Students Travel to Drexel University to Utilize Scanning Electron Microscope

Students Get a Glimpse Into The World of the Unseen

Lansdale, Pennsylvania—February 13, 2008—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 Dee Breger, Director of Microscopy, to utilize their Scanning Electron Microscope, or SEM for short.

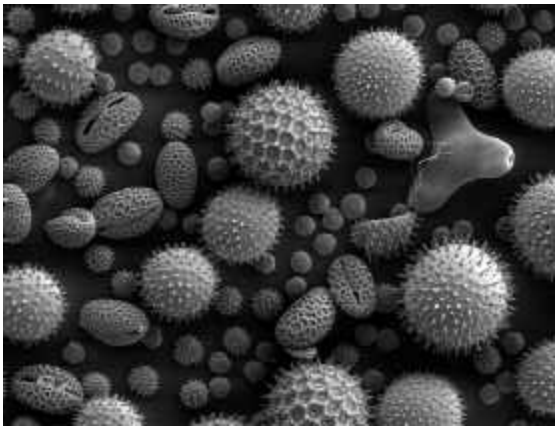

Image 1: Pollen from a variety of common plants (Magnification: 500x)

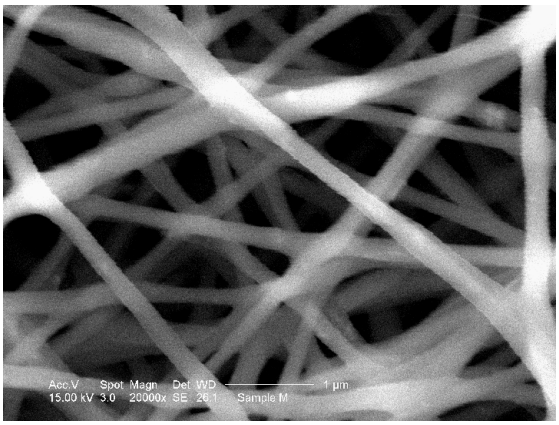

Image 2: Student Crested Polyethylene Oxide Nanofibers (Magnification: 20,000x)

A Scanning Electron Microscope is an electron microscope which allows it's users to indirectly observe objects at an extremely high magnification utilizing a high energy, focused beam of electrons under vacuum.

Image 1 directly to the left shows what common pollen looks like under the magnification of an SEM. This image was taken at only 500X.

Ms. Breger demonstrated and taught the major functions of the Drexel SEM to the engineering academy students just before she allowed them to take over its operation. 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! (See image 2) 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 will prove to be useful when the students return to school to begin their statistical analysis. Preliminary reports from the students' research are showing some promising conclusions and two students may have developed a mathematical model that can be utilized to predict fiber characteristics before the electrospinning process even begins. Further examination of the results will need to be made by the students before any final conclusions can be drawn.

There are many applications for polymer nanofibers, such as: highly selective particulate filters, biomedical applications for cell scaffolding and cell growth, optic nerve regeneration, counterfeit applications, etc. The students will soon be designing experiments to try to create magnetic and conductive fibers as well as fibers with select surface characteristics for various applications.

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

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