

# Image Analysis and Model of Cytoskeletal Filament Density of C17.2 Cells

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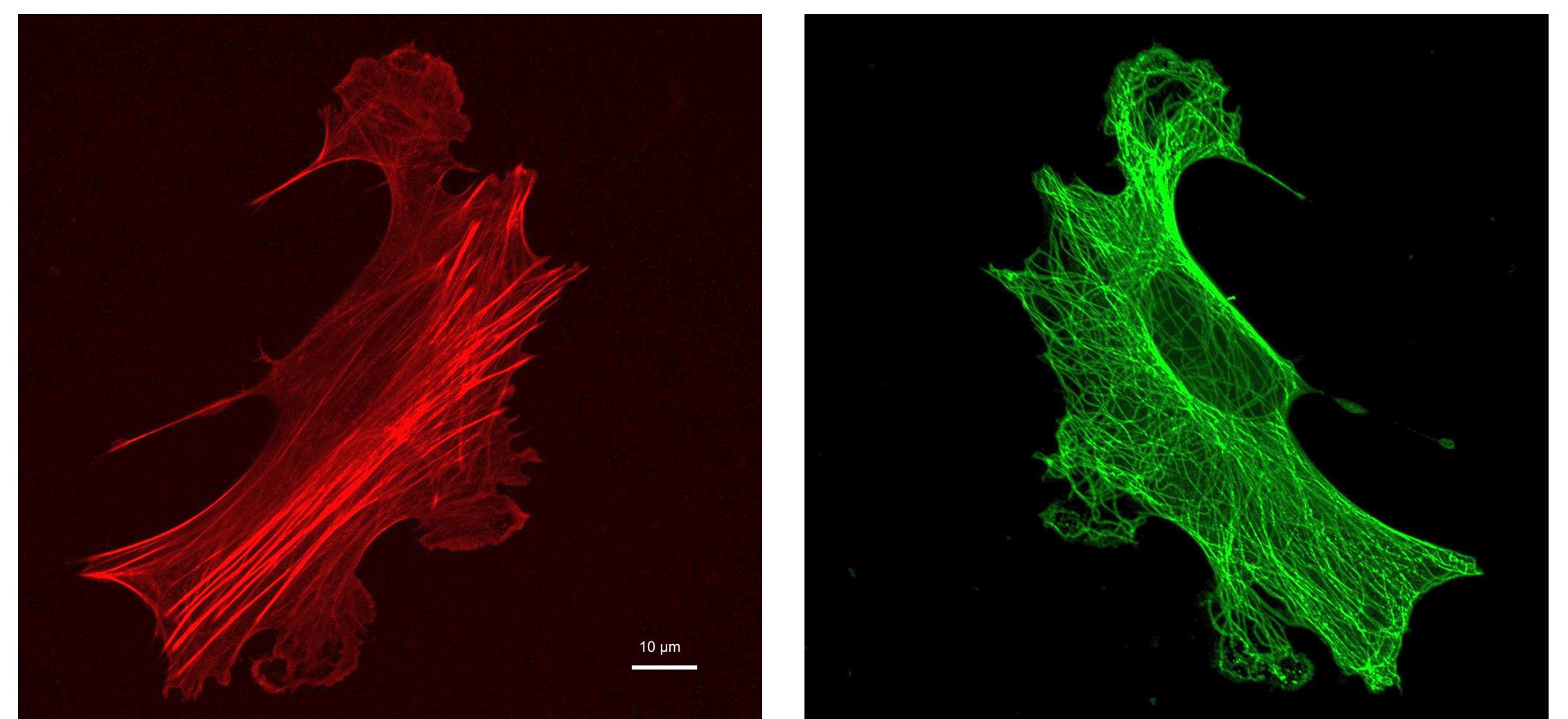
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## Background

Stem cells are undifferentiated cells that possess the ability to self-renew and give rise to more specialized cells

C17.2 stem cells are used in this study; these cells were derived from mouse cerebellum

This study focuses on actin and nestin protein filaments which are responsible for cell mobility, division, and growth

