

MATERIALS RESEARCH SOCIETY
SYMPOSIUM PROCEEDINGS VOLUME 873

Biological and Bio-Inspired Materials and Devices

March 28 – April 1, 2005
San Francisco, California, USA

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 1-55899-827-6

Some format issues inherent in the e-media version may also appear in this print version.

CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town,
Singapore, São Paulo, Delhi, Tokyo, Mexico City

Cambridge University Press
32 Avenue of the Americas, New York, NY 10013-2473, USA

www.cambridge.org

Materials Research Society
506 Keystone Drive, Warrendale, PA 15086
<http://www.mrs.org>

©Materials Research Society 2027

This publication is in copyright. Subject to statutory exception
and to the provisions of relevant collective licensing agreements,
no reproduction of any part may take place without the written
permission of Cambridge University Press.

First published 2027

CODEN: MRSPDH

ISBN: 3/77: ; /: 49/8

Cambridge University Press has no responsibility for the persistence or
accuracy of URLs for external or third-part Internet Web sites referred to
in this publication and does not guarantee that any content on such Web sites
is, or will remain, accurate or appropriate.

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

- 1 Biosilica Nanofabrication in Diatoms: The Structures and Properties of Regulatory Silaffins**
Kröger, Nils; Poulsen, Nicole
- 7 Blue Luminescent Biogenic Silicon-Germanium Oxide Nanocomposites**
Chang, Chih-Hung; Gutu, Timothy; Jeffryes, Clayton; Jiao, Jun; Liu, Shuhong; Rorrer, Gregory
- 13 Perovskite Particles from Phytoplankton**
Allan, Shawn; Cai, Ye; Gaddis, Christopher; Haluska, Michael; Sandhage, Kenneth; Snyder, Robert; Weatherspoon, Michael
- 19 Small Angle X-ray Scattering, FTIR and SEM Characterization of Nanostructured PVA/TEOS Hybrids by Chemical Crosslinking**
Mansur, Alexandra; Mansur, Herman
- 25 Mechanisms Governing the Inelastic Deformation of Cortical Bone**
Evans, Anthony; Mercer, Christopher; Wang, Rizhi
- 38 The Jaws of Nereis: Microstructure and Mechanical Properties**
Birkedal, Henrik; Broomell, Chris; Khan, Rashda; Lichtenegger, Helga; Slack, Nelle; Stucky, Galen; Waite, Herbert; Zok, Frank
- 44 Enhanced Biocompatibility of GPC by MeV Ion Bombardment**
Gurhan, Ismet; Ila, Daryush; Muntele, Claudiu; Rodrigues, Marcello; Sarkisov, Sergey; Zimmerman, Robert
- 57 Fabrication of Semiconductor Nano-particles in the Protein Cage of Apoferritin**
Iwahori, Kenji; Muraoka, Masahiro; Yamashita, Ichiro; Yoshizawa, Keiko
- 63 Fabrication of Indium Oxide Semiconductor Nano-particles using Ferritin**
Iwahori, Kenji; Okuda, Mitsuhiro; Yamashita, Ichiro; Yoshimura, Hideyuki
- 67 Novel Strategy for Antifouling Paints with Zero Endocrine Disrupting Chemical (EDC) Elution based on Interpenetrating Polymer Networks (IPNs)**
Naito, Masanobu
- 73 Cell Biology, Biochemistry and Genomics of Coccolithophore Biom mineralization**
Gonzalez, Elma; Read, Betsy
- 81 Bio-inspired Design of Modular Multi-domain Polymers for Advanced Biomaterials**
Bai, Jane; Guan, Zhibin; Guzman, Dora; Roland, Jason

