

# MyoGrowth

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Chase Vickery

Campbell Muscle Lab

Department of Physiology and Muscle Biology

University of Kentucky

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- Goal
  - Muscle Growth Overview
  - Software Considerations
  - Program Details
  - Working with the Program
- 
- Future Possibilities

# Overview

# Goal

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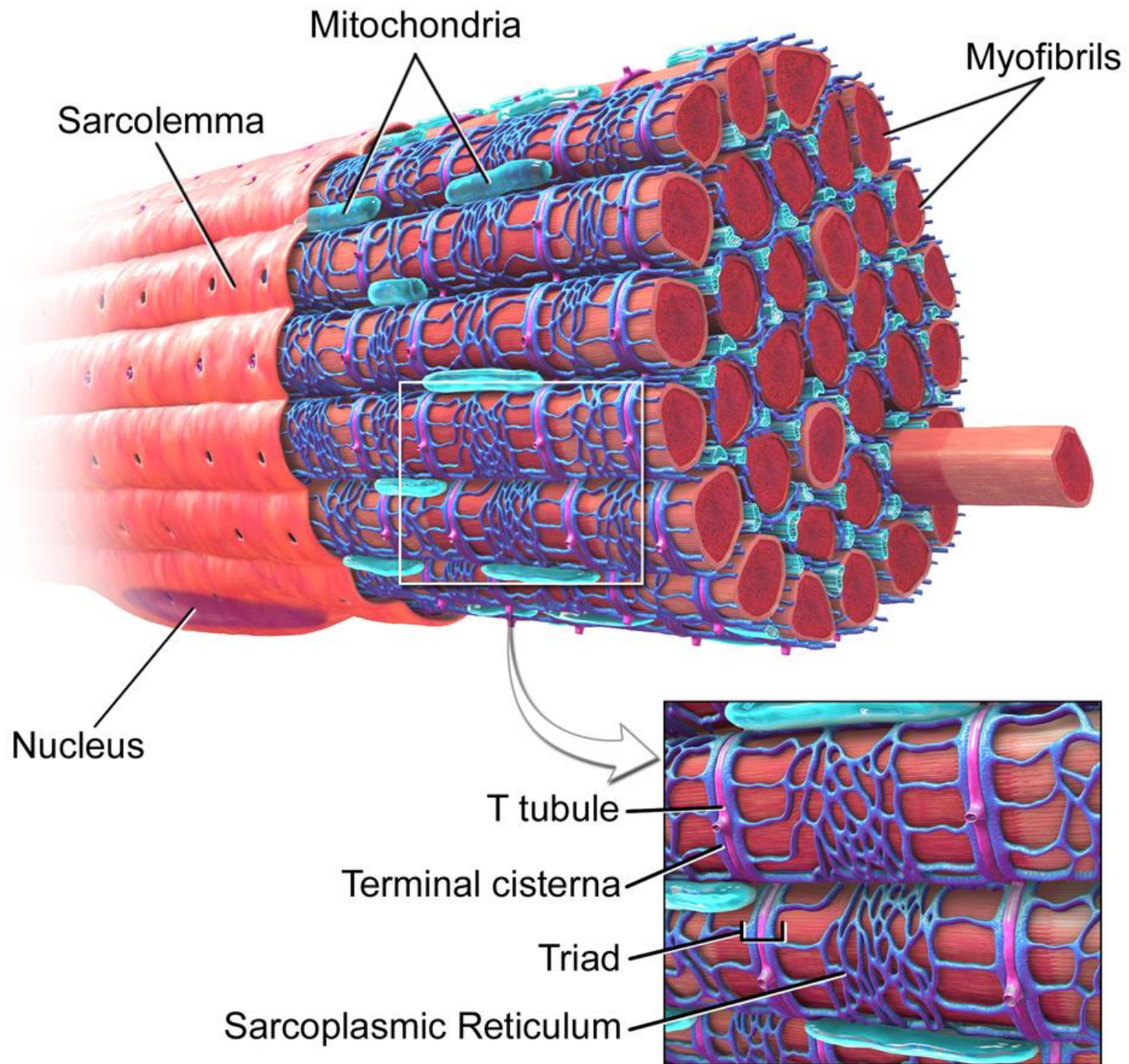
Muscle Regeneration Concepts



