on elastic substrate and acquire traction force data
- Real time imaging of cell on elastic substrate which changes Young's Modulus with temperature to see how forces change