- 87 Surface-induced recrystallization of amorphous calcium carbonates to oriented calcite crystals**
Aizenberg, Joanna; Han, Yong-Jin
- 92 The Bio-Nano-Process: Making Semiconductor Devices using Protein Supramolecules**
Yamashita, Ichiro
- 102 Bio-Inspired Evolution of Zinc Oxide-based Materials Directed by Amino Acids and Peptides**
Aldinger, Fritz; Bill, Joachim; Gerstel, Peter; Hoffmann, Rudolf C.; Jeurgens, Lars P. H.; Lipowsky, Peter; Wildhack, Stefanie
- 109 Magnetite-PLGA Microparticles As Potential Oral Delivery Vehicles of Therapeutic Proteins**
Cheng, Jianjun; Farokhzad, Omid; Ho, Dennis; Langer, Robert; Tepley, Benjamin; Yim, Christopher
- 115 Electropermeabilization of Mammalian Cells Visualized with Fluorescent Semiconductor Nanocrystals (Quantum Dots)**
Gundersen, Martin; Kuthi, Andras; Marcu, Laura; Sun, Yinghua; Vernier, P. Thomas; Wang, Jingjing
- 121 Chitosan-alginate Hybrid Scaffolds for in vitro Bone Tissue Engineering**
Li, Zhensheng; Zhang, Miqin
- 127 Blending Polymer of Polysulfone/ Polycaprolactone for Improvement of the Hemocompatibility and for Drug Controlled Release**
Chen, San-Yuan; Liu, Dean-Mo; Liu, Yen-Yu; Tsai, Chia-Hui
- 137 Functionalized Calcium Phosphate-based Nanoparticles for the Treatment of Osteoporosis**
Balasundaram, Ganesan; Sato, Michiko; Webster, Thomas
- 142 Aminopropyl Embedded Silica Films as Potent Substrates in DNA Microarray Applications**
Kiisk, Valter; Kink, Ilmar; Koževnikova, Jevgenia; Kurg, Ants; Lõhmus, Ants; Mäeorg, Uno; Plaado, Margo; Rinke, Ago; Saal, Kristjan; Sildos, Ilmo; Tätt, Tanel
- 148 Nanobiohybrids: Bioinspired Sensors**
Chalkias, Nikolaos; Giannelis, Emmanuel
- 154 Preparation and Characterization of Porous Material from Self-Organized Hydroxyapatite/Collagen Nanocomposite**
Ikoma, Toshiyuki; Kikuchi, Masanori; Monkawa, Akira; Tanaka, Junzo; Yunoki, Shunji

- 160 Fabrication of Coated Polycaprolactone Scaffolds and Their Effects on Murine Embryonic Stem Cells**
Batich, Christopher;Hamazaki, Takashi;Terada, Naohiro;Tollon, Michael;Willenberg, Bradley
- 165 Immobilization of Proteins on the Surface of Silanized Hydroxyapatite**
Ikoma, Toshiyuki;Kumagai, Yuri;Monkawa, Akira;Tanaka, Junzo;Yunoki, Syunji
- 171 Fabrication and characterization of an active matrix thin film transistor array for intracellular probing**
Jun, Seung-Ik;McKnight, Timothy;Melechko, Anatoli;Rack, Philip;Simpson, Michael
- 177 Laser Light Scattering Observations of Liquid-Liquid Phase Separation in a Polymer-Induced Liquid-Precursor (PILP) Mineralization Process**
DiMasi, Elaine;Gower, Laurie;Liu, Tianbo;Olszta, Matthew
- 184 In Situ Characterization of Surface Evolution on Titanium in Hydrogen Peroxide Containing Solutions**
Frangos, John;Gray, Jeremy;McKittrick, Joanna;Muyco, Julie;Orme, Christine;Ratto, Timothy
- 190 A high-throughput crystallization device to study biomineralization in vitro**
Becker, Alexander;Epple, Matthias
- 200 Surface Roughness Values Closer to Bone for Titania Nanoparticle/Poly-lactic-co-glycolic Acid (PLGA) Composites Increases Bone Cell Adhesion**
Liu, Huinan;Slamovich, Elliott;Webster, Thomas