



Progress in Bioceramics

Edited by
Maria Vallet-Regí

ttp TRANS TECH PUBLICATIONS

All rights reserved. No part of the contents of this book may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, without the written permission of the publisher.

Progress in Bioceramics

Calcium Phosphate Glass (CPG): Potential as Biomaterial for Hard-Tissue Repair
 P.K. Lee and R.Z. LeGeros 1

Control Use of Dissolutive Glasses for Maxillo-Facial Repair
 J. Thompson and J.L. Hood 24

Hydroxyapatite and Zinc-Substituted Beta-Tricalcium Phosphate as Potential
 Tissue Regenerative Biomaterials
 G. Basso and R.Z. LeGeros 29

Special topic volume with invited papers only

Calcium Phosphate/Biphosphate Combinations: A Review
 of Therapeutic Synergy
 S. Nishii, J.M. Bonet, J. Quachon, Y. Ohnishi and P. Jansen 35

Supporting Implant Fixation and Bone Grafting: Calcium Phosphate
 Gels
 S. Nishii and M. Ishikawa 44

Zinc-Doped Ordered Mesoporous Materials for Medical Applications
 J. Espinosa-Borja, M. Morones, M. Carilla and M. Vallet-Regí 51

Concrete Beams for Design of Biomaterials for In Situ Tissue Regeneration
 A. Hirsch and J.M. Peltz 58

Edited by Maria Vallet-Regí

Cell Proliferation and Tissue Compatibility of Organic-Inorganic Hybrid
 Materials
 T. Egusa, S. Hasegawa and A. Ueda 67

Structure of Mesoporous Microparticles for Pharmaceutical Applications
 J. Anwar, A. López-Noreiga, E. Roca-Henríquez, I. Roca, J.M. González-Cabrija
 and M. Vallet-Regí 71

Control of Drug Release from Calcium Phosphate Cylinders
 by Surface Modification
 T. Yamamoto, M. Yamamoto and M. Yamamoto 78

Controlled Release of Hydroxyapatite Nanoparticles from
 Poly(lactide-co-glycolide) Scaffolds
 J. Anwar, A. López-Noreiga, E. Roca-Henríquez, I. Roca, J.M. González-Cabrija
 and M. Vallet-Regí 85

Controlled Release of Hydroxyapatite Nanoparticles from
 Poly(lactide-co-glycolide) Scaffolds
 J. Anwar, A. López-Noreiga, E. Roca-Henríquez, I. Roca, J.M. González-Cabrija
 and M. Vallet-Regí 92

Controlled Release of Hydroxyapatite Nanoparticles from
 Poly(lactide-co-glycolide) Scaffolds
 J. Anwar, A. López-Noreiga, E. Roca-Henríquez, I. Roca, J.M. González-Cabrija
 and M. Vallet-Regí 99

Controlled Release of Hydroxyapatite Nanoparticles from
 Poly(lactide-co-glycolide) Scaffolds
 J. Anwar, A. López-Noreiga, E. Roca-Henríquez, I. Roca, J.M. González-Cabrija
 and M. Vallet-Regí 106

Controlled Release of Hydroxyapatite Nanoparticles from
 Poly(lactide-co-glycolide) Scaffolds
 J. Anwar, A. López-Noreiga, E. Roca-Henríquez, I. Roca, J.M. González-Cabrija
 and M. Vallet-Regí 113

Copyright © 2008 Trans Tech Publications Ltd, Switzerland

All rights reserved. No part of the contents of this book may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

Trans Tech Publications Ltd
Laubisrutistr. 24
CH-8712 Stafa-Zurich
Switzerland
<http://www.ttp.net>

Volume 377 of
Key Engineering Materials
ISSN 1013-9826
Full text available online at <http://www.scientific.net>

Distributed worldwide by

Trans Tech Publications Ltd.
Laubisrutistr. 24
CH-8712 Stafa-Zurich
Switzerland

Fax: +41 (44) 922 10 33
e-mail: sales@ttp.net

and in the Americas by

Trans Tech Publications Inc.
PO Box 699, May Street
Enfield, NH 03748
USA

Phone: +1 (603) 632-7377
Fax: +1 (603) 632-5611
e-mail: sales-usa@ttp.net

Printed in the Netherlands

Table of Contents

Bioceramics: Where Do We Come from and which are the Future Expectations M. Vallet-Regí	1
Upgrading Calcium Phosphate Scaffolds for Tissue Engineering Applications S. Sánchez-Salcedo, D. Arcos and M. Vallet-Regí.....	19
Calcium Phosphate Glass (CPG): Potential as Biomaterial for Hard-Tissue Repair Y.K. Lee and R.Z. LeGeros	43
Clinical Use of Bioactive Glasses for Maxillo-Facial Repair I. Thompson and L.L. Hench	73
Magnesium- and Zinc-Substituted Beta-Tricalcium Phosphates as Potential Bone Substitute Biomaterials A. Ito and R.Z. LeGeros.....	85
Calcium Phosphates / Biphosphonates Combinations...Towards a Therapeutic Synergy B. Bujoli, J.M. Bouler, J. Guicheux, O. Gauthier and P. Janvier	99
Ensuring Implant Fixation and Sol-Gel Derived Ceramic Coatings S. Areva and M. Jokinen.....	111
Silica-Based Ordered Mesoporous Materials for Biomedical Applications I. Izquierdo-Barba, M. Manzano, M. Colilla and M. Vallet-Regí	133
A Genetic Basis for Design of Biomaterials for <i>In Situ</i> Tissue Regeneration L.L. Hench and J.M. Polak	151
Cell Proliferation and Tissue Compatibility of Organic-Inorganic Hybrid Materials K. Tsuru, S. Hayakawa and A. Osaka.....	167
Synthesis of Mesoporous Microparticles for Biomedical Applications D. Arcos, A. López-Noriega, E. Ruiz-Hernández, L. Ruiz, J.M. González-Calbet and M. Vallet-Regí.....	181
Rationale of Using Conventional Sol-Gel Derived SiO₂ for Delivery of Biologically Active Agents M. Jokinen, M. Koskinen and S. Areva	195
A Combined Experimental-Computational Strategy for the Design, Synthesis and Characterization of Bioactive Zinc-Silicate Glasses G. Lusvardi, G. Malavasi, L. Menabue and M.C. Menziani.....	211
Simulation of Bone Remodelling and Bone Ingrowth within Scaffolds J.A. Sanz-Herrera, J.M. García-Aznar and M. Doblaré.....	225
Author Index	275
Keyword Index.....	277