



Strasbourg (France)

E-MRS 2005 Spring Meeting
May 31 – June 3, 2005

SYMPOSIUM H

Nano-structured and intelligent bioactive materials

Symposium Organizers :

Roberto Doddoli, BIOFUTURE Research Consortium
c/o University of Bari, Italy

Dieter Falkenhagen, Donau University, Krems, Austria

J.C. Kirkpatrick, Johannes Gutenberg University, Mainz, Germany

Andreas Lendlein, GKSS Research Center, Teltow, Germany

Papers to be published in Biomolecular Engineering

E-MRS 2005 Spring Meeting

SYMPOSIUM H

Tuesday, May 31, 2005
Mardi 31 mai 2005

Morning
Matin

9:00 **WELCOME**
 by Roberto Doddoli

Session I
Session chair : Dominique Muster

- H-I.01** 9:10 **NANOCOMPOSITES BASED ON POLY-d,l-LACTIDE AND MULTIWALL CARBON NANOTUBES**
L.P. Krul,, A.I. Volozhyn, D.A. Belov, N.A. Poloiko, A.S. Artushkevich, Belarus State University, 14 Leningradskaja st., 220050 Minsk, Belarus, S.A. Zhdanok, Heat and Mass Transfer Institute, 15 Brovki st., 220072 Minsk, Belarus, A.P. Solntsev., A.V. Krauklis, I.A. Zhukova, Belarus
- H-I.02** 9:30 **DEVELOPMENT OF POLYMER BASED SENSORS FOR INTEGRATION IN A WIRELESS DATA ACQUISITION SYSTEM SUITABLE FOR MONITORING ENVIRONMENTAL AND PHYSIOLOGICAL PROCESSES**
K. Arshak(a), A. Arshak(b), D. Morris(b), O. Korostynska(a), E. Jafer(a), J. Harris(a), (a)Dept. of Electronics & Computer Engineering, University of Limerick, Limerick, Ireland, (b)Dept. of Physics, University of Limerick, Limerick, Ireland
- H-I.03** 9:50 **COMPETITIVE PROTEIN ADSORPTION ON MICRO PATTERNED POLYMERIC BIOMATERIALS, AND VISCOELASTIC PROPERTIES OF TAILOR MADE EXTRACELLULAR MATRICES**
Alexander Welle, Institute for Biological Interfaces, Forschungszentrum Karlsruhe, P.O. Box 3640, 76021 Karlsruhe, Germany, Antonio Chiumiento, Rolando Barbucci, CRISMA Department of Chemical and Biosystem Sciences and Technologies, University of Siena, Via A. Moro 2, 53100 Siena, Italy
- H-I.04** 10:10 **BIOMIMETIC IMPLANT COATINGS**
E. Eisenbarth, D. Velten, J. Breme, Germany
- H-I.05** 10:30 -Invited- **MICRO-AND NANOSTRUCTURED MATERIALS FOR EXTRACORPOREAL BLOOD PURIFICATION**
D. Falkenhagen(a), F. Loth(a), V. Weber(a), M. Sara(b), U. Sleytr(b), (a)Christian Doppler Laboratory for Specific Adsorption Technologies, Danube University Krems, (b)Centre for Nanobiotechnology, University of Natural Resources and Applied Life Sciences, Vienna, Austria
- H-I.06** 10:50 **SYNTHESIS OF POLYMER/CARBON NANOTUBE COMPOSITES FOR BIOMEDICAL APPLICATIONS**
Ramesh babu.P(a), W. Blau(a), E. Titus(b), N. Ali(b), J. Gracio(b), G. Cabral(b), P. Pakonstantinou(c), J. McLaughlin(c) and D.S. Misra(d), (a)Materials Ireland Polymer Research Centre, Trinity College, Dublin-1, Ireland, (b)Department of Mechanical Engineering, University of Aveiro, 3810-193 Aveiro, Portugal, (c)NIBEC, University of Ulster, Newtownanney BT370QB, U.K., (d)Indian Institute of Technology, Bombay 400076, India
- 11:10 **BREAK**

