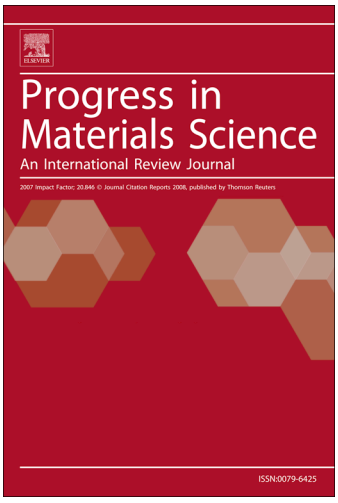

Biotemplated Synthesis of Inorganic Materials: An Emerging Paradigm for Nanomaterial Synthesis Inspired by Nature

Brad A. Krajina, Amy C. Proctor, Alia P. Schoen, Andrew J. Spakowitz, Sarah C. Heilshorn

PII: S0079-6425(17)30100-7
DOI: http://dx.doi.org/10.1016/j.pmatsci.2017.08.001
Reference: JPMS 469

To appear in: *Progress in Materials Science*

Received Date: 22 May 2016
Revised Date: 10 July 2017
Accepted Date: 7 August 2017

Please cite this article as: Krajina, B.A., Proctor, A.C., Schoen, A.P., Spakowitz, A.J., Heilshorn, S.C., Biotemplated Synthesis of Inorganic Materials: An Emerging Paradigm for Nanomaterial Synthesis Inspired by Nature, *Progress in Materials Science* (2017), doi: http://dx.doi.org/10.1016/j.pmatsci.2017.08.001

Biotemplated Synthesis of Inorganic Materials: An Emerging Paradigm for Nanomaterial Synthesis Inspired by Nature

Brad A. Krajina[3], Amy C. Proctor[3], Alia P. Schoen[1], Andrew J. Spakowitz[1,2,3] and Sarah C. Heilshorn[1,2,*]

[1]Materials Science and Engineering, Stanford University, Stanford, California 94305, United States

[2]Stanford Institute for Materials and Energy Science, SLAC National Accelerator Laboratory, Menlo Park, California 94025, United States

[3]Chemical Engineering, Stanford University, Stanford, California 94305, United States

*Address correspondence to:

Sarah C. Heilshorn, Ph.D.
Department of Materials Science and Engineering
Stanford University
476 Lomita Mall
McCullough Room 246
Stanford, CA 94305-4045
E-mail: heilshorn@stanford.edu

Abstract

Biomineralization, the process by which biological systems direct the synthesis of inorganic structures from organic templates, is an exquisite example of nanomaterial self-assembly in nature. Its products include the shells of mollusks and the bones and teeth of vertebrates. By comparison, conventional inorganic synthesis techniques provide limited control over inorganic nanomaterial architecture. Inspired by biomineralization in nature, over the last two decades, the field of biotemplating has emerged as a new paradigm for inorganic nanomaterial assembly, wherein researchers seek to design novel nano-structures in which inorganic nanomaterial synthesis is directed from an underlying biomolecular template. Here, we