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ABSTRACT DEADLINE: NOVEMBER 1, 2005

REMINDER: In fairness to all potential authors,
late abstracts will not be accepted.

MRS Symposium CC: Electrobiological Interfaces on Soft Substrates

The integration of electronic devices with living or biological components offers the promise of unprecedented novel systems. However, **interfacing solid-state devices** with *biospecimens* such as proteins, cells, or tissues, either *in vivo* or *in vitro*, remains a considerable challenge and yet an impediment to producing fully integrated bio-electronic systems.

The great challenge for these interfaces is that they must be biocompatible on multiple levels. For example, electronic components must be compatible with the harsh aqueous ionic environment necessary for biological activity. Device micro/nanofabrication methods and materials must not denature proteins or poison cells. Surfaces may need to be functionalized for adhesion of proteins or with biological adhesion factors to ensure cellular contact. Consideration of the mechanical interface may be important, as well, for preventing shear or stress concentrations at the interface of the typically very stiff materials used in traditional electronics manufacture and the much more compliant biologic materials (proteins, cells, or tissue). Furthermore, the interface must allow for sufficient coupling of signal transfer (electrons, ions, and photons) over long-time scales without drift.

Plastic electronics, i.e., inorganic/organic devices on compliant plastic or even elastic substrates, offer promising opportunities to overcome these challenges and improve the biocompatibility between electronic devices and biologics.

Relevant submissions to this symposium will detail the various strategies to overcome **soft-hard interface** challenges and other hurdles to improve the interface between electronic and biologic components in hybrid devices.

Topics of interest include, but are not limited to:

Biological Sensing on Soft Substrates

- Polymer-based biosensors
- Biosensors on deformable substrates
- Novel surface coatings for electrodes to improve biocompatibility/charge transfer

Electronics on Compliant Substrates for Biological Interfaces

- Plastic electronics and biomedical applications
- Organic electronics on compliant substrates
- Inorganic electronics on compliant substrates

Fabrication and Processing

- Biocompatible micro-/nanofabrication process
- Substrates and materials
- Low-temperature processing
- Printing device materials on biocompatible plastic substrates

Integrated Electrobiological Interfaces

- Sensitive skin
- Optimization of electrode/tissue interface
- Mechanically matched electrobiological systems
- Electronic/optical coupling (capacitive, direct carrier transport, and electrochemical) between the electronic world and the biological molecules/cells/tissues

Invited speakers include: **Daryl R. Kipke** (Univ. of Michigan), **Klaus P. Koch** (Fraunhofer-Inst. für Biomedizinische Technik IBMT, Germany), **Luke Lee** (Univ. of California-Berkeley), **David C. Martin** (Univ. of Michigan), **Arto Nurmikko** (Brown Univ.), **Takao Someya** (Univ. of Tokyo, Japan), and **Dustin Tyler** (Case Western Reserve Univ.).

Symposium Organizers

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