Session II

Session chair : **Andreas Lendlein**

- H-II.01** 11:20 PH-RESPONSIVE VESICLES NANOCAPSULES BASED ON POLYPEPTIDE DIBLOCK COPOLYMERS
J. Rodríguez-Hernández(a), F. Chécot(a), J. Babin(a), Y. Gnanou(a), A. Brûlet(b), J. Oberdisse(c) and S. Lecommandoux(a), (a)Laboratoire de Chimie des Polymères Organiques (LCPO-UMR5629), ENSCPB, University Bordeaux 1, 16 Avenue Pey Berland, 33607 Pessac-Cedex, France, (b)Laboratoire Léon Brillouin (CEA-CNRS UMR12), CEA-Saclay, 91191 Gif sur Yvette Cedex, France, (c)Groupe de Dynamique des Phases Condensées (GDP-UMR5581), Université Montpellier II, Place E. Bataillon, 34095 Montpellier Cedex 05, France
- H-II.02** 11:40 BIOADSORPTION STUDIES ON CARBON NITRIDE FILMS USING IN-SITU ELLIPSOMETRY
T. Berlind, M. Poksinski, L. Hultman, P. Tengvall and H. Arwin, Linköping University, 581 83 Linköping, Sweden
- H-II.03** 12:00 ONE- AND MULTICOMPONENT LB FILMS BASED ON DPPC: PHASE TRANSITIONS AND FILM REORGANIZATION ONTO SOLID SURFACE
G. Zhavnerko, G. Marletta, Laboratory for Molecular Surfaces and Nanotechnology, Department of Chemical Sciences, University of Catania, Viale A.Doria 6, 95125 Catania, Italy
- H-II.04** 12:20 ENHANCED ANTIBACTERIAL AND PHOTOCATALYTICAL PROPERTIES OF FE+3 DOPED TiO2 SOL-GEL THIN FILMS DEPOSITED ON CARBON NANOTUBES
A.R. Phani, L. Lozzi and S. Santucci, INFN and Department of Physics, University of L'Aquila, via Vetoio, 67010 Coppito, L'Aquila, Italy
- H-II.05** 12:40 FABRICATION OF A THREE-DIMENSIONAL NANO-STRUCTURED BIOMATERIAL FOR TISSUE ENGINEERING OF BONE
E. Garreta and D. Gasset, Institut Quimic de Sarria, Via Augusta 390, 08017 Barcelona, Spain, C. Semino, Center for Biomedical Engineering, NE47-383, Massachusetts Institute of Technology, Cambridge MA 02039, USA, S. Borros, Institut Quimic de Sarria, Via Augusta 390, 08017 Barcelona, Spain
- 13:00 **LUNCH**

Tuesday, May 31, 2005
Mardi 31 mai 2005

Afternoon
Après-midi

Session III

Session chair : **Augustinus Bader**

- H-III.01** 14:30 -Invited- NOVEL MEMBRANES AND SURFACE MODIFICATION ABLE TO ACTIVATE SPECIFIC CELLULAR RESPONSES
L. De Bartolo(a), S. Morelli(a), L. C. Lopez(b), L. Giorno(a), P. Favia(b), R.d'Agostino(b) and E.Drioli(a), (a)Institute on Membrane Technology, National Research Council of Italy, ITM-CNR, c/o University of Calabria, via P. Bucci cubo 17/C, 87030 Rende (CS) Italy, (b)Department of Chemistry, University of Bari, Bari, Italy
- H-III.02** 15:00 -Invited- THE CHALLENGE OF BIOLOGICAL TESTING OF INTELLIGENT BIOMATERIALS FOR REGENERATIVE MEDICINE
C.J. Kirkpatrick, REPAIR-Lab*, Institute of Pathology, Johannes Gutenberg University, Langenbeckstrasse 1, 55101 Mainz, Germany
- H-III.03** 15:20 EARLY STAGES OF HUMAN PLASMA PROTEINS ADSORPTION ON BIOCOMPATIBLE THIN FILMS PROBED BY ATOMIC FORCE MICROSCOPE
K. Mitsakakis, S. Lousinian, S. Logothetidis, Aristotle University of Thessaloniki, Department of Physics, 54124 Thessaloniki, Greece
- H-III.04** 15:40 DISC CHONDROCYTE TRANSPLANTATION IN A CANINE MODEL: A TREATMENT FOR DEGENERATED OR DAMAGED INTERVERTEBRAL DISC
H.J. Meisel(a), T. Ganey(b), W. Hutton(c), (a)BG-Kliniken Bergmannstrost, Halle/Saale, Deutschland, (b)Tampa, FL, USA, (c)Emory Spine Center, Atlanta, GA, USA