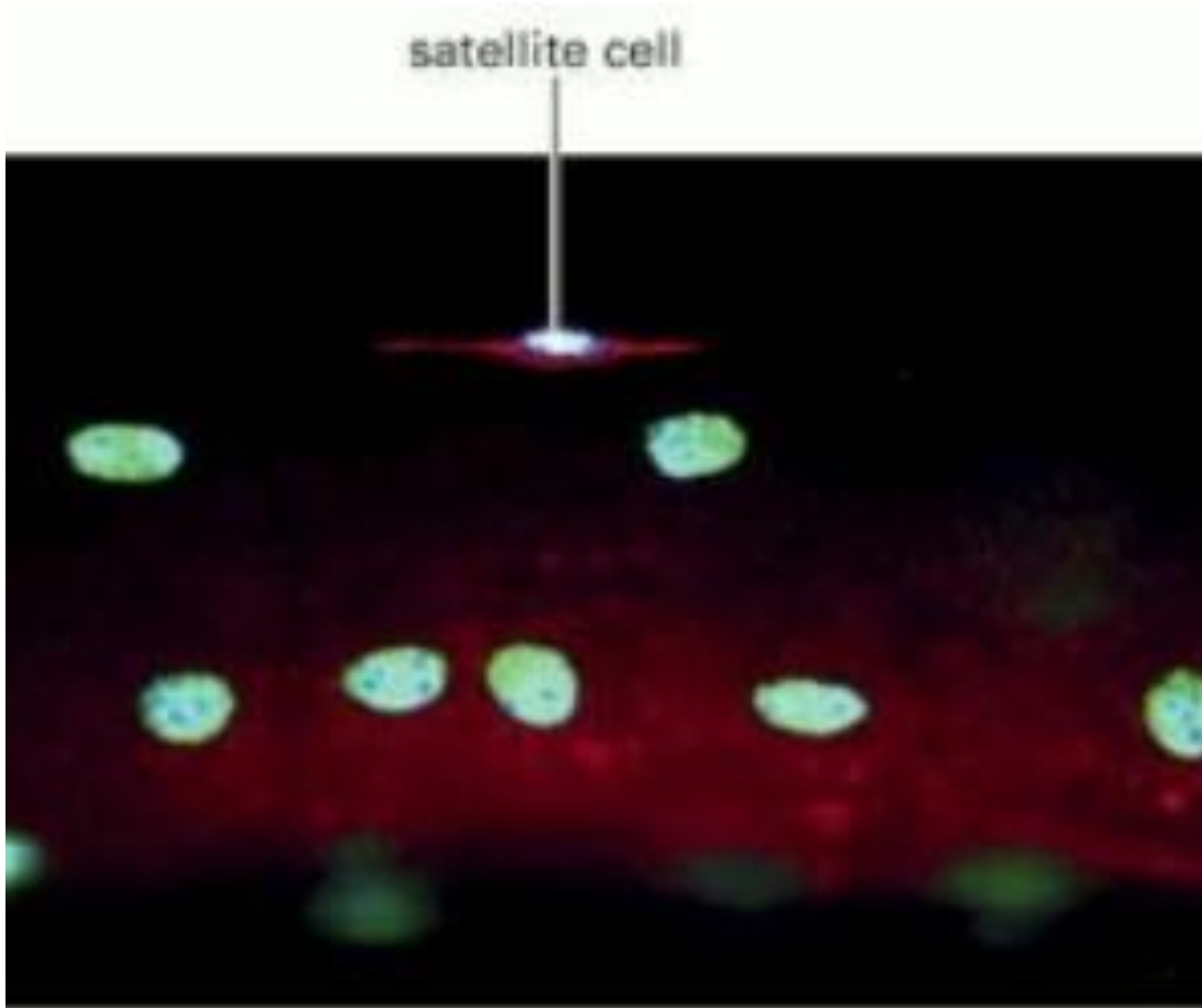
Agent-Based Model



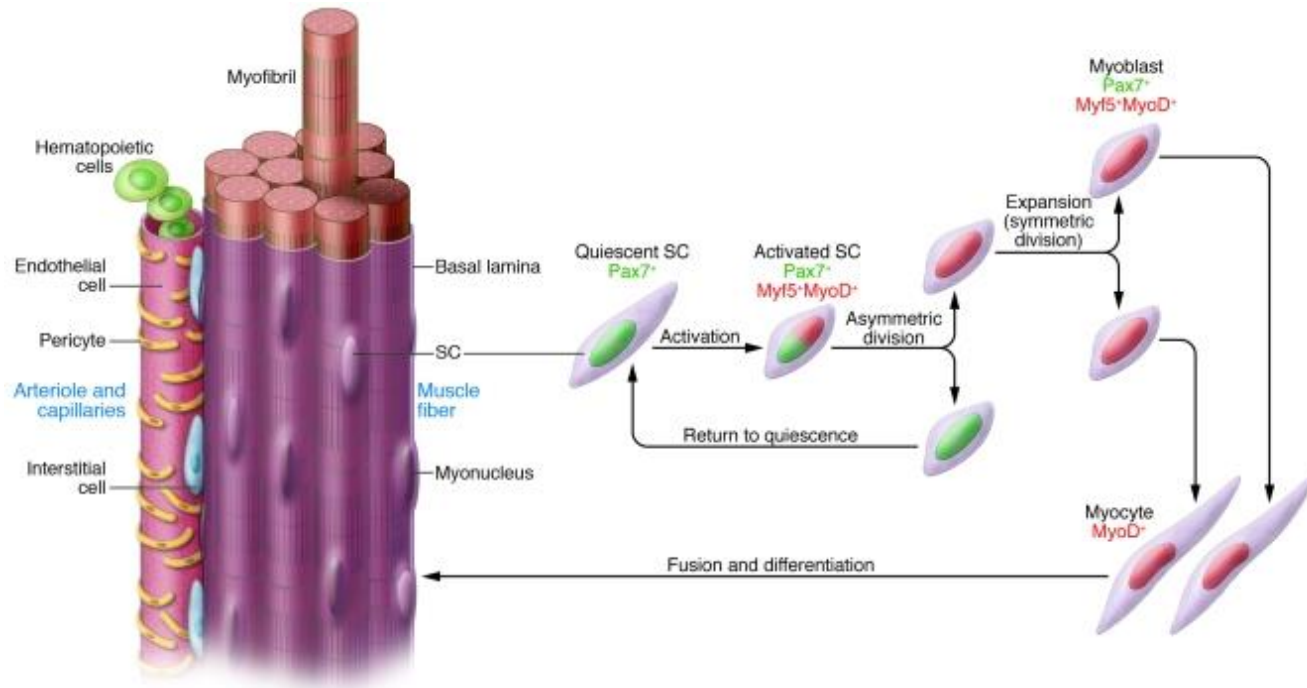
