

EE/CprE/SE 491 WEEKLY REPORT 3 - sday18-24

9/17/17 – 9/23/17

Project title: Optical force transducer for visualizing cell mechanotransduction in 3D

Client: LIOS Lab

Advisor: Prof Meng Lu

Team Members/Role:

Quan Wang --- fabrication and process development

Yalun Tang --- fabrication and process development

Jiameng Li --- theory and numerical modeling

Qinming Zhang --- theory and numerical modeling

o Past week accomplishments

- Yalun Tang:
 1. Learned how to use a heater.
 2. Removed the cladding from the fiber by using heater.
 3. Learned and tried to install a connector in the multimode optical fiber.

- Quan Wang:
 1. Removed the cladding layer of the fiber by using the heater
 2. Cleaned the fiber using the fiber optics cleaning kit
 3. Planed the surface chemistry procedure to attach the nanoparticles

- Jiameng Li:
 1. Studied formula with the wave optics from the information that our advisor provided
 2. Create a basic numerical model for the fiber
 3. Cooperating with another group to discuss the problem of technique

- Qinming Zhang:
 1. Test and prepare to use the first multimode optical fiber holder holder(the holder will be used in next stage of experiment).
 2. Design another size holder for single mode optical fiber.
 3. Learned how to use the laser, handling the laser connection in optical fiber.

- Group:

1. Fiber cleaned and all layers has been removed
2. The fiber holder for multimode optical fiber has been made successfully
3. Preparation for the first surface chemistry experiment is done
4. Learned how to use the laser and perform the experiment for next stage(after the installation of connector)

o **Pending issues**

1. We don't have a convenient tool to help us install the connector yet. Therefore, we ordered a tool kit online.
2. The material to print the solidwork model is not available, further detail about the dimension of the fiber holder need to be determined

o **Individual contributions**

Team member	Contribution	Weekly hours	Total hours
Yalun Tang	Removed the cladding, installed a connector to a multimode fiber	5	20
Quan Wang	Removed the cladding layer of optical fiber, planed the surface chemistry procedure	5	20
Jiameng Li	Reading material about fiber, discuss software problem with advisor when modeling specific fiber.	5	20
Qinming Zhang	Test the holder in order to make sure the size is correct.	5	20

o **Plan for coming week**

- Yalun Tang and Quan Wang:
 1. Finish the first trail of surface chemistry
 2. learn how to handle the laser beam instruments
 3. Plan to prepare ten more fibers for nanoparticle attachment experiment

- Jiameng Li and Qinming Zhang:
 1. We will make some change with the parameter of their optical fiber
 2. Simulation in the COMSOL software corresponding to different fiber dimension

O Summary of weekly advisor meeting

In the meeting with the advisor, we reported our accomplished work, and he commented on our cleaned fiber, simulation and Solidwork solutions. Professor Meng suggest us to use fluorescence microscope to observe the cleaned optical fiber. If the optical fiber is not clean enough, the nanoparticle attachment will not succeed because it will not be able to attach on cladding layer of fiber. However, we are familiar with the process of handling optical fiber, and ready to move on to the next stage of the experiment.