Photo-Actuation: Determining the Effect of Blue Light on the Actuation of Micro-Beads by Serratia marcescens

Erica Sadler
Biomedical Engineering
Cornell University
Advisor: Dr. Vijay Kumar, PhD
SUNFEST
What is a MicroBioRobot?

A MicroBioRobot can be thought of as two pieces:

1: a Microscopic Device (fluorescent polystyrene micro-beads, 3μm diameter)

2: Flagellated Bacteria (in our case, *Serratia marcescens*)

http://www.polymicrospheres.com/

How Do Flagellated Bacteria Move?

http://openi.nlm.nih.gov/detailedresult.php?img=3000427_pcbi.1001004.g001&req=4
Why Create a MicroBioRobot?

• The small scale
• No external power source
• *Serratia marcescens* are fairly harmless bacteria
Blue Light Results

- Blue light causes *Serratia marcescens* to tumble more frequently
- As a result, the MicroBioRobots moved significantly less when illuminated by blue light