

EE/CprE/SE 491 WEEKLY REPORT 8

Start Date 04/21/2019 – End Date 04/26/2019

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 worked on revising our project plan. We also began testing using a grated TiO₂ plate. The spotted food dye was moving but not separating properly. As a next step, we will use GLAD to deposit a layer of TiO₂ on the surface of the grating material to see if we get better capillary force to move and separate the spotted food dye

o Past week accomplishments

Yifu Zhang

1. Revise the project plan for the final version
2. Work on the chromatography experiment with dye on the Titanium oxide plastic plate

Zheyuan Tang

1. Made new sample dye and tested it on the photonic crystal which coating with the Titanium dioxide.
2. Try to figure out the way to separate the dye

Ugerah Abalu

1. Worked in the lab to trial run a chromatography experiment using Titanium oxide plate fabricated on plastic as the stationary phase and spotted food dye on the plate.
2. Made the mixture of mobile phase for experiment using a ratio of ethyl acetate, methanol and water

Kossi Egla

1. Worked on how to connect the infrared LED to the arduino.
2. Thinking about the best way to align the infrared LED and the camera

Olouwole Eteka

1. Worked on the infrared LED wiring
2. Sketched the shape of the instrument for future 3D work

Hao Wang

1. tried to figure out how to separate the dye on the grating plastic layer
2. Tested the sample dye on the two different thickness and different oriented grating plastic layers

o Pending issues

Align the grating structure with the direction of placement of the plate to allow for maximum flow and better separation

Instrumentation

We need to figure out the right wavelength at which our camera can read any infrared reflection from the chromatography sensor.

o **Individual contributions**

NAME	Individual Contributions	Hours this week	Hours cumulative
Hao Wang	<ol style="list-style-type: none"> 1. Tested the sample dye on the two different thickness and different oriented grating plastic layers 2. tried to figure out how to separate the dye on the grating plastic layer 	10	58
Zheyuan Tang	<ol style="list-style-type: none"> 1. Test the capillary force on the new grating sample 2. Try to think about how to separate the test sample 	10	58
Ugerah Abalu	<ol style="list-style-type: none"> 1. Helped to prepare new solvent solutions in lab for use in chromatography experiments. 2. Worked on improving and making edits to project plan 	10	58
Yifu Zhang	<ol style="list-style-type: none"> 1. Do the experiment on grating plate 2. Prepare more solvent for next experiment 	10	58

Kossi Eglá	<ol style="list-style-type: none"> 1. Helped design the prototype of the project using solid work 2. Keep working on the arduino and camera for better results 	6	48
Olouwole Eteka	<ol style="list-style-type: none"> 1. worked on the 3D design of our frame. 2. worked on the project plan and the website 	6	48

o Plans for the upcoming week

Group 1 Fabrication: Zheyuan Tang, Yifu Zhang:

Deposit the TiO₂ on new grating sample, and test it by using the dye sample

Group 2 Sample Test: Hao Wang, Ugerah Abalu:

Run a chromatography test on the new grating TiO₂ sample using food dye

Group 3 Instrumentation: Kossi Eglá, Olouwole Eteka:

In the upcoming week we will continue working on the 3D prototype and make some changes inquire by our advisor. We will also test couple of different wavelength infrared LED.