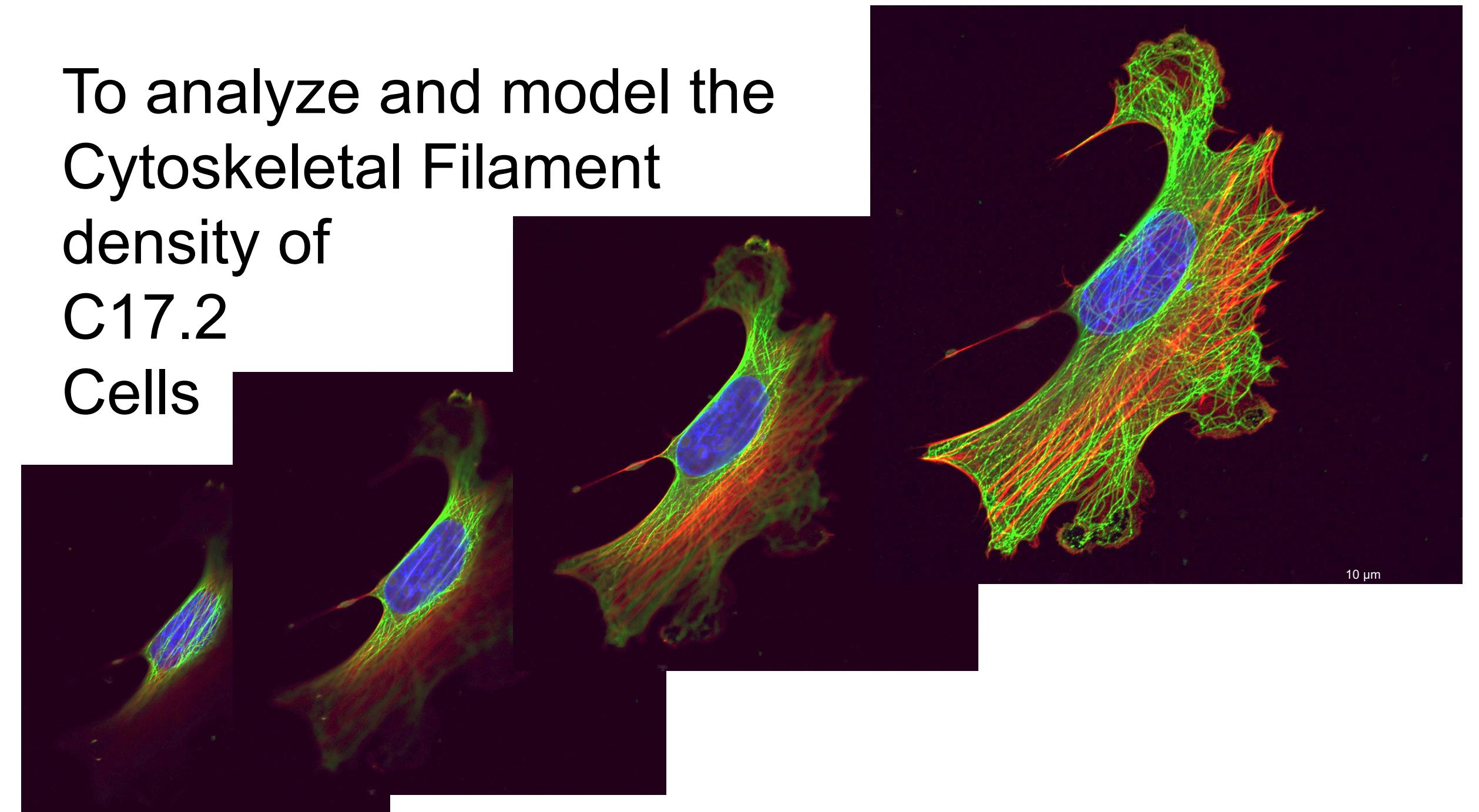


Preliminary results showed that the distribution of actin seemed to change after the SWCNT were added to the cells

