

## ABSTRACT

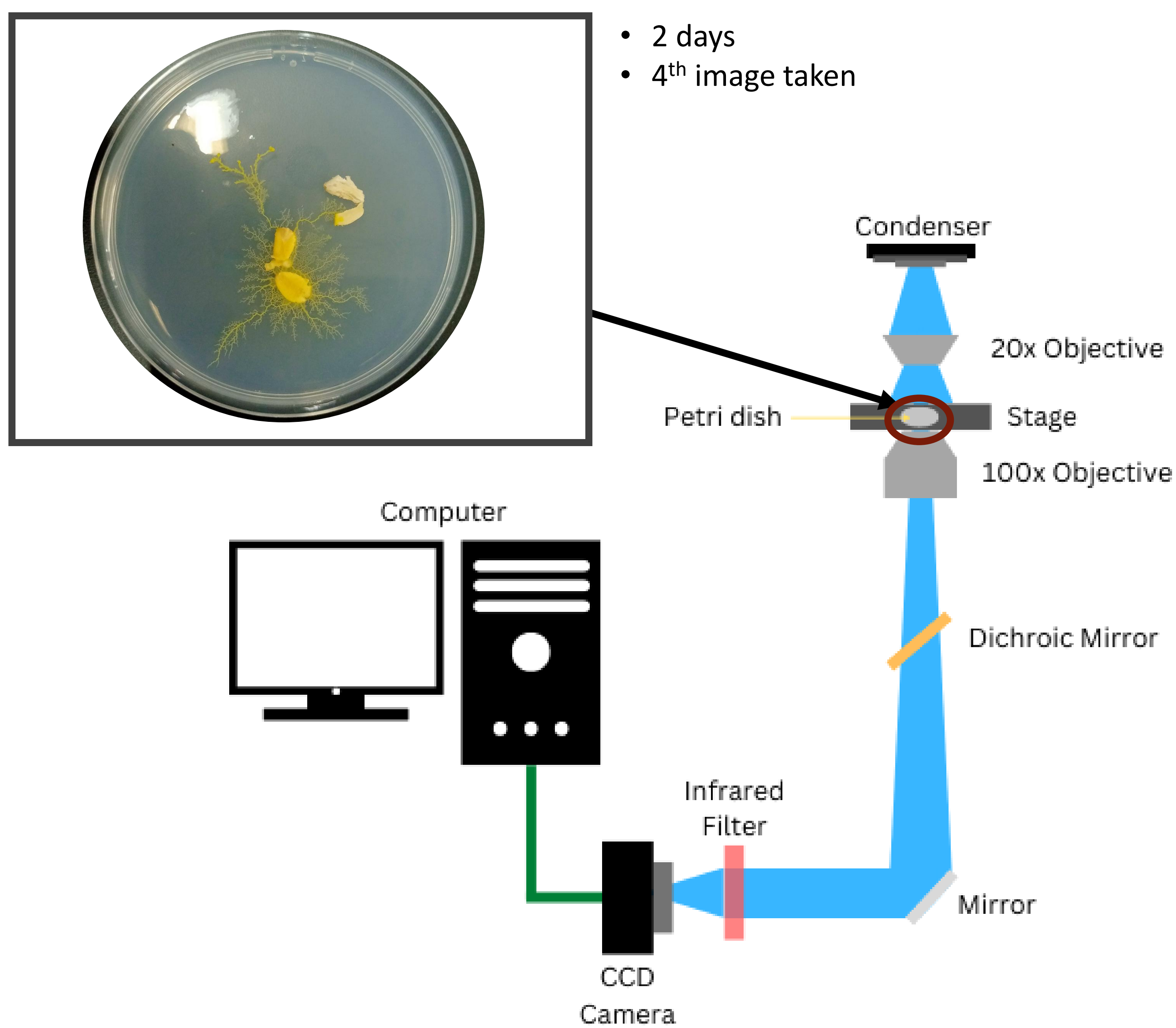
The slime mold, *Physarum polycephalum*, is a model organism for non-centralized biological organisms used to examine motility, life cycle, differentiation, and other aspects of cell biology. In this study, we examine and quantify the *Physarum*'s vein contractions via video microscopy and image morphology analysis. It has been observed that the *Physarum polycephalum*'s protoplasmic veins exhibit a rhythmic oscillation over time. Moreover, the oscillation causes streaming direction of granules to change with some time lag.

