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EuMelaNet@work : Members bring melanins to the fore in materials science at E-MRS 2012 SPRING MEETING

The European Materials Research Society (EMRS) was founded in 1983 and stands today as one of the leading scientific organizations in Europe on materials science and applications (for additional information see the official site:

http://www.emrs-strasbourg.com/index.php?option=com_frontpage&Itemid=1)

The society has today more than 3,200 members from industry, government, academia and research laboratories, who meet regularly to debate recent technological developments of functional materials. The E-MRS aims at encouraging scientists, engineers and research managers to exchange information on an interdisciplinary platform, and by recognizing professional and technical excellence by promoting awards for achievement from student to senior scientist level.

Each year, E-MRS organizes, co-organizes, sponsors or co-sponsors numerous scientific events and meetings. The major society conference, the E-MRS Spring Meeting, is organized every year in May or June and offers on average 25 topical symposia. It is widely recognized as being of the highest international significance and is the greatest of its kind in Europe with about 2,500 attendees every year.

The 2012 E-MRS Spring Meeting was held at the Congress Center – Strasbourg (France) and was a considerable success. Main themes included:

- **Materials for Energy**
- **Bio / Organic / Polymeric Materials**
- **Materials for Electronic / Photonic / Plasmonic**
- **Advanced Materials and Nano Materials**
- **Methods and Analysis**

In line with the general mission of promoting melanin research at interdisciplinary levels, members of the EuMelaNet special interest group and their colleagues actively participated in the Strasbourg meeting and presented their latest results on melanins to the broad biomaterials community attending the various symposia.

At Symposium I, **"Biological applications for organic electronic devices"**, held on May 15, Clara Santato and coworkers, Julia Wünsche and Federico Rosei, reported on the "**Behaviour of hydrated eumelanin thin films under electrical bias".**
By using a combination of electrical transient measurements in planar two-electrode configuration, Atomic Force Microscopy, and Fluorescence Microscopy they were able to observe a complex behaviour of eumelanin films deposited from dimethyl sulfoxide (DMSO) solutions under applied electrical bias (1V), in 80% relative humidity conditions. This behaviour, depending on the water content and residual DMSO content in the film, included such phenomena as mass transfer and electrochemical reactions, whose products show fluorescence activity and involve the growth of dendrimer structures within the few micron interelectrode distance. The authors emphasized the need for both a combination of advanced techniques and well-controlled experimental conditions to get a better understanding of the charge transport properties of eumelanin for device applications.

Alessandro Pezzella then talked about "**Tailoring eumelanin-inspired biopolymers for organoelectronics: emerging strategies for structure control and film deposition in device setup.** In a previous paper by the Naples group [Bloisi et al., J. Appl. Phys. (2011)] it was shown that it is possible to overcome solubility and heterogeneity issues in producing a eumelanin thin film on quartz using MAPLE technique. Now, Pezzella illustrated the results obtained changing laser pulse repetition rate and examined the effects of substrate temperature (during MAPLE deposition or in a post-annealing stage) on the deposition of melanin thin films.

The ever increasing interest that melanins attract beyond the original boundaries of pigment cell research was well apparent from the lecture by Christopher J Bettinger (Carnegie Mellon University) who provided an overview on "**Soft and Electric: The next generation of medical materials".** After introductory remarks emphasizing how biocompatible and biodegradable materials with advanced mechanical and electrical capabilities have the potential to serve as the centerpiece for medical devices in the future, the talk focused on the emerging potential of melanin-inspired organic semiconductors in a biodegradable format for use in electronically active absorbable medical implants.

Clearly, the way toward a full appreciation of melanins' potential for applications in biomedicine and technology is still long. It is hoped however that the strenuous efforts by the EuMelaNet members, with the encouraging support of the ESPCR, will soon materialize into novel concepts and advances of strong social, economical and biomedical impact. Synergism with other scientific and technologically-oriented communities is thus expected to drive progress in this area in the coming years.