Filament Sensor (FS) is an image processing program that will trace filaments on an image. It uses a line gaussians which improves the quality and speed of tracing

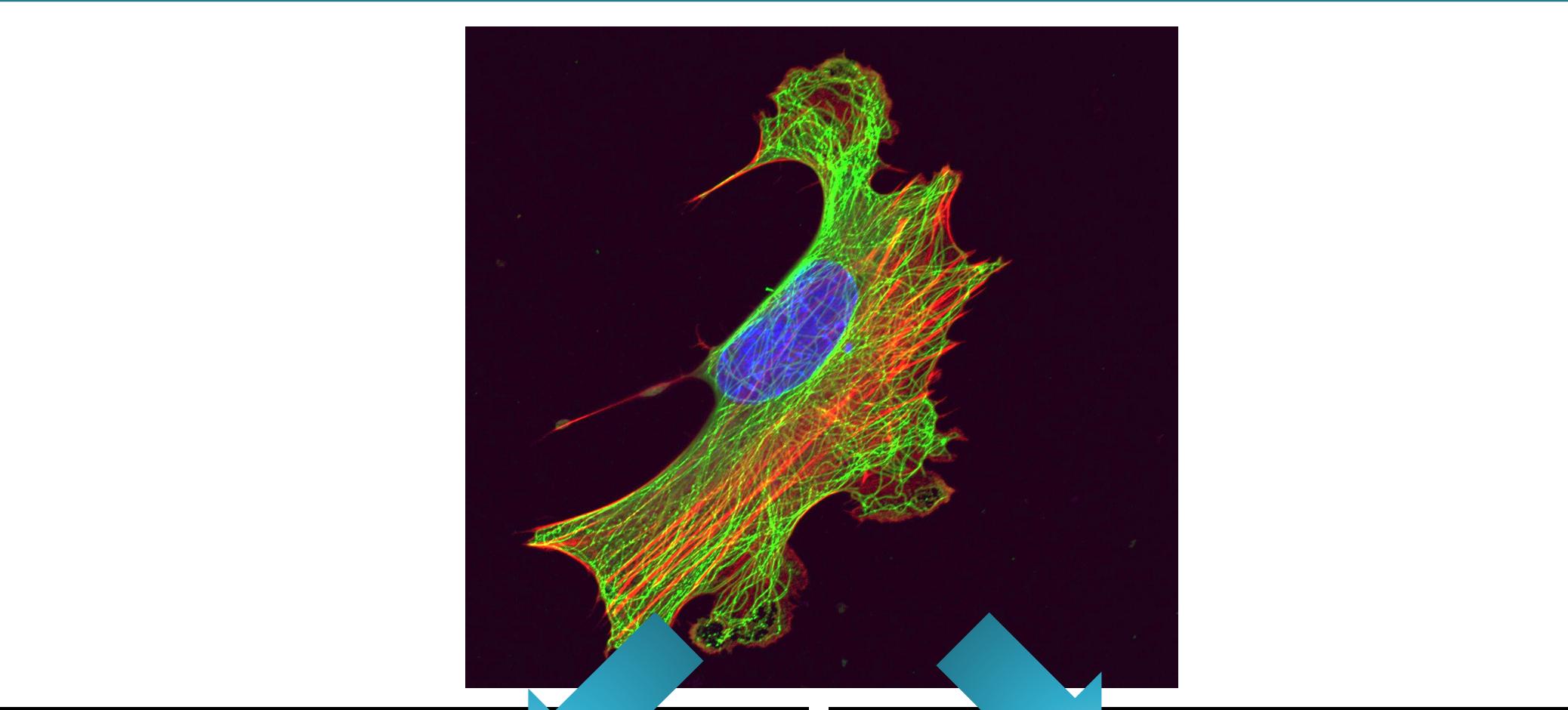
## Goals

To analyze and model the Cytoskeletal Filament density of C17.2 Cells