## MOTIVATION

- Examine and Quantify *Physarum polycephalum*'s protoplasmic vein contraction
- Show the relationship between *Physarum polycephalum*'s protoplasmic streaming and vein contractions under controlled conditions

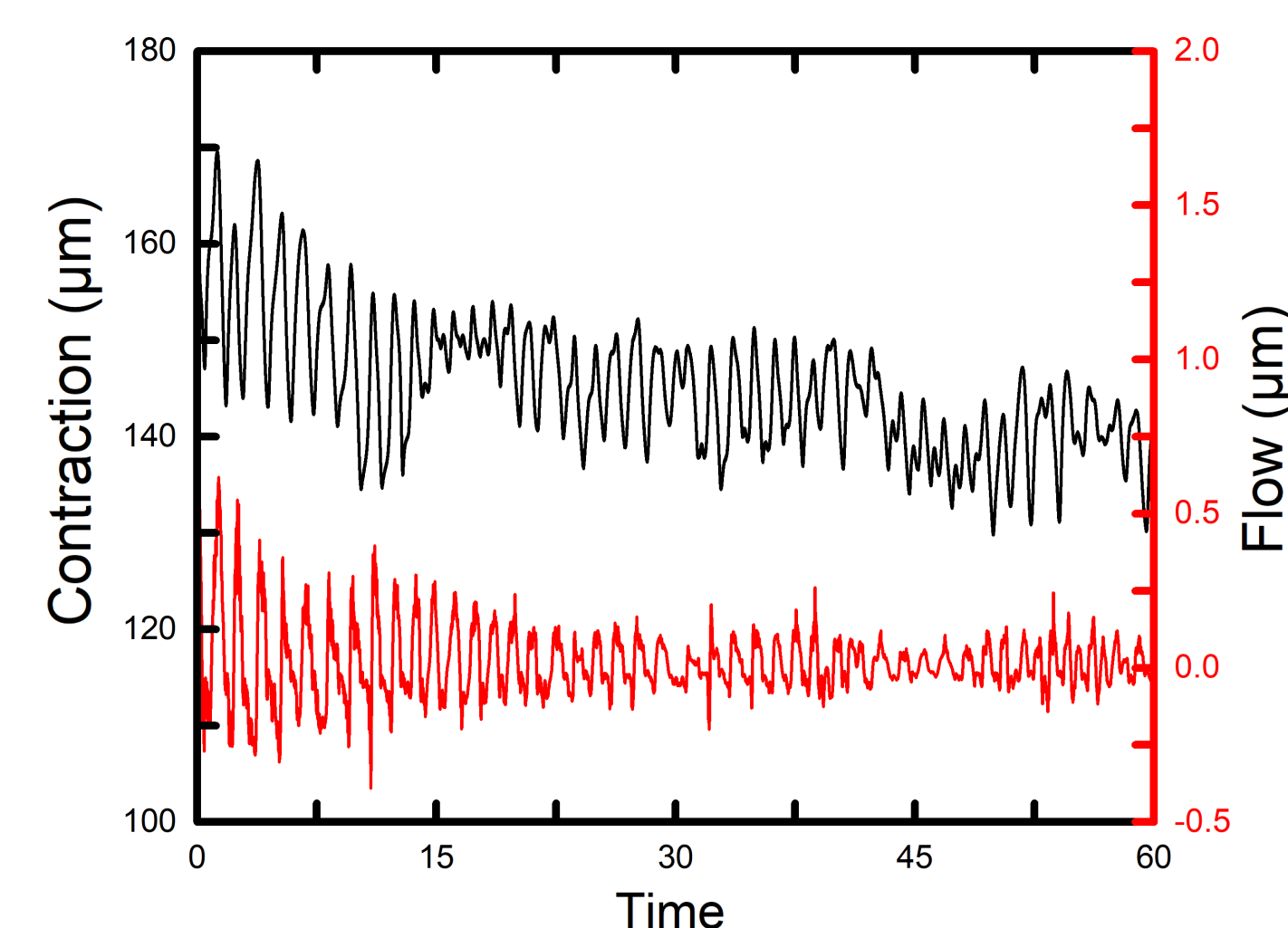
## METHODOLOGY

### Experimental Setup

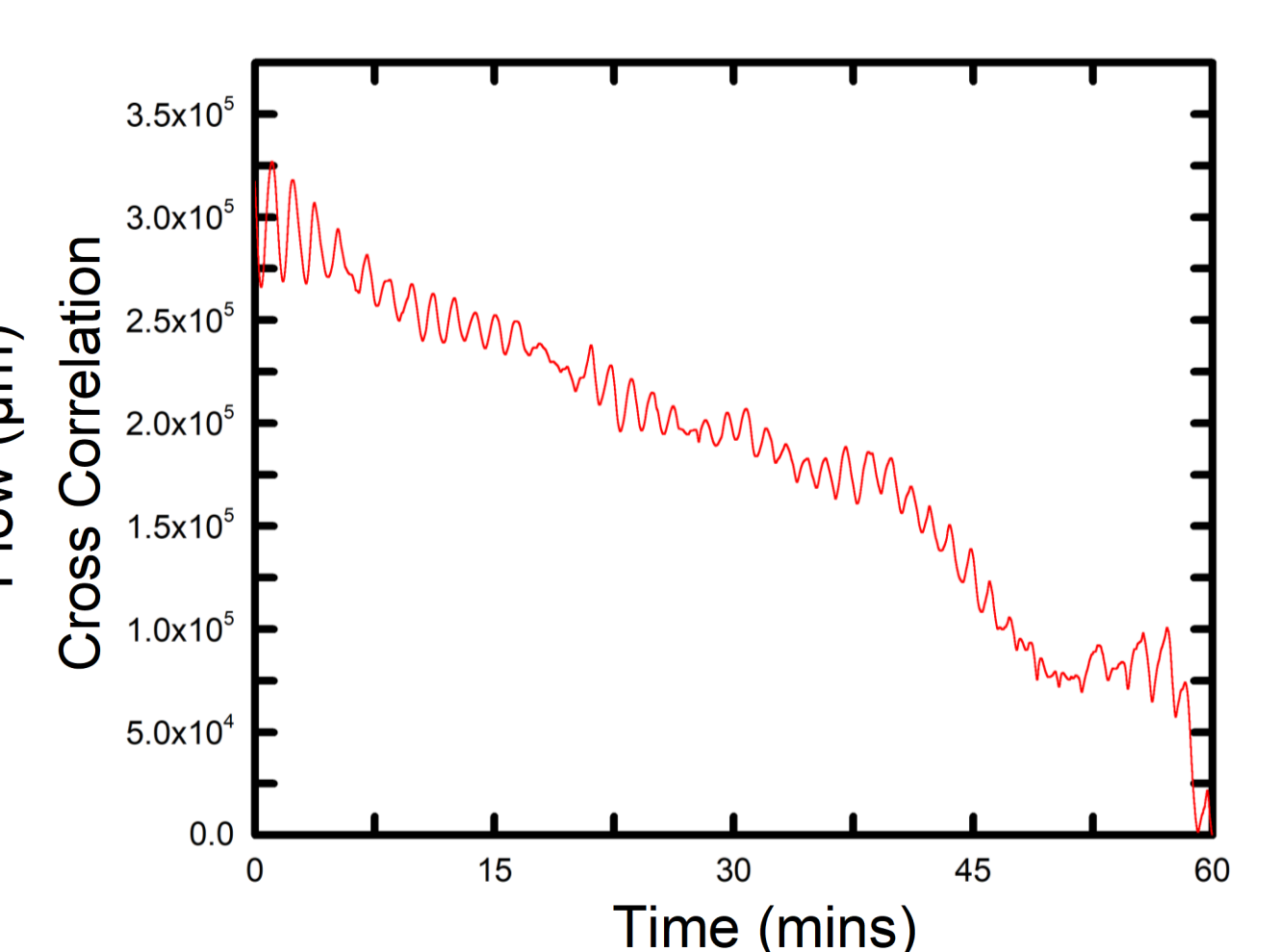


## RESULTS

### Contraction-Flow