Poster Competition Announced

It's time to start thinking about the annual AATCC Materials Research Poster Competition. Despite the long name, the concept is pretty simple:

- Do research
- Submit a digital poster
- Win up to US$1,000

Past winners have presented everything from high-tech sportswear to biomedical devices. Get inspired by viewing these winning entries on the competition home page.

You must send an initial abstract by February 13, 2012. The final poster is due March 30. Group projects are welcome. Entries are submitted digitally—no need to print or ship your forms or poster.

With two cash prizes in each of three focus areas, you have a great chance of winning fame AND fortune for your idea!

www.aatcc.org/students/materials

New Student Chapter Formed

On August 24, the AATCC Board of Directors officially approved formation of a student chapter at the Advanced Academy for Development of Textile Technologists (AADTT) in Mumbai, India.

The 18 founding members of the group were "eager to form an AATCC student chapter." They explained, "…we would like to be a part of this historical association. By joining the Association and forming the chapter we would like to have first-hand knowledge of standards development, access to technical materials and other programs, and also get a chance to participate in AATCC-organized competitions and scholarships."

Funded Research Complete

Each year, the AATCC Foundation provides grants to support several student research projects. Here, 2011 grant recipients provide updates on their work.

Ming Zhang , University of Georgia

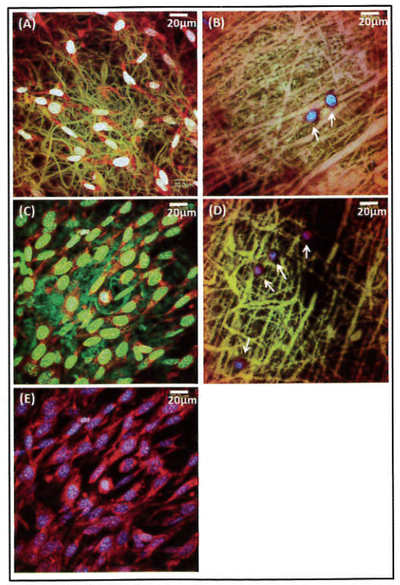
Facile and Low Cost Method to Create Graphene-Composite Textiles

Graphene has similar properties to carbon nanotubes, but with much better prospects for lower costs. In this research, we used fibers and fabrics as templates to form graphene sheets of micron size in two dimensions, while maintaining the nano thickness in the third dimension. This was done by coating the fibers and fabrics with a graphene/pyrene-derivative suspension, and then annealing the coated material in a quartz tube furnace. The annealing at high temperature fused the graphene segments together and created the film around the fibers in the fabric. One of the challenges was to maintain the integrity of the underlying textile in this process. We have done several experiments with positive results and are confident that this approach has much promise. Due to the seamless structure of graphene layer on the fibers, the novel nanomaterial is endowed with excellent electro-conductivity and flexibility. This novel material has the potential to greatly expand textile applications in electronics and energy storage, as well as provide interesting capabilities for "smart" garments.

Qiuran Jiang, University of Nebraska-Lincoln

Water-stable and Biocompatible Electrospun Nonwoven Matrices from Collagen

Although electrospun collagen fibers are promising for biomedical applications, the current solvent systems for collagen electrospinning are composed of toxic chemicals or require high amounts of salt. In addition, electrospun collagen fibers have low strength and insufficient water stability for further medical applications. This research found that the non-toxic ethanol-water solvent and the extender-aided CA crosslinking method could produce electrospun collagen fibers with substantially enhanced dry and wet strengths and maintain their fibrous structure for up to 10 days in phosphate buffered saline at 37°C. Cells on the CA crosslinked electrospun collagen fibers showed better attachment and growth than glutaraldehyde crosslinked collagen fibers and electrospun polylactic acid (PLA) fibers.

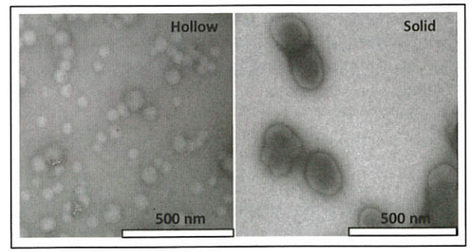


Cell spreading features on collagen electrospun scaffolds.

Yue Zhang, University of Nebraska-Lincoln

Developing Biodegradable Protein Nanoparticles for Sorption of Dyes in Waste Water

The current adsorbents used for waste water treatment have limitations such as low adsorption capacity, poor degradability, or high cost. To solve these problems, biodegradable zein nanoparticles with large surface areas were developed for waste water treatment. The ability of these hollow zein nanoparticles to remove reactive dye from water was investigated under various conditions. The adsorption capacity could reach 967 mg/g at pH 9 with 50 g/L salt. The potential of the zein nanoparticles to serve as an efficient adsorbent for waste water treatment was demonstrated in this research. The effect of temperature and higher initial dye concentrations, as well as the kinetic and equilibrium isotherm analysis, will be studied in our future work.



TEM images of hollow and solid zein nanoparticles.