Students Travel to Drexel University to Utilize Scanning Electron Microscope

Students analyze the results of their nanotechnology research experiments

Lansdale, Pennsylvania—Students in the North Penn High School Engineering Academy program named The Future is N.E.A.R. (Nanotechnology Education And Research) recently traveled to Drexel University in Philadelphia to work with Dr. Ed Basgall, Manager of Microscopy, to utilize their Scanning Electron Microscope, or SEM for short.

Image 1: 5th Period Engineering Design and Development class in front of SEM with Dr. Ed Basgall, Manager of Microscopy at Drexel University.

Image 2: Students working with Dr Basgall on the SEM

A Scanning Electron Microscope is a tool which allows its users to observe objects at an extremely high magnification utilizing a high energy, focused beam of electrons under vacuum.

During their visit, the students captured highly magnified views of their electrospun nanofibers (20,000x and higher) to identify surface characteristics and to plot diameter measurements. Most of the students' nanofibers measured less than 200 nanometers! To put this scale into perspective, a nanometer is one billionth of a meter (1 $x10^{-9}$ meters) and the average human hair is around 75,000 nanometers. The polymer nanofibers that the students created were so small that they could not bee seen individually with the naked eye; they could only be seen with the aid of the SEM at Drexel University.

The data that the students collected has proven to be useful for the students' statistical analysis. Preliminary reports from their research are showing some promising conclusions and several of the teams have continued their work based upon their SEM observations.

Since early January, the 35 senior students have been working in 15 research teams designing and performing research in the following areas: Photochromic and thermochromic nanofibers (They have already proven a UV response), antibacterial nanofibers (They are working with a biotechnology professor to test their fibers' antibacterial performance), Hydrogen Fuel Cell membranes (Working with a professor at Drexel University to test their membranes), Piezoelectric nanofibers and actuators (already proven a piezo response), Hollow nanofibers for drug delivery and therapy (in process), Thermal and acoustic properties of nanofibers (in process - designing test apparatuses), and a portable electrospinning device for emergency response personnel to quickly apply an artificial, biocompatible nanofiber coating (second skin) to accident victims with severe skin lacerations. (Proven to produce a nanofiber web with only two 9 volt batteries!) And many more.

To read more about nanotechnology, the research the students are performing or if you have any questions, please visit the website at: http://www.thefutureisnear.org

THE FUTURE IS ... N.E.A.R. NANOTECHNOLOGY EDUCATION AND RESEARCH www.thefutureisnear.org

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