16:00

BREAK

Session IV

Session chair : **James C. Kirkpatrick**

- H-IV.01** 16:20 -Invited- IS THERE A NANOTECHNOLOGICAL NEED FOR BIOMATERIALS USED IN ORAL AND MAXILLOFACIAL SURGERY?
D. Muster, LEED Biomatériaux & Service de Stomatologie et Chirurgie Maxillo-faciale, CHRU, BP 426, 67091 Strasbourg Cedex, France
- H-IV.02** 16:50 INFRARED ELLIPSOMETRY STUDIES OF TEMPERATURE EFFECTS ON MULTILAYERS OF ANTI-HUMAN SERUM ALBUMIN AND ITS ANTIGEN
H. Arwin, A. Askendahl, T. Berlind, P. Tengvall, Linköping University, 581 83 Linköping, Sweden; T. Tiwald, J.A. Woollam Co., Inc, 645 M St., Suite 102, Lincoln NE 68508, USA; D.W. Thomson, J.A. Woollam, University of Nebraska, Lincoln NE 68588-0511, USA
- H-IV.03** 17:10 THE IMMOBILIZATION OF NANO-STRUCTURED HYDROXYAPATITE SURFACE BY DNA MOLECULES FOR A STIMULATED MINERALIZATION
O. Lysko(a), A. Veligura(a), I.Lysko(a), P. Lytvyn(b), V. Dubok(c), E. Buzaneva(a), (a)National Taras Shevchenko University of Kiev, The Scientific and Training Center "Physical and Chemical Material Science of Kiev National Taras Shevchenko University and NASU", 64 Vladimirska Str., 01033 Kiev, Ukraine, (b)Institute of Semiconductor NANU, Physiks 45, prospect Nauky, 03028 Kiev, Ukraine, (c)Institute for Problems of Material Science NANU, 3, Kryzhanovskogo Str., 03680 Kiev, Ukraine
- H-IV.04** 17:30 POLY(ETHYLENE OXIDE) HYDROGELS AS A TEMPLATE FOR THE CULTURE OF HEPATOCYTES
E. Alexandre J. Cinqualbre(a), D. Jaeck(a), L. Richert(a), P.J. Lutz(b), (a)Fondation Transplantation, Laboratoire de Chirurgie Expérimentale, 5 Avenue Molière, 67200 Strasbourg, France, (b)Institut Charles Sadron, UPR 22, CNRS, 6 Rue Boussingault, 67083 Strasbourg, France
- H-IV.05** 17:50 THE PATENT PROMOTED BY A UNIVERSITY AT THE CROSSROADS OF THE RESEARCH RESULTS AND THE IMMEDIATE UTILISATION BY THE INDUSTRY
R. Doddoli, BIOFUTURE Research Consortium in Regenerative Medicine, c/o Department of Chemistry, University of Bari, Italy
- H-IV.06** 18:10 -Invited- THE EUROPEAN FEDERATION FOR REGENERATIVE MEDICINE – THE VISION OF A EUROPEAN MERGER IN THIS FIELD
G. Knedlitschek, H.J. Meisel, Forschungszentrum Karlsruhe, Regenerative Medicine Programme, P.O. Box 3640, 76021 Karlsruhe, Germany