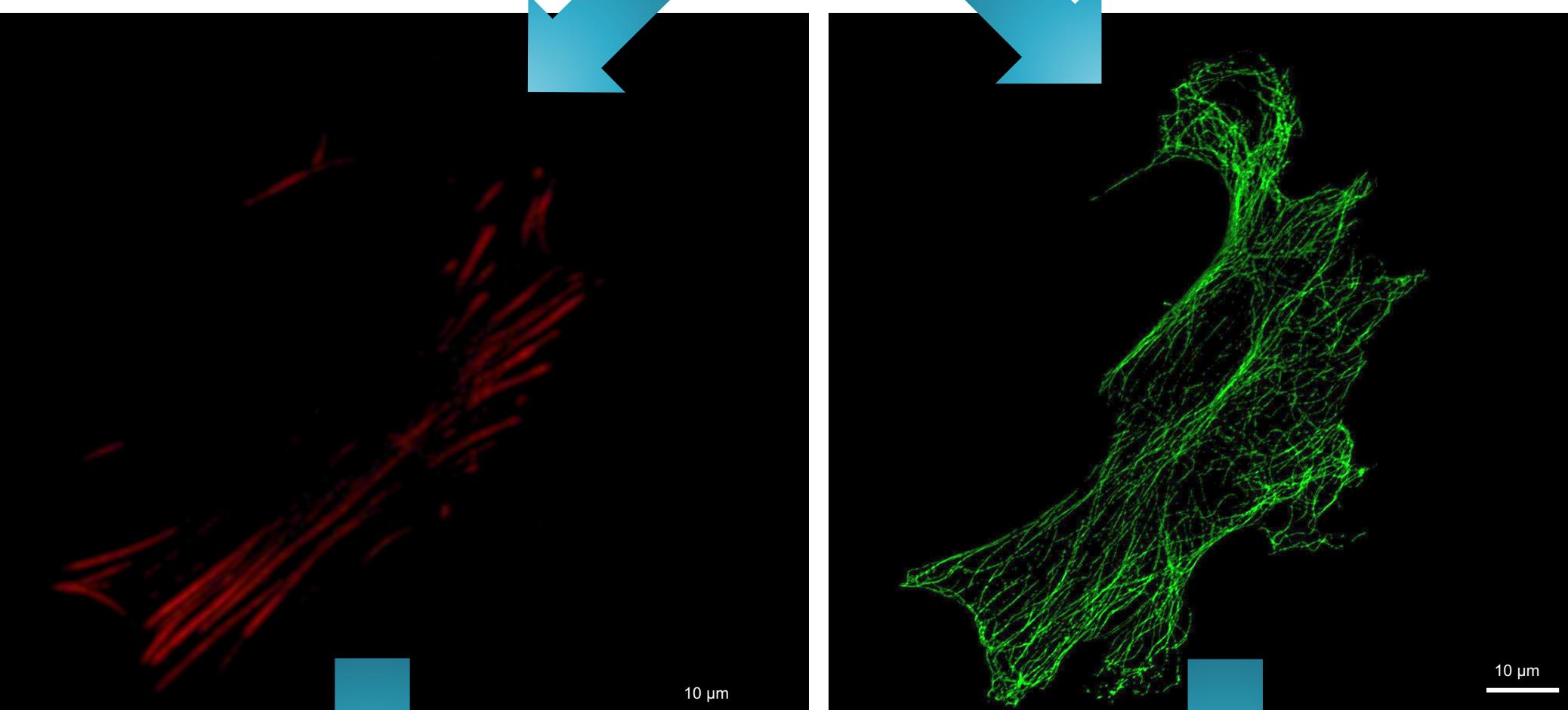


## Methods

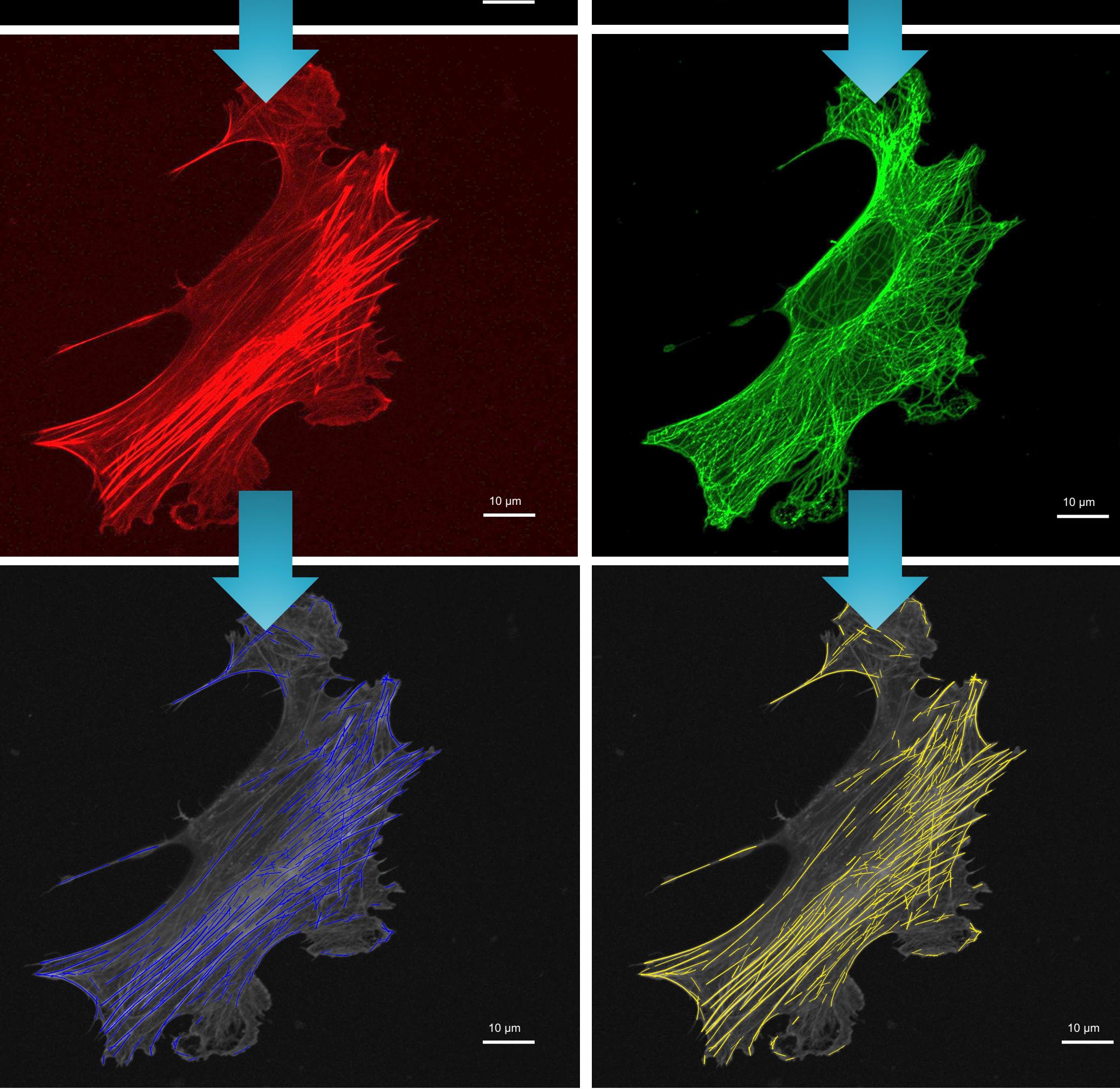
Split channels



Enhance color balance



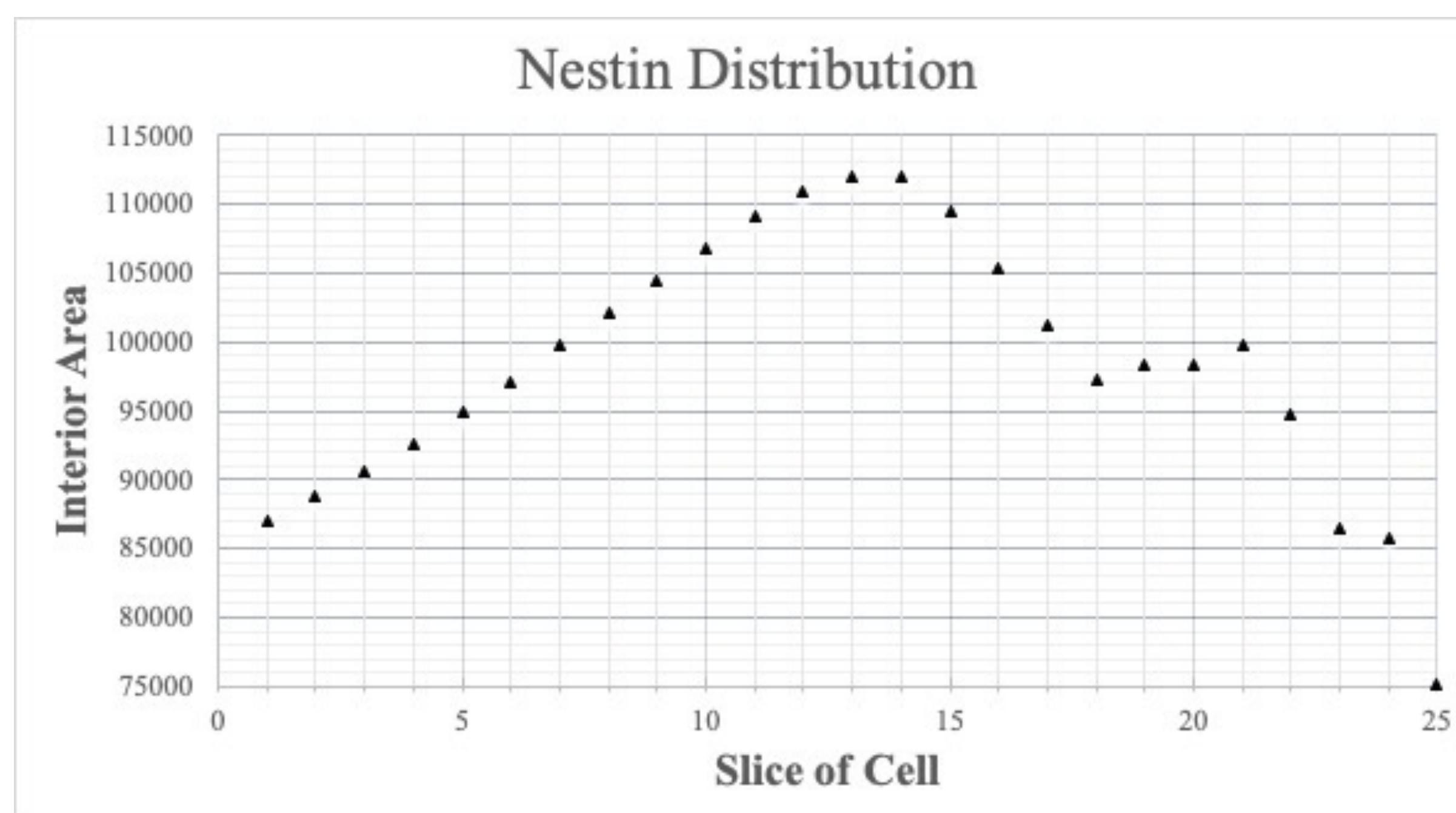
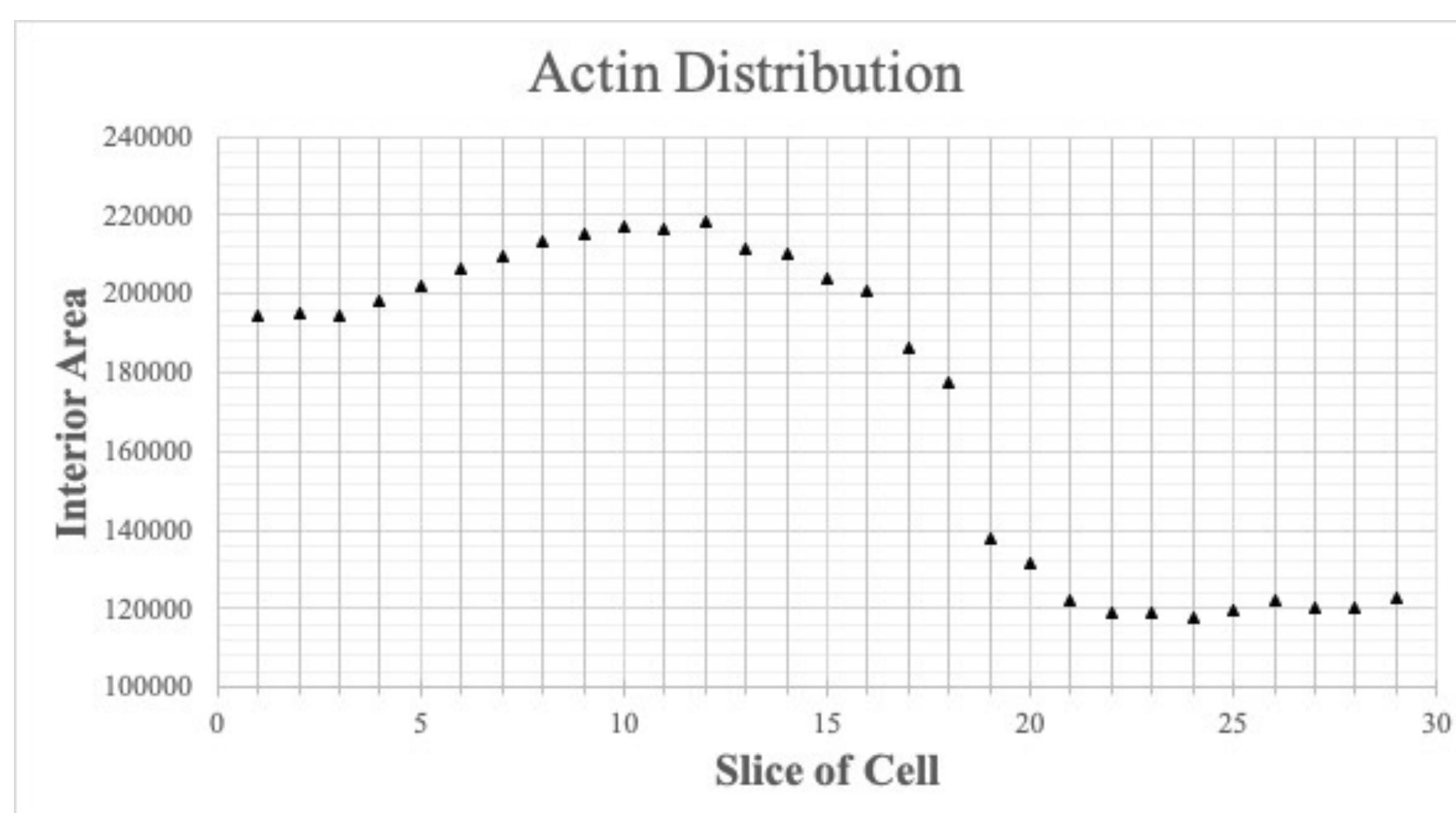
Filament Sensor exports filament images and .csv files



## Discussion and Results

Filament Sensor can analyze each cell and batch process the number of filaments, length and width of each filament, the area of the cell, and the orientation fields in the cell

Fiji will process images efficiently, however, it requires a large amount of memory



## Materials



### Confocal Imaging

- Nikon C2/Eclipse Ti
- Nikon Images of Treated cells average 0.025-micron steps



- FIJI Software, nd2reader, and Filament Sensor (FS)
- FIJI is just imageJ
  - Image processing software

## Acknowledgments



## Future Work

Complete image enhancement program through Fiji get equal color balancing to all cell images

Add nanomaterials and comparing them to untreated cells

Explore the use of Python to collect, organize, and evaluate data