Vs Time Graph

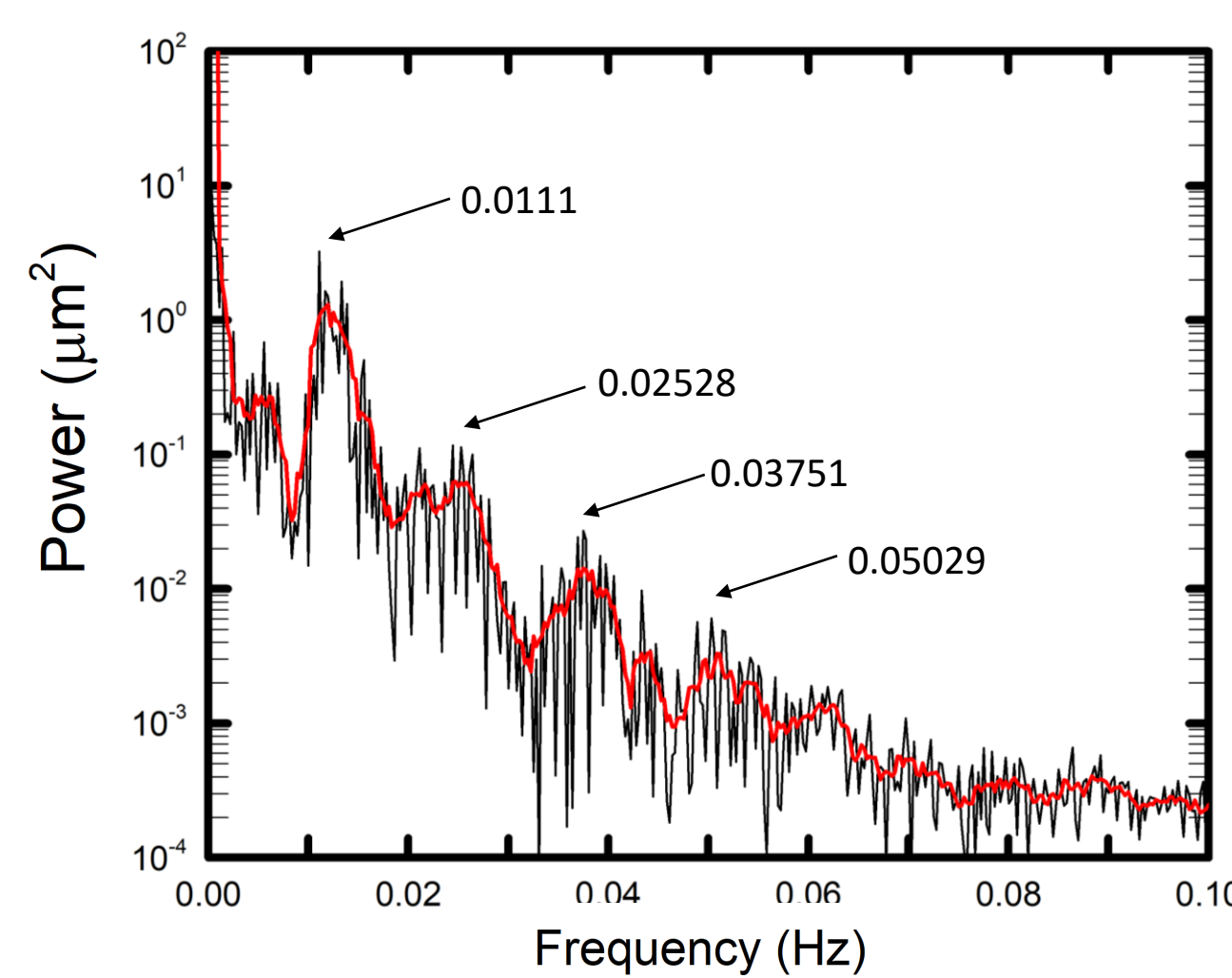


### Cross Correlation

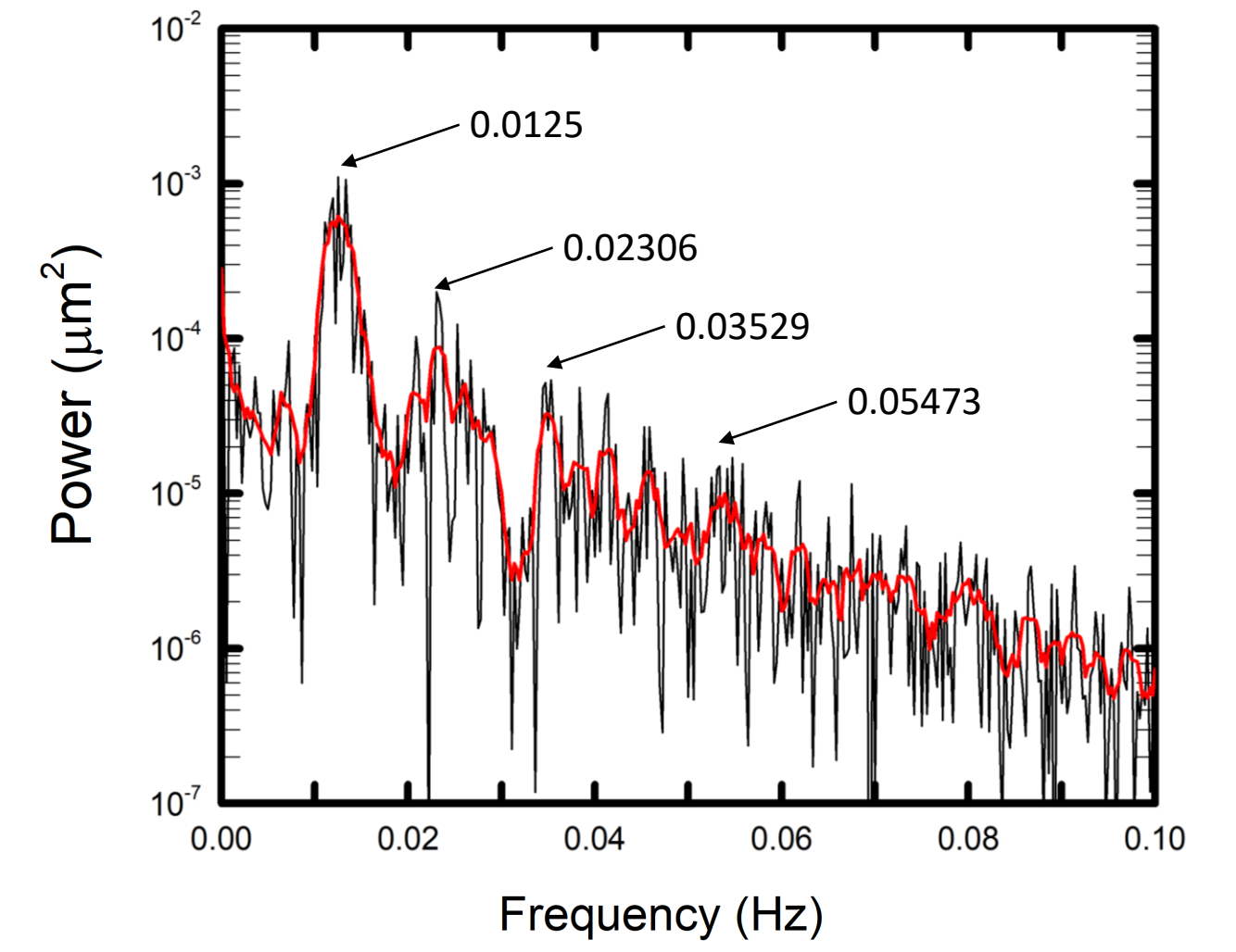


### Power Spectrum

#### Contractions

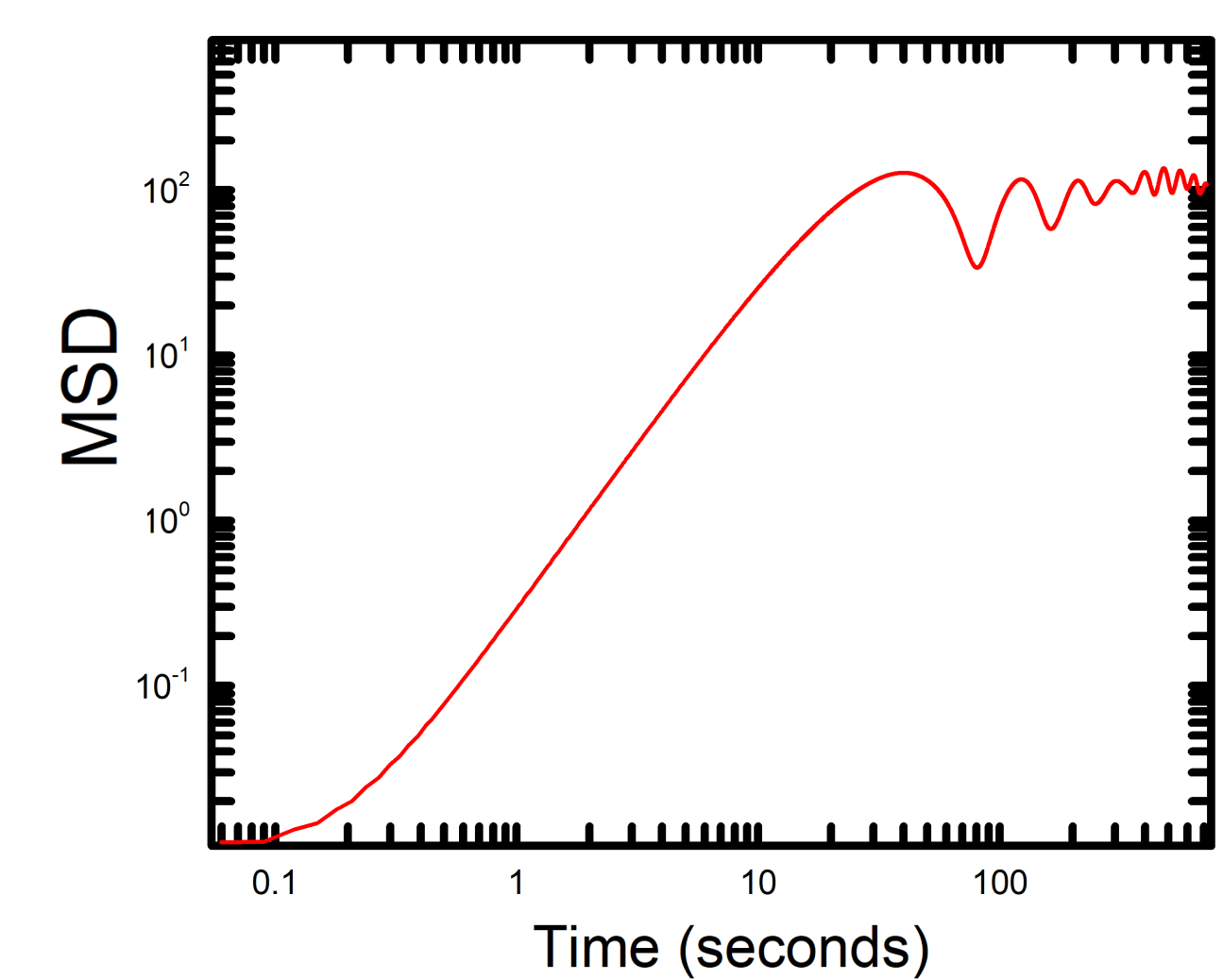


