

## **EE/CprE/SE 492 BIWEEKLY REPORT 2**

**Start Date 09/13/2019 – End Date 09/26/2019**

**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

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### **o Weekly Summary**

This week we worked with the graduate student in one of our assigned labs to learn more about principles of diffraction and polarization of light. These are important principles that we will use as we aim to separate and identify colorless fentanyl on a substrate. We also got the ESP 32 Wifi module which will be used in conjunction with connectors to take pictures of the experiment set up

### o Past week accomplishments

#### **Yifu Zhang**

Reviewed what we have done in the last semester. Also, met with the professor to make a plan for this semester in order to improve our test result, and discuss prototype plans

#### **Zheyuan Tang**

Reviewed the experiments and report from last semester. Also, used Silicon dioxide GLAD plate to replace the Titanium dioxide GLAD plate from last semester during the separation stage of chromatography.

#### **Ugerah Abalu**

Worked with ESP32 cam module to ensure proper functionality

#### **Kossi Egla**

Worked on the code the WIFI module needs to function properly.

#### **Olouwole Eteka**

We found out the add on to the ESP32 cam module which is to be integrated on the FTDI board. Also, placed an order for the FTDI board.

#### **Hao Wang**

Learned principle of diffraction and polarization. Repeated the separation test by using the same materials used in last semester for reviewing the separate effects.

### o Pending issues

**Instrumentation (kossi Egla, Olouwole Eteka):** We need to go to the lab to do an experiment to find out the required angle of light reflection on the sensor. Also, our current Arduino is too weak for image processing.

**Fabricaton (yifu zhang, zheyuan tang):** Try to improve the separation by changing the material of our UTLC.

o **Individual contributions**

| NAME         | Individual Contributions   | Hours this week | Hours cumulative |
|--------------|--|-----------------|------------------|
| Hao Wang     | <ol style="list-style-type: none"> <li>1. Look through ppt and articles about optical wave diffraction and polarization</li> <li>2. Try to figure out the position to put the camera</li> </ol>                          | 6               | 64               |
| Zheyuan Tang | <ol style="list-style-type: none"> <li>1. Testing chromatography process on Silicon GLAD plat</li> <li>2. Learning the principles of optical wave diffraction and polarization</li> </ol>                                | 4               | 68               |
| Ugerah Abalu | <ol style="list-style-type: none"> <li>1. Learnt more about principles of diffraction and polarization of light. These principles would be useful in separating and identifying fentanyl from our experiments</li> </ol> | 6               | 64               |
| Yifu Zhang   | <ol style="list-style-type: none"> <li>1. Get more knowledge about optical detection system</li> <li>2. Do more separation experiment make</li> </ol>  | 6               | 64               |

|                |  |   |    |
|----------------|--|---|----|
|                | our separation sensor get improved   |   |    |
| Kossi Eglá     | <ol style="list-style-type: none"> <li>1. Met with Meng LU to discuss about the camera we need for the project</li> <li>2. Order the FTDI board needed to program the camera.</li> </ol> | 6 | 48 |
| Olouwole Eteka | <ol style="list-style-type: none"> <li>1. working on the new dimensions of 3D prototype</li> <li>2. Order the FTDI board to load the code to the WIFI module.</li> </ol>                 | 6 | 48 |

**o Plans for the upcoming week**

**Instrumentation (kossi Eglá,Olouwole Eteka):**

WE need the FTDI board as chanel to load the code on the ESP32 cam module. So we ordered it and expect to receive it early next week. We will test the system when we put them together and take some pictures of the photonic crystal to determine the right distance at which the camera can focus.

**Separation & Testing(Hao Wang, Zheyuan Tang, Yifu Zhang, Ugerah Abalu ):**

Try to rebuild the setup to test the light detection system, and learn how to use it to do observe the result from the chromatography separation.