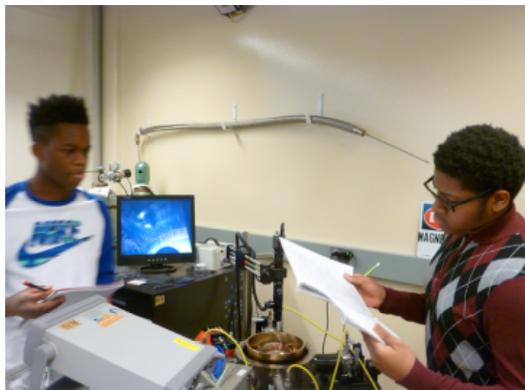


Student Scientists Build Nano-Biosensor to Detect Breast Cancer Cells



Above- left to right: David Whiteside and Damon Rogers reviewing lab during biosensor testing

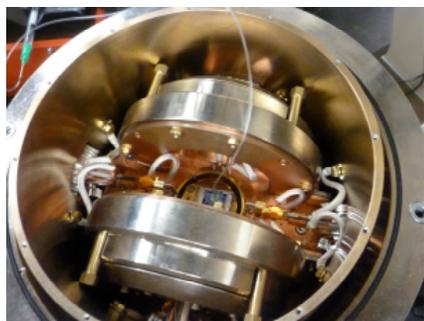
Nanotechnology is a fast growing area in the field of science. Nanomaterials are used to make everything from solar panels to plastics to sensors. Ecotek student research scientists, David Whiteside, 10th grader at Ben Carson High School, Damon Rogers, 12th grader at Detroit Edison Public School Academy and Amber Young, 11th grader at Cranbrook-Kingswood School, spent time in the University of Michigan Lurie Nanofabrication Laboratory to learn how nanomaterials are used to build biosensors that can be used to detect breast cancer.

Biosensors have many applications in the medical field. Some include general healthcare monitoring, screening for disease and clinical analysis. Breast cancer is a malignant tumor that starts in the cells of the breast. Signs of breast cancer may include a lump in the breast, a change in breast shape and dimpling of the skin.

The student scientists worked with graduate students at the University of Michigan Nanofabrication Lab to build a field-effect transistor (FET), a type of transistor commonly used for weak-signal amplification (for example, for amplifying wireless signals). The device can amplify analog or digital signals. It can also switch DC or function as an oscillator. In the FET, current flows along a semiconductor path called the channel.

Prior to starting their lab work the students conducted background research on the application of sensor technology in a variety of areas. They also spent time learning about cancer biomarkers and molecular fingerprint. The nano-sensor building process included using unique materials such as copper tape, molybdenum disulfide and silicon dioxide wafers. The students used advanced equipment at the nanofabrication lab to apply conductive circuitry to the surface of silicon dioxide substrate using a process called photolithography. The students used electrical pulses and UV light to test their prototypes.

Completing this project provided David, Daman and Amber with a glimpse into how experts from the material science and life science fields can work together to build a device to address a problem in society. It also gave the students confidence in their skills and scientific capacity.



Biosensor testing equipment



Amber Young preparing surface of biosensor with polystyrene adhesive



David Whiteside testing biosensor

About the Ecotek Science Program

Ecotek is a science research lab program for young inventors and researchers in grades 5 thru 12. Student scientists work on projects aligned with the issues being addressed by world leaders at the United Nations. To learn more about Ecotek Lab go to <http://www.ecotek-us.com>