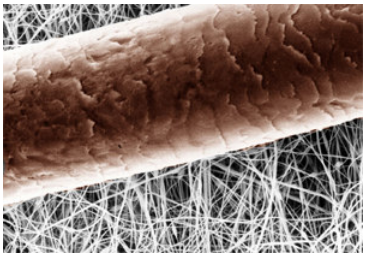
North Penn High School Students Enter the World of Nanotechnology

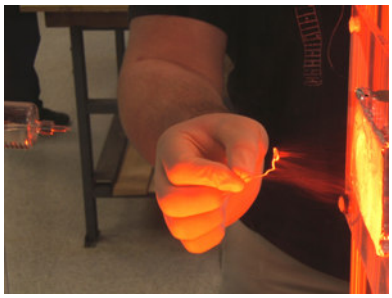
Students begin electrospinning experiments to create polymer nanofibers

Lansdale, Pennsylvania—December 7, 2007—Students in the North Penn High School Engineering Academy program named The Future is N.E.A.R. (Nanotechnology Education And Research) recently began conducting experiments in nanotechnology by researching, designing and performing experiments utilizing a process called electrospinning where their ultimate goal is to produce polymer fibers that are in the nanometer diameter range.

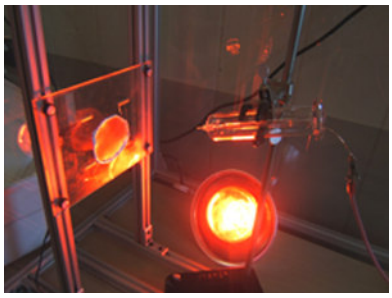
A nanometer is one billionth of a meter (10^{-9} meters). The average human hair is 100,000 nanometers wide. The fibers the students are electrospinning are less than 250 nanometers wide. The picture to the right represents a human hair in relation to polymer nanofibers.



Electrospinning is a process by which a high voltage electrical charge (1,000 – 30,000 Volts) is applied to a viscous polymer solution. The resulting fiber stream or jet creates fibers that are so small they can not be seen individually without the aid of a high magnification instrument such as a scanning electron microscope.



The students are currently working in research teams that focus upon changing the variables within the electrospinning process such as the polymeric properties (weight percentage, molecular weight), field strength (voltage [1000 to 30,000 Volts] and distance of the charged solution and the grounded collection plate), station apparatus (polymer syringe angle, collection plate material), environmental factors (temperature, humidity, etc.) and many other factors. The students are now becoming familiar with many of the parameters in their informal experiments before they begin designing their own experiments.



With the aid of a recently awarded grant from the North Penn Education Foundation, the students will now have the ability to assess the affects that polymer viscosity will have on their experiments**.**

When the students complete much of their electrospinning experiments this year, they will begin to formulate conclusions to their research by working with Dee Breger, Director of Microscopy in the Drexel Nanotechnology Institute (DRI) at Drexel University in Philadelphia, to utilize their Scanning Electron Microscopes. The students, under the direction of Dee Breger, will be taking control of the scanning electron microscopes to take highly magnified views of their fibers (20,000x and higher) to identify surface characteristics and diameter measurements of their electrospun nanofibers.

The Future is N.E.A.R. program began during the 2005-2006 school year from several grants awarded to the program from Toyota, ING Financial, Dominion and Toshiba.

About The Future is N.E.A.R.

The Future is N.E.A.R. program (Nanotechnology Education And Research) is the only high school program of its kind in the world to teach engineering and nanotechnology research through a polymer nanofiber production process known as electrospinning to high school students.

The program offers the students of North Penn High School's Engineering Academy an opportunity to gain 21st century skills that will help prepare them to become successful and highly marketable leaders in the new, technological global society. The program

introduces the fundamentals of nanotechnology, engineering research, and higher level thinking and application of knowledge to high school students while cultivating their interest in engineering, problem solving and life-long learning.

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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