

EE/CprE/SE 491 WEEKLY REPORT 6

Start Date 04/07/2019 – End Date 04/12/2019

Group number: sddec19-07

Project title: Rapid detection of Fentanyl using a multifunction nanostructured

Client & Advisor: Meng Lu

Team Members/Role:

Yifu Zhang - Stationary phase fabrication group
Zheyuan Tang - Stationary phase fabrication group
Hao Wang - Testing group
Ugerah Abalu - Testing group
Kossi Egla - Instrumentation group
Olouwole Eteka - Instrumentation group

o Weekly Summary

This week, we began the process of fabricating the photonic sensor. We worked in the lab with a grad student assigned to us by our advisor, Meng Lu, who walked us through an example of the fabrication of the sensor using a silicon wafer. We will continue to work in the lab to become better at fabrication of the photonic sensor and produce more samples.

o Past week accomplishments

Yifu Zhang

1. Analyze the sample solution and its chemical components
2. Learnt the process for making the photonic sensor

Hao Wang

1. Learned the fabrication of the photonic crystal
2. Researched the food dye process for chromatography test

Zheyuan Tang

1. Research the reason that mobile phase not flow on the UTLC plate. And figure out the problem may be the capillary force and hydrophilicity
2. Solve the problem of mobile phase solution unable flow on UTLC plate

Ugerah Abalu

1. Learned more about the fabrication of the photonic sensor
2. Worked on the Design Document

Kossi Egla

1. Still working on the arduino/arducam for the image processing
2. Talk with our advisor (Dr. Lu) about how the photonic sensor will be made

Olouwole Eteka

1. Worked on arduino/arducam code to take a picture
2. Worked on the project plan document

o Pending issues

Failure on the photonic crystal fabrication. When next we are in the lab we will try to decrease the spin time or lower RPM. The 2nd issue we encountered pertains to the length of the time the sample was exposed to UV light. We may need to increase the exposure time

Instrumentation

We need to figure at what angle and how to incorporate the infrared LED in order for the camera to read its reflection from the chromatography sensor.

o Individual contributions

NAME	Individual Contributions	Hours this week	Hours cumulative
Hao Wang	1. Worked on fabrication process of photonic crystal	6	42
Zheyuan Tang	1. Worked on fabrication process of photonic crystal	6	44
Ugerah Abalu	1. Worked with the fabrication team and grad student in beginning the fabrication process of the photonic sensor	6	42
Yifu Zhang	1. Try to learn the fabrication process for photonic crystal with PHD students	6	42
Kossi Eglá	1. Try to save the picture we took from the arduino to the computer 2. Trying to find adequate software to analyse the picture taken from	6	42

	the arduino		
Olouwole Eteka	<ol style="list-style-type: none"> 1. Worked on exporting our picture data to a computer 2. I am learning how to use MATLAB for picture analysis 	6	42

o **Plans for the upcoming week**

Group 1 Fabrication: Zheyuan Tang, Yifu Zhang:

Keep working on the fabricate photonic crystal. Deposit the Titanium dioxide on the photonic crystal. Then check the chromatography process on the photonic crystal.

Group 2 Sample Test: Hao Wang, Ugerah Abalu:

Keep on working with the fabrication group to develop the photonic crystal

Group 3 Instrumentation: Kossi Eglu, Olouwole Eteka:

We need to learn how to use MATLAB to edit a picture and how to break a picture into pixels for analysis. We also need to wire the infrared LED into the system