Predictive Model



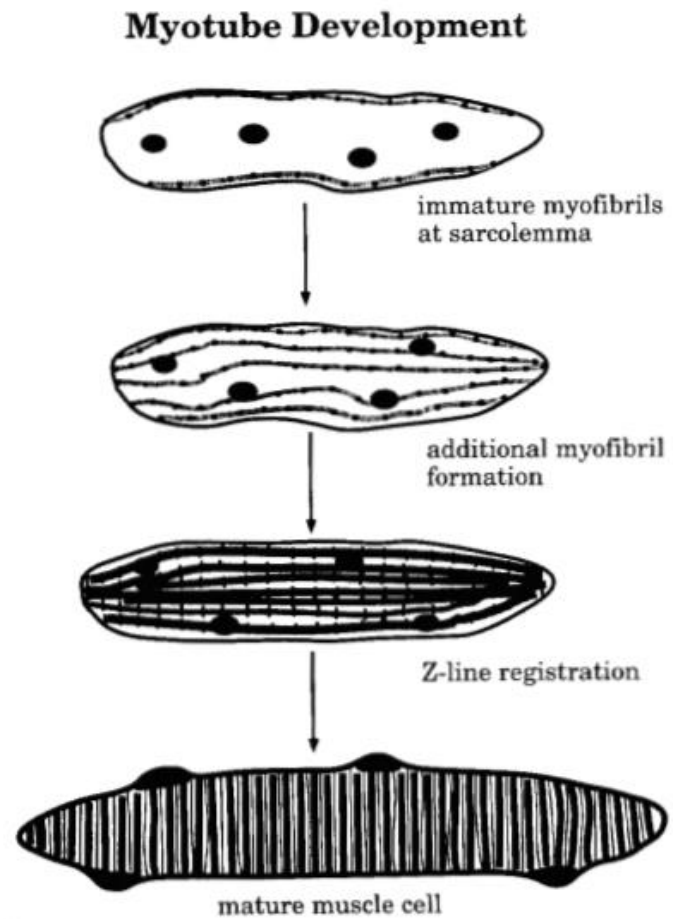
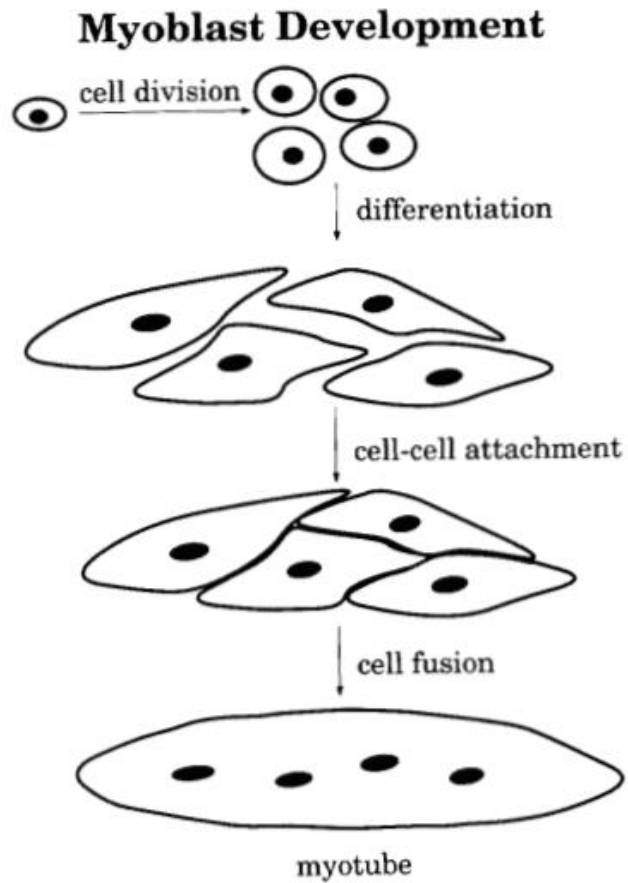
# Muscle Fibers