Wednesday, June 1, 2005
Mercredi 1er juin 2005

Afternoon
Après-midi

Session V

Session chair : Dieter Falkenhagen

- H-V.01** 14:30 HAEMOCOMPATIBILITY OF AMORPHOUS CARBON THIN FILMS, OPTICAL PROPERTIES AND ADSORPTION MECHANISMS OF BLOOD PLASMA PROTEINS
S. Lousinian, S. Logothetidis, A. Laskarakis, M. Gioti, Aristotle University of Thessaloniki, Department of Physics, 54124 Thessaloniki, Greece
- H-V.02** 14:50 SELF-SUPPORTED MULTILAYER FILMS OBTAINED BY DISINTEGRATION OF pH-RESPONSIVE LAYERS UNDER PHYSIOLOGICAL CONDITIONS
Shoko S. Ono(a,b), Gero Decher(a,c), (a)Institut Charles Sadron, 6 rue Boussingault, 67083 Strasbourg, France, (b)R&D Center, Mitsui Chemicals, Inc, 580-32, Nagaura, Sodegaura, Chiba 299-0265, Japan, (c)Université Louis Pasteur, Faculté de Chemie, 4 rue Blaise Pascal, 67000 Strasbourg, France
- H-V.03** 15:10 -Invited- DISC REPAIR WITH AUTOLOGOUS CHONDROCYTES: A PILOT CLINICAL STUDY
Hans-Joerg Meisel(a), Olivera Alasevic(b), William Hutton(c), Timothy Ganey(d), (a)Bergmannstrost, Halle, Germany; (b)co.don AG, Berlin, Germany; (c)Emory Spine Center, Decatur, GA; (d)Tampa, Florida, USA
- H-V.04** 15:40 -Invited- SHAPE-MEMORY POLYMERS
Andreas Lendlein, GKSS Research Centre Geesthacht, Kantstr. 55, 14513 Teltow, Germany
- H-V.05** 16:00 AN AFM INVESTIGATION OF OLIGONUCLEOTIDES ANCHORED ON AN UNOXIDIZED CRYSTALLINE SILICON SURFACE
G. Longo, A. Cricenti, M. Girasole, P. Perfetti, Istituto di Struttura della Materia, C.N.R. Sezione di Tor Vergata Rome, Italy, F. Cattaruzza, A. Flamini, T. Prosperi, Istituto di Struttura della Materia, C.N.R. Sezione di Montelibretti Rome, Italy
- 16:20 **BREAK**

Session VI

Session chair : Gudrun Knedlitschek

- H-VI.01** 16:40 METAL-POLYMER SMART BIO-ACTIVE NANOCOMPOSITES
Nicola Cioffi, Nicoletta Ditaranto, Luisa Torsi, Luigia Sabbatini, P. Giorgio Zambonin, Dipartimento di Chimica, Università degli Studi di Bari, 4 via Orabona, 70126 Bari, Italy, Lucia Novello, Giuseppina Tantillo, Dipartimento di Sanità e Benessere degli Animali, Università degli Studi di Bari, Strada Provinciale per Casamassima Km 3, 70010 Valenzano, Bari, Italy, Lina Ghibelli, Maria D'Alessio, Dipartimento di Biologia, Università di Roma Tor Vergata, 1, Via della Ricerca Scientifica, 00133 Roma, Italy, Teresa Blevè-Zacheo, Istituto per la Protezione delle Piante, Sezione di Bari, C.N.R., 165/A via Amendola, 70126 Bari, Italy, Enrico Traversa, Dipartimento di Scienze e Tecnologie Chimiche, Università di Roma Tor Vergata 1, Via della Ricerca Scientifica, 00133 Roma, Italy
- H-VI.02** 17:00 2004 BIOACTIVE COATINGS BASED ON POLYELECTROLYTE MULTILAYER ARCHITECTURES FUNCTIONALIZED BY EMBEDDED PROTEINS, PEPTIDES OR DRUGS
Nadia Jessel(a), Joelle Ogier(a), Gero Decher(b), Pierre Schaaf(b), Jean-Claude Voegel(a), (a)INSERM Unité 595, Université Louis Pasteur, 11 rue Humann, 67085 Strasbourg Cedex, France, (b)Institut Charles Sadron (CNRS/ULP), 6 rue Boussingault, 67083 Strasbourg Cedex, France
- H-VI.03** 17:20 INTELLIGENT MULTILAYERS IN BIOMEDICAL APPLICATIONS
B. Saulnier(a), O. Félix(a) and G. Decher(a,b), (a)Institut Charles Sadron (CNRS, UPR 22), 6 rue Boussingault, 67083 Strasbourg Cedex, France, (b)Université Louis Pasteur, 4 rue Blaise Pascal, 67000 Strasbourg, France
- H-VI.04** 17:40 PHOTOCHEMICAL CONTROL OF CdS NANOPARTICLES SIZE
M. Marandi, N. Taghavinia, A. Irajizad and S.M. Mahdavi, Physics Department, Sharif University of Technology, Tehran 14588, Iran
- 19:00 **AWARD CEREMONY**
The symposium organizers and the candidates to the graduate student award are requested to attend.

