



Presse Release No. 28/2010

**3rd EuCheMS Chemistry Congress - Chemistry – the Creative Force
August 29 - September 2, 2010, Nürnberg / Germany**

3rd EuCheMS Chemistry Congress in Nürnberg

Innovative Materials Desired Everywhere

One can embark on a discovery trip into the world of synthesis of innovative materials at the 3rd EuCheMS Chemistry Congress to be held in Nürnberg from August 29th until September 3rd. At the opening session there, Professor Dr. Klaus Müllen will introduce the participants to this new world of materials. The director of the Max Planck Institute for Polymer Research in Mainz and vice-president of the Gesellschaft Deutscher Chemiker (German Chemical Society (GDCh)) will report about new functional nanoparticles such as latex particles, structurally stable dendrimers (tree-like branched molecules), surface-functionalized globular proteins, graphene molecules and carbon nanotubes. They can be used in multiple ways, for example, for catalytic reactions, gene transfer and new developments regarding lithium batteries or sensors.

Currently marking a focal point of research, graphenes are nanomolecules consisting of carbon atoms arranged in a two-dimensional structure. The carbon atoms, arranged in a single plane, are each surrounded by three other carbon atoms, thus forming a beehive-like pattern. Because of their physical properties and their high chemical stability, the graphenes are predestined for multiple applications including their use as electrode materials in fuel cells and lithium-ion batteries.

Up to now, the amazingly thin foils could not be mass-produced. In Nürnberg Dr. Xinliang Feng, director of the project group 'Graphite' at the Max Planck Institute for Polymer Research, will introduce a technique to produce graphenes, starting from the inexpensive graphene oxide, in order to make transparent electrodes. Interestingly, this might be applied for organic photovoltaic systems and organic field-effect transistors.

At the Max Planck Institute for Polymer Research, Dr. Dariush Hinderberger is directing the project 'ESR-Spektroskopie und Non-covalent Interactions in Soft Materials'. By applying

electron spin resonance spectroscopy, he and his colleagues mainly wish to study heat-sensitive, branched polymer materials that specifically react to temperature changes. These hydrogels have a huge potential with respect to microanalysis (probes, lab-on-a-chip), the targeted release of active ingredients as well as surface modifications. But what exactly happens when the material properties change at certain temperatures. How does the material structure change? As Hinderberger will point out in Nürnberg, only upon answering this question can researchers tailor such hydrogels to the respective applications.

Also in the field of medicine, many scientists are seeking innovative materials based on polymers. At the Nürnberg congress, the chemist Dr. Karen Lienkamp, who is currently doing her habilitation at the University of Freiburg, will introduce her research work that she recently performed as a postdoctoral fellow at the University of Massachusetts. There the researchers have looked for new polymer materials that can combat multiantibiotic-resistant bacteria. Regarding this, Lienkamp studied synthetic imitations of antimicrobial peptides (SMAMPs) which can be applied where there is a high risk of infection, namely in nursing homes and hospitals, in particular, to fight the multiantibiotic-resistant 'superbugs' such as *Staphylococcus aureus* (MRSA) that may populate medical instruments or infect patients during implantation surgery. Exactly like the natural antibiotic-acting peptides, the SMAMPs, with their positive charges, have to be able to first come into contact with the bacterial cell membrane and then, with the aid of the hydrophobic groups in the molecule, destroy the bacterial cell membrane. The SMAMPs are small polymers whose behavior can vary depending on their particular starting monomer, molecular weight as well as the molecular surface structure and targeted bacteria. Dr. Lienkamp has found favorable SMAMP candidates to contain MRSA-infections.

The most important European chemistry congress, the EuCheMS Chemistry Congress, is being sponsored by the European Association of Chemical and Molecular Sciences (EuCheMS) which, in this year, is expecting about 3,000 participants. As of August 17th, the host and main organizer, the German Chemical Society (Gesellschaft Deutscher Chemiker (GDCh)) and the second-largest EuCheMS member society, could already register about 2,400 participants from more than 60 countries. Under the motto "Chemistry—The Creative Force", the congress is expecting current research results from all the important partial areas of chemistry. Especially pronounced are topics with societal relevance such as innovative materials, raw materials and sustainability, molecular life sciences as well as catalysis.

Frankfurt a.M., 19.08.2010