# Muscle Formation



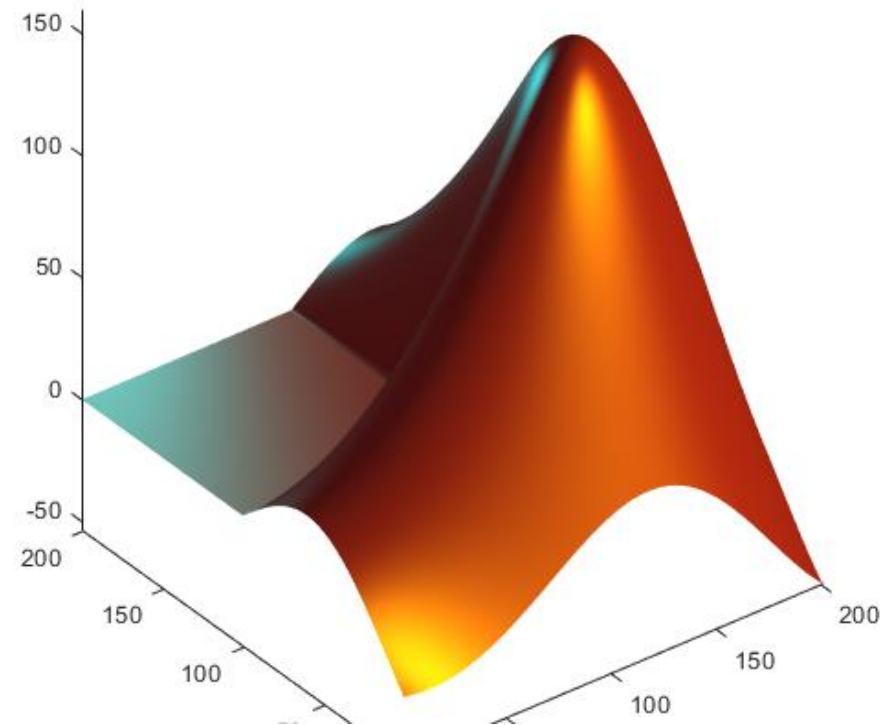
# Muscle Formation



# Muscle Growth

# Choosing the Software

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<http://www.spiderland.org/s/>

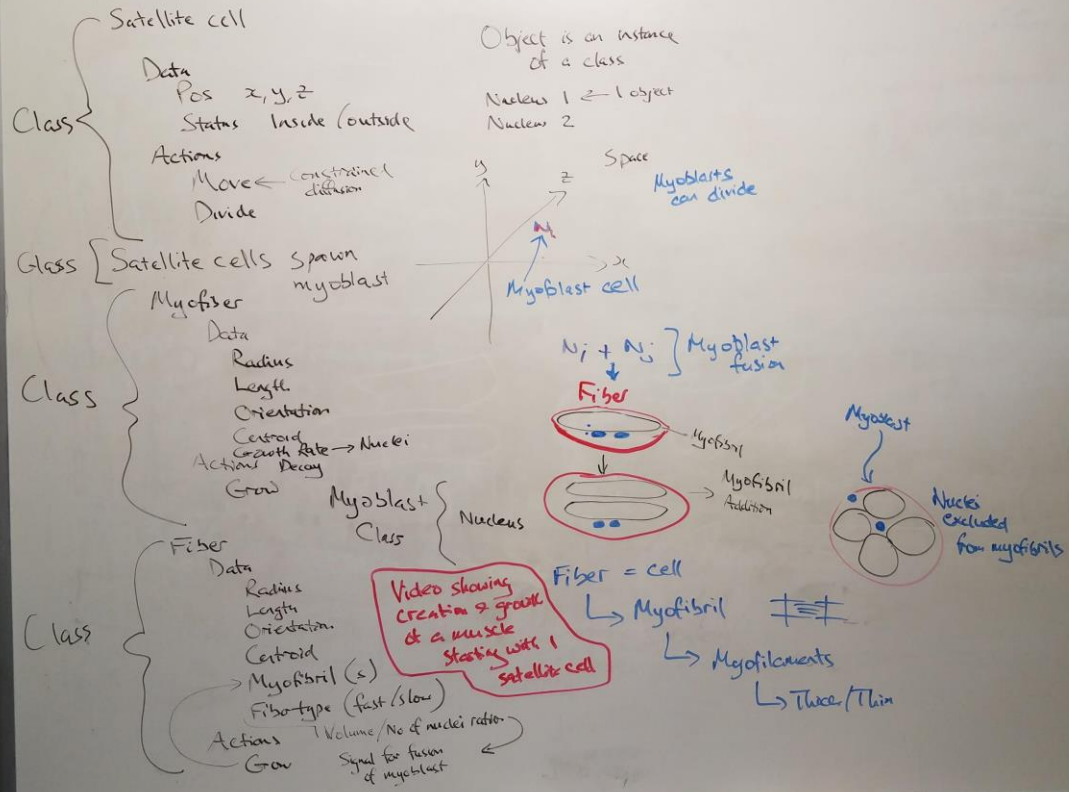
<https://www.mathworks.com/help/matlab/examples/creating-the-matlab-logo.html>

<https://netlogoweb.org/>



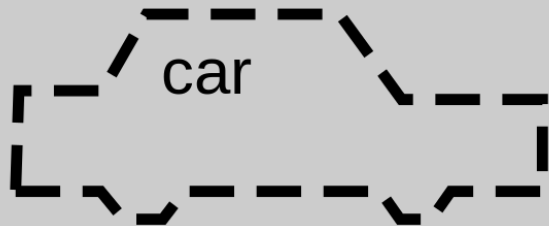
Grant - July 15

## Program that grows a muscle

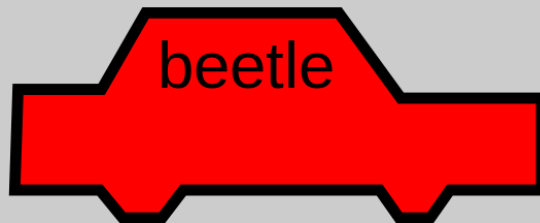
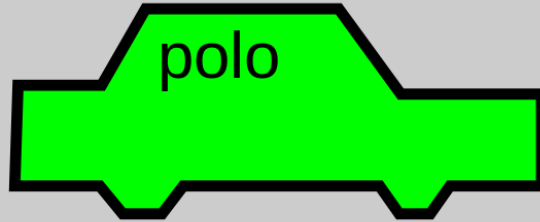