CONFERENCE RECEPTION

9:00 – 13:00 **POSTER SESSION**

11:00 – 11:20 **BREAK**

12:30 **LUNCH**

POSTER SESSION

Session chair : **Roberto Doddoli**

- H/P01** HYDROGEN PLASMA SURFACE ACTIVATION OF SILICON FOR BIMEDICAL APPLICATIONS
Ricky K.Y. Fu, Xuanyong Liu, Paul K. Chu, Department of Physics & Materials Science, City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong, Chuanxian Ding, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai 200050, China
- H/P02** CARBON NANOMATERIALS PRODUCTION IN THE ELECTRIC DISCHARGE AND THEIR UTILIZATION IN THE POLYMER COMPOSITES
A.E. Shashkov, S.A. Zhdanok, A.P. Solntsev, I.F. Buyakov, A.V. Krauklis, I.A. Zhukova, Heat- and Mass Transfer Institute, Brovki st. 15, Minsk, Belarus
- H/P03** TRANSLOCATION OF BIOMOLECULES ACROSS CELL MEMBRANES BY SINGLE-WALL CARBON NANOTUBES
F. Torrens, Institut Universitari de Ciència Molecular, Universitat de València, Dr. Moliner 50, 46100 Burjassot (València), Spain
- H/P04** SYNTHESIS AND CHARACTERIZATION OF AMPHIPHILIC POLY(LACTIC ACID)-GRAFTED CHONDROITIN SULFATE COPOLYMER FOR BIOMEDICAL APPLICATIONS
Chih-Ta Lee, Ching-Ping Huang, Yu-Der Lee, Taiwan
- H/P05** STUDY OF LASER CREATED ZRO₂ AND HYDROXYAPATITE/ ZRO₂ FILMS FOR IMPLANTOLOGY
M. Jelínek(a,b), T. Dostálová(c), Z. Teuberová(a), M. Seydlova T.(a), P. Mašínová(a), T. Kocourek(a), W. Mróz (d), K. Smetana(e), (a)Institute of Physics AS CR, 182 21 Prague 8, Na Slovance 2, Czech Republic, (b)Institute of Biomedical Research of CTU, nám. Sítná 3105, 27201 Kladno, Czech Republic, (c)1st Medical Faculty, Charles University, Department of Stomatology, Katerinská 32, Prague 2, Czech Republic, (d)Institute of Optoelectronics, MIT, 01-489 Warsaw 49, 2 Kaliski Str. Poland, (e)Institute of Anatomy, 1st Medical Faculty, Charles University, U nemocnice 3, 128 00 Prague 2, Czech Republic
- H/P06** NANOSTRUCTURED LAYERS FROM DNA, DNA:AU, DNA:C₆₀ CLUSTERS
O. Ivanyuta, D. Kolomiyets, O. Prokopenko, O. Schaternik, Radiophysical Faculty and the Scientific and Training Center "Physical and Chemical Material Science", of Kiev National Taras Shevchenko University, 64 Vladimirska str., Kiev 01033, Ukraine
- H/P07** SAR IS THE ESTIMATION CRITERIA OF THE INFLUENCE OF AN ELECTROMAGNETIC FIELD ON BIOLOGICAL OBJECTS
O. Ivanyuta, O. Prokopenko, Radiophysical Faculty and the Scientific and Training Center "Physical and Chemical Material Science", of Kiev National Taras Shevchenko University, 64 Vladimirska str., Kiev 01033, Ukraine
- H/P08** MICRO-PLASMA TEXTURED TI-IMPLANT SURFACES
U. Beck, R. Lange, Univ. Rostock, 18051 Rostock, Germany, H.-G. Neumann, DOT, Charles-Darwin-Ring 1a, 18059 Rostock, Germany
- H/P09** THE APPLICATION OF NUCLEATION EXPLOSION MODEL FOR CALCIUM-PHOSPHATE COATING FORMATION IN BIOMIMETIC PROCESS
Andriy Doroshenko, Oleksandra Kryzhanovska, Yuri Savin, Oleksandr Tolmachov, Scientific and Technological Corporation "Institute for Single Crystals", National Academy of Sciences of Ukraine
- H/P10** MICROWAVE-HYDROTHERMAL SYNTHESIS OF HYDRANGEA-LIKE CALCIUM PHOSPHATE
C.C. Chang, S.J. Wu, H.C. Lin and S.K. Yen, Department of Materials Engineering, National Chung Hsing University, Taichung 40254, Taiwan
- H/P11** STUDY OF MICRO AND NANO SURFACE STRUCTURES FROM UV IRRADIATED URETHANE/UREA ELASTOMERS
M.H. Godinho(a), A.C. Trindade(a), J.L. Figueirinhas(b,c), L.V. Melo(b,d) and P. Brogueira(b,d), (a)Dept. de Ciência dos Materiais and CENIMAT, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, 2829-516 Caparica, Portugal, (b)Physics Dept., Instituto Superior Técnico, Av. Rovisco Pais, 1049-001 Lisboa, Portugal, (c)Centro de Física da Matéria Condensada, Universidade de Lisboa, Av. Prof. Gama Pinto 2, 1649-003 Lisboa, Portugal, (d)ICEMS, Instituto Superior Técnico, Av. Rovisco Pais, 1049-001 Lisboa, Portugal
- H/P12** USE OF SILVER CONTAINING HYDROXYAPATITE GRANULES IN THE RECOVERY OF INFLAMED BONE DEFECTS
J.W. Choi, H.M. Cho, E.K. Kwak, T.G. Kwon, H.M. Ryoo, H.I. Shin, School of Dentistry, Kyungpook National University, Daegu, Korea and Y.K. Jeong, K-S Oh, Nanomaterials application division, KICET, Seoul, Korea

