

04/08/18 – 04/20/18

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. Repeated the whole experiment (etching + surface chemistry) by using low concentration of AuNP:

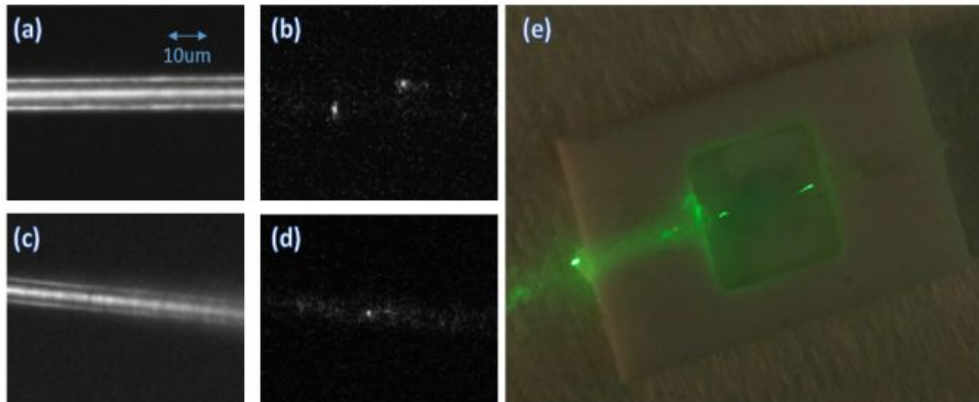


Fig. 5 Experimental results of the near-field coupling between the optical fiber core and gold nanoparticles by using the AuNP solution with the concentration of about 0.25 ug/ml. For (a) to (d), the objective used is 20x. (b) and (d) have the gain of 200 and exposure of 5 ms. (a) The image of the fiber core with about 10 μm diameter from the center part. (b) The image of (a) without the light source. The intensity of the light scattering by AuNP is 3010. (c) The image of the fiber core with about 6 μm diameter away from the center. (d) The image of (c) without the light source. The intensity of the light scattering by AuNP is 5526. (e) The coupling between a laser with wavelength of 532 nm and our optical transducer.

2. Worked on the project poster.

- Quan Wang:

1. Modified the poster
2. Worked on the final project report

- Jiameng Li:

1. We uploaded result of single mode fiber into our poster, and we also add gold nanoparticle around the fiber.
2. Analysing scattering result, drawing intensity tendency line chart into poster.

- Qinming Zhang:

1. Created three samples of etching platform.

o **Pending issues**

1. The etching rate on the fiber is not uniform. The etching rate is the highest at the two ends and lowest at the center. And it causes the etched part become curved (bad for the observation under microscope).

o **Individual contributions**

Team member	Contribution	Weekly hours	Total hours
Yalun Tang	Editing the poster, fiber etching, surface chemistry and gold nanoparticles attachment	50	135
Quan Wang	Modifying the poster, prepare for the final report	20	105
Jiameng Li	Run through the simulation profile to correct minor errors	20	105
Qinming Zhang	Made three more fiber holder to perform experiment	20	105

o Plan for coming week

- Yalun Tang and Quan Wang(fabrication):
 1. Prepare for the final presentation
 2. Prepare the fiber samples for demonstrating the light scattering through laser device
- Jiameng Li and Qinming Zhang(simulation and modeling)
 1. Prepare for the final presentation
 2. Double check the simulation modules and demo it

O Summary of weekly advisor meeting

For this week's meeting, we showed our poster to our advisor, and he gave us some suggestion on showing the poster. Dr. Meng Lu suggest us to show our experiment step by step while presenting our final result, and we should use coverslip to observe our fiber after the gold nanoparticle attachment to stabilize the optical fiber.