# Bridging the Gap

class



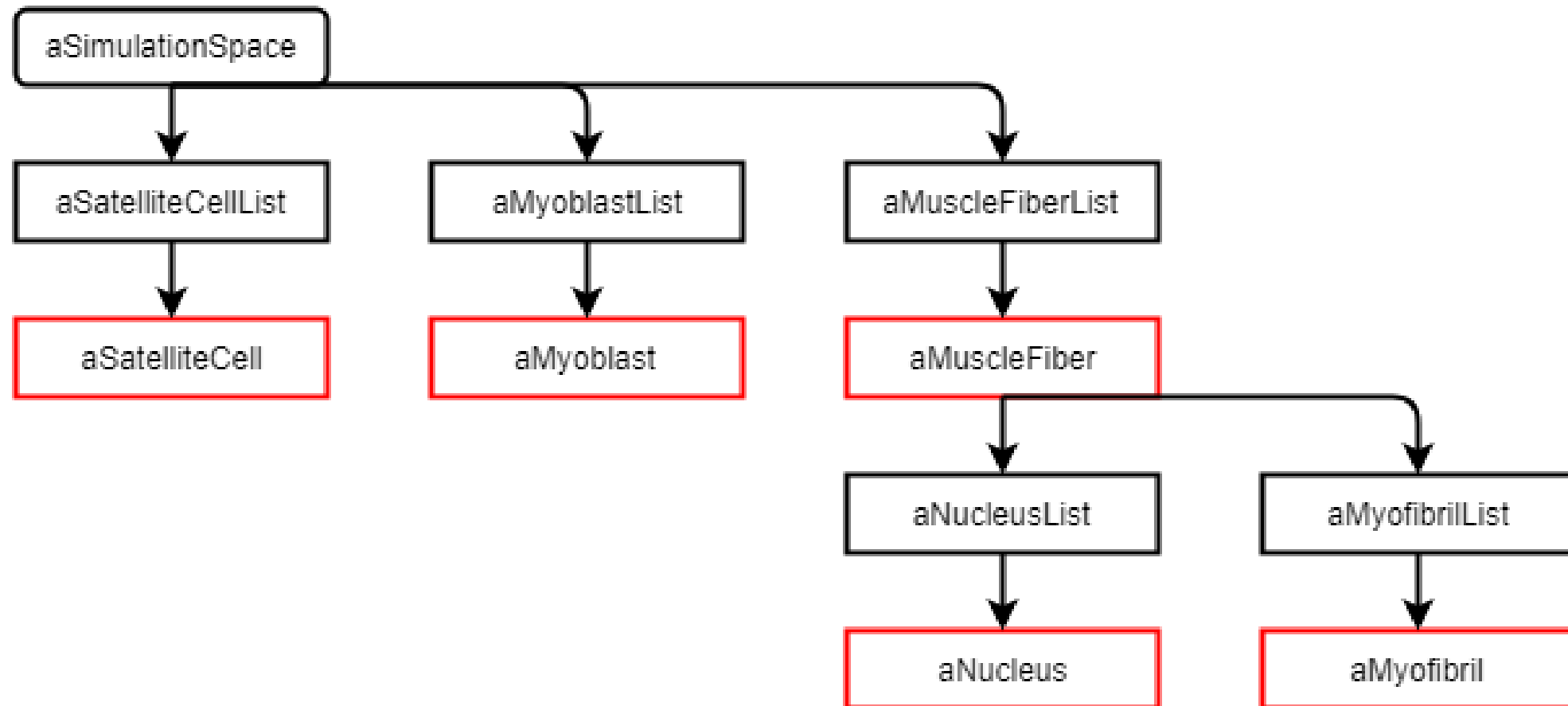
objects



# Classes

# Code Organization

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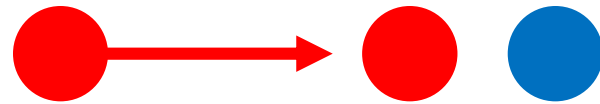
# Satellite Cells

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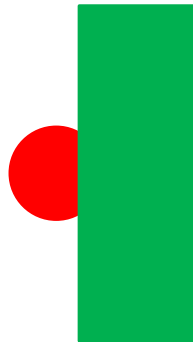
Move



Divide



Stick



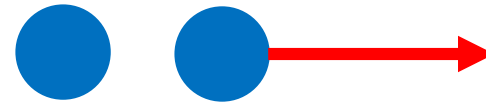
# Myoblasts

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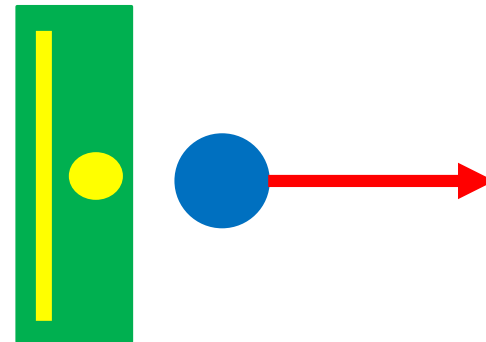
Move