- H/P13** SOME ASPECTS RELATED TO HYDROXYAPATITE FORMATION FROM NATURAL RESOURCES
Csaba Balázs(a), Ferenc Wéber(a), Zsuzsanna Kövér(a), Eniko Horváth(b), Csaba Németh(c), (a)Ceramics and Composites Laboratory, Research Institute for Technical Physics and Materials Science, P.O. Box 49, 1525 Budapest, Hungary, (b)Laboratory for Nanostructures Research, Research Institute for Technical Physics and Materials Science, Budapest, Hungary, (c)Institute of Isotope and Surface Chemistry, Chemical Research Center, P.O. Box 77, 1525 Budapest, Hungary
- H/P14** OPTICAL PROPERTIES OF PORPHYRINE MOLECULES IMMOBILIZED IN NANO-POROUS SILICON MATRIX
V. Chirvony, Institute of Molecular and Atomic Physics, Belarus and V. Parkhutik, R&D Centre MTM, Technical University of Valencia, Spain
- H/P15** KINETIC MEASUREMENTS OF ACETYLSALICYLIC ACID RELEASE FROM MG-AL LAYERED DOUBLE HYDROXIDES
N.A. Sapoletova, I.V. Kolesnik, A.A. Eliseev, E.V. Lukashina, Moscow State University, Leninskie Gory, Moscow, Russia and M.P. Nikiforov, University of Pennsylvania, Philadelphia PA, USA
- H/P16** POLYURETHANE CATHETER WITH SUSTAINED ANTIMICROBIAL EFFECT
Young-Keun Jeong, Dae-Gyu Shin, Kyung-Ja Kim, and Kyung-Sik Oh KICET 233-5 Gasan, Gumchon, Seoul 153-801, Korea
- H/P17** HEXAKIS-[b-(5-METHOXY-3-INDOLYL)-ETHYLAMINO] CYCLOTRIPHOSPHAZENE: SYNTHESIS AND QUANTUM-CHEMICAL CALCULATION
M.F. Bobrov, V.G. Tsirelson, G.V. Popova, M.V. Kadilnikova, D.I. Mendeleyev University of Chemical Technology, Miusskaya sq. 9, Moscow 125047, Russia

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