

GENERAL THEME

The interaction of materials and biological systems is emerging as a new frontier in Materials Science and Engineering. The Biology-Materials connection is a fertile field of research with limitless possibilities. The constituents of biological systems are *biological materials* whereas *biomaterials* are synthetic materials developed for and used in the body.

The structures and properties of biological materials have an unmatched breadth and complexity. The structure-property relationships in these materials are only starting to be established at the present time. Present thrusts toward developing novel biomaterials with unique tailored properties and improved biocompatibility are yielding exciting concepts. *Biomimetics* is a newly emerging interdisciplinary field in which lessons learned from biology form the basis for novel material concepts. This new field of biomimetics investigates biological structures, establishing relationships between properties and structures in order to develop methods of processing and microstructural design for new materials. It is giving rise to new materials concepts, including multifunctional and hierarchically-structured materials, and new materials synthesis/processing approaches.

Many properties of biological materials are far beyond those that can be achieved in synthetic materials with present technologies. Biological organisms produce complex composites that are hierarchically organized in terms of composition and microstructure, containing both inorganic and organic components in complicated mixtures. These totally organism-controlled materials are synthesized at ambient temperature and atmospheric conditions. The unique nano and microstructures in biological composites and the resulting properties have been, until recently, unknown to Materials Scientists, but are now beginning to stimulate creativity in the development of future synthetic materials.

The symposium will encompass the following themes:

- Biological materials
- Biomaterials (Bio-implants)
- Biomimetics

ORGANIZERS

Andrea M. Hodge (Lawrence Livermore National Laboratory)
hodge4@llnl.gov
Phone: (925) 424-3715

Lim Chwee Teck (National University of Singapore)
ctlm@nus.edu.sg
Phone: (65) 6874-7801

Richard LeSar (Los Alamos National Laboratory)
lesar@lanl.gov
Phone: (505) 665-0420

Marc A. Meyers (UC San Diego)
mameyers@ucsd.edu
Phone: (858) 534-4719

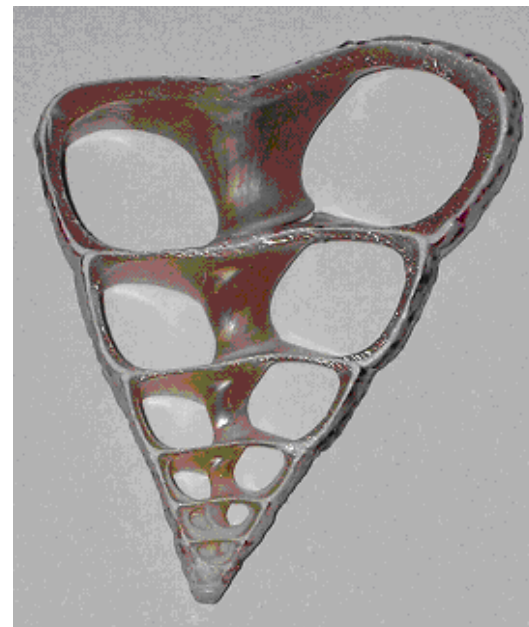
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ABSTRACTS DUE
07/15/2005



**SYMPOSIUM ON
BIOLOGICAL
MATERIALS SCIENCE**

**2006 TMS Annual Meeting
& Exhibition**

**March 12-16, 2006
San Antonio, TX**

SPONSORS

- EMPMD and SMD divisions of TMS
- Mechanical Behavior of Materials (TMS/ASM) and Biomaterials (TMS) Committees

PROPOSED SESSIONS

Session 1: Biological Materials

Session 2: Bioinspired Materials

Session 3: Nanobiomaterials

Session 4: Implant Biomaterials

Session 5: Computational Biomaterials

Session 6: The Biomaterial-Tissue Interface

Session 7: Functional Biomaterials and Devices

LIST OF KEYNOTE AND INVITED SPEAKERS

Note: We will have a good mix of well established Materials Scientists with high TMS visibility and researchers in more specialized areas. We will try to have 3-4 invited talks per session, totaling 18-24 talks. We foresee 30-40 contributed talks.

INVITED KEYNOTE SPEAKERS

- Samuel Stupp, Northwestern University
- Angela Belcher, MIT
- William Bonfield, Cambridge, UK

INVITED SPEAKERS

- Paul Calvert, U. of Massachusetts (Rapid Prototyping to Mimic Biostructures)
- Masaaki Sato, Tohoku University (Cell Mechanics)
- A. G. Evans, UC Santa Barbara (Layered Structures)
- Lorna Gibson, MIT (Bio-cellular)
- G. Mayer, Univ. of Washington (Amorphous Silica)
- Sungho Jin, UCSD (Biology-nano connection)

- Chris Orme, Lawrence Livermore National Lab (Protein Mediated Nucleation and Growth)
- Henry Rack, Clemson (Titanium Alloys for Biological Applications)
- Robert Ritchie, UC Berkeley (Mechanical Properties of Hard Biomaterials: Bone and Teeth)
- M. Sarikaya, Univ. of Washington (Biomimetics; The GEPI Approach)
- Naresh Thadhani, Georgia Tech (Educational issues)
- Morris Fine, Northwestern University (Educational issues)

PROCEEDINGS

We are hopeful that Materials Science and Engineering C will publish proceedings as a separate volume.