Fuse with myoblasts



Fuse with muscle fibers



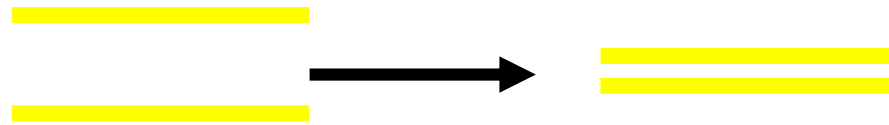
# Myofibrils

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Grow



Pack



Divide



# Nuclei

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Move



# Muscle Fiber

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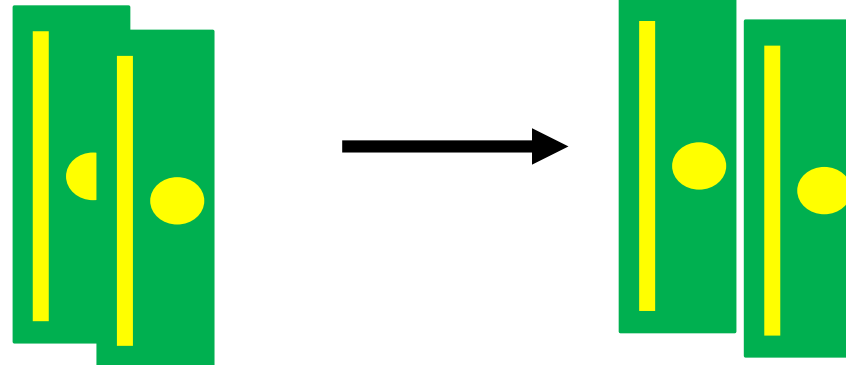
Gets boundary