#### Streaming

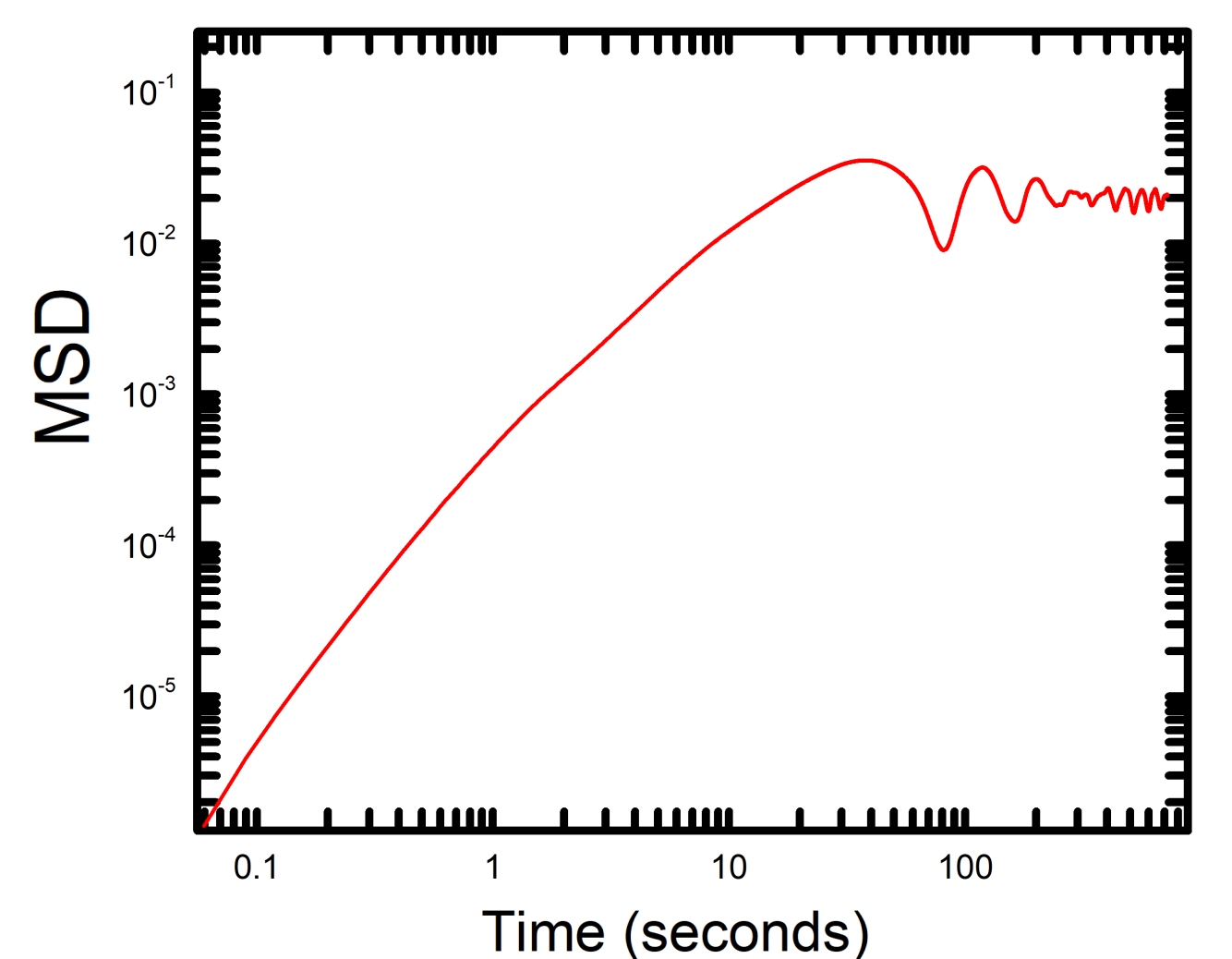


### Mean Squared Displacement

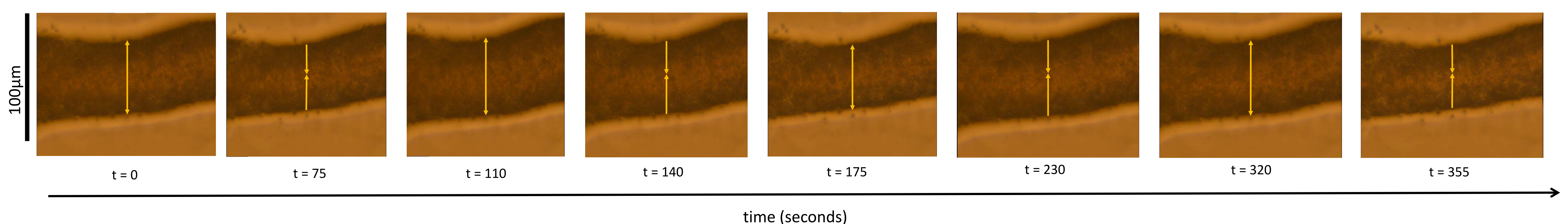
#### Contractions



#### Streaming



## Vein Contraction



## SUMMARY

- We were able to examine the protoplasmic vein contraction of *Physarum polycephalum* via video microscopy and quantify protoplasmic vein contraction using image morphology analysis.
- We observe rhythmic oscillation over time for both the vein contraction and streaming.

## ACKNOWLEDGEMENT

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