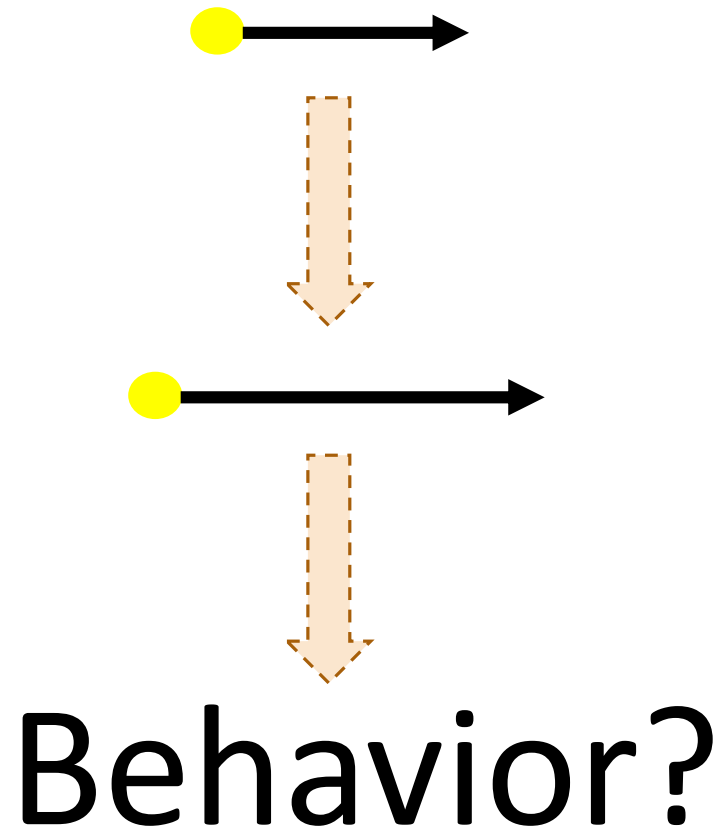
Contains nuclei



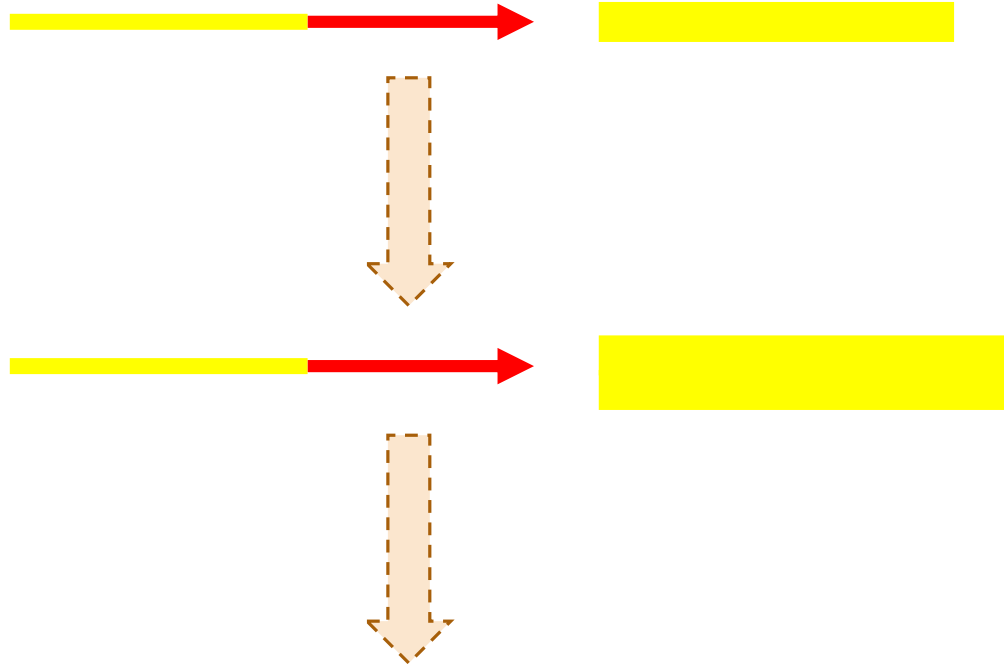
Pushes other fibers





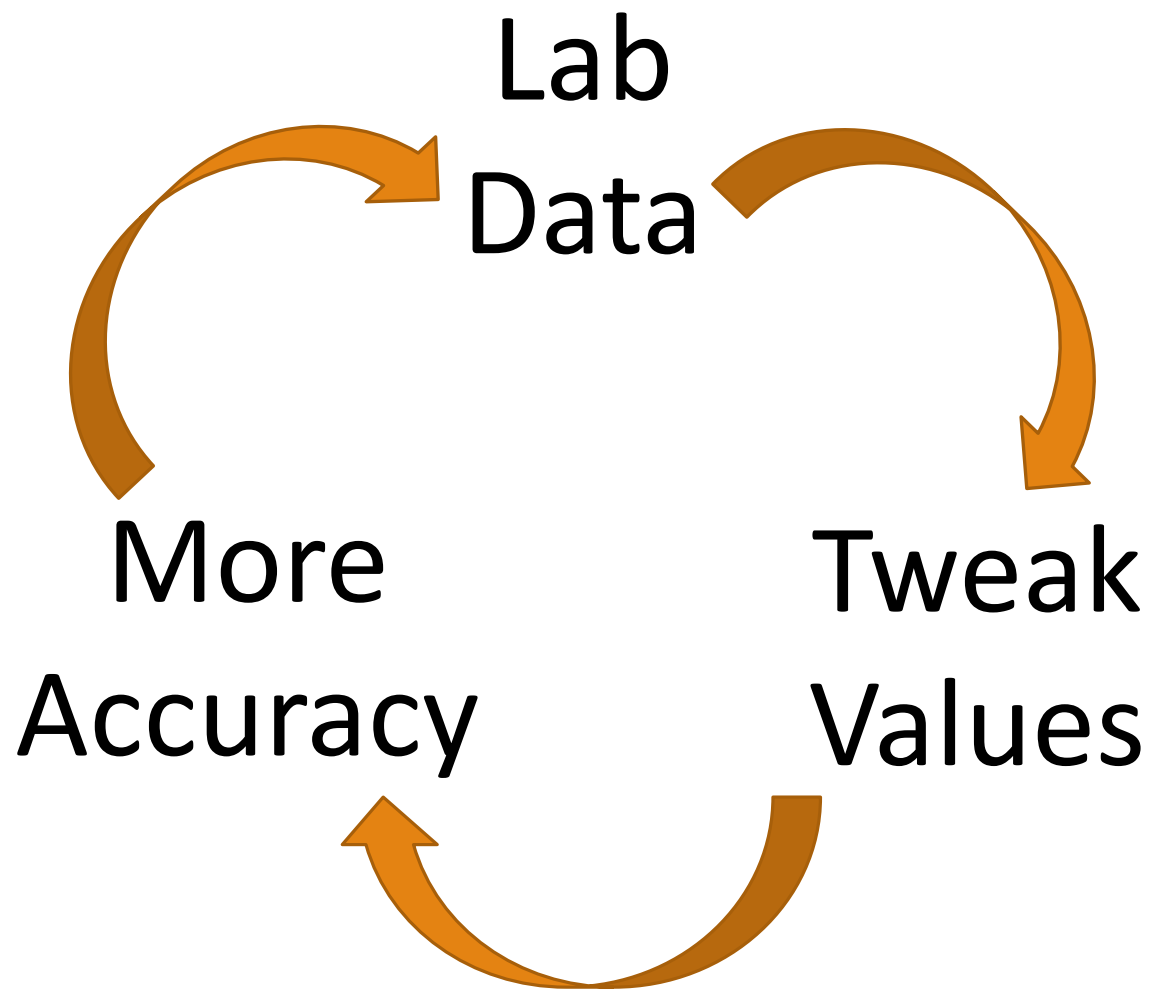


Parameters:  
Changing the  
Simulation



**Behavior?**

Parameters:  
Changing the  
Simulation

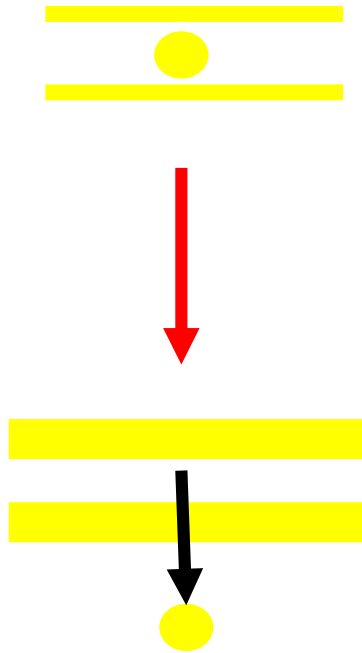


Optimization

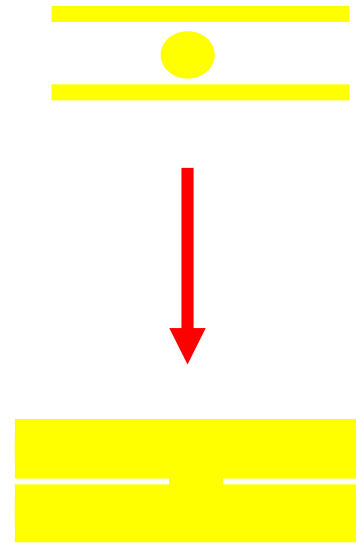
# Example Hypothesis

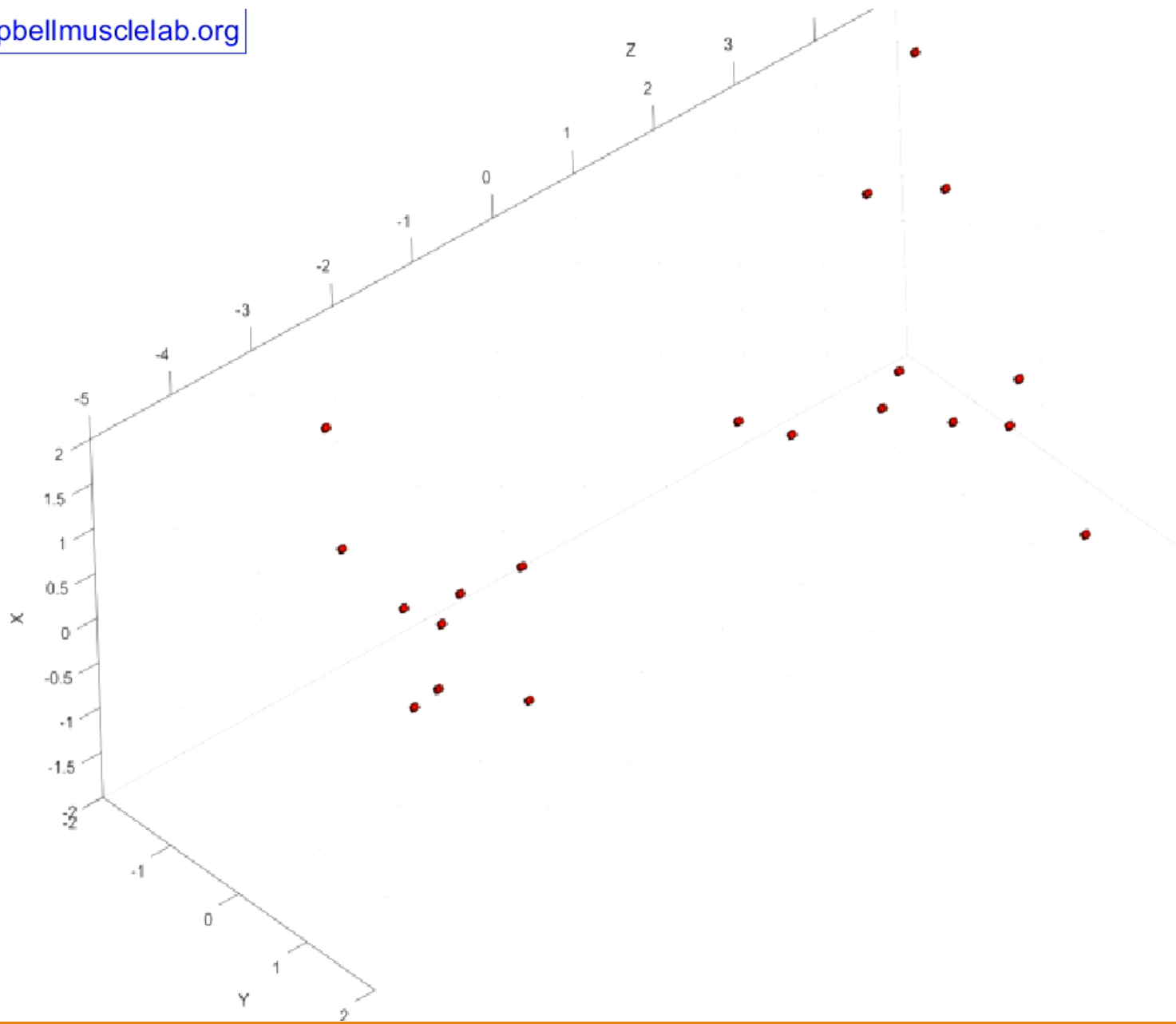
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Fast: Migrates



Slow: Blocked





# Next Steps

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Change constants

Add mechanics

Better data collection

Better parameter setting

Fit model to data

Test predictive capabilities

# Questions?

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# References

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<https://brilliant.org/wiki/classes-oop/>