Phone.: (012) 2952860, room 110, Fax: (012) 2952804

e-mail: nmrmajor@imim-pan.krakow.pl

Employment and positions

Institute of Metallurgy and Materials Science, Polish Academy of Sciences: Ph.D. studies (2002-2007), assistant professor (since 2007)

Scientific Career

M.Sc.: AGH- University of Science and Technology, 2002

Ph.D.: Institute of Metallurgy and Materials Science, Polish Academy of Sciences, 2007

Post grad. studies: Jagiellonian University 2008/2009 in Molecular Biology

Scientific achievements

The most relevant publications during last 5 years:

1.

Sarna J., Kustosz R., **Major R**., Lackner J.M. and Major B.; Polish Artificial Heart- new coatings, technology, diagnostics, Bulletin of the Polish Academy of Sciences;, vol. 58, No 2 (2010) 329-335 (JCR; Impact Factor 0.945)

2.

Lackner JM., Waldhauser W., **Major R**., Major B., Bruckert F.; Hemocompatible, pulsed laser deposited coatings on polymers; Biomedizinische Technik Vol.: 55 (2010) 57-64 DOI: 10.1515/BMT.2010.001 (JCR; Impact Factor: 0.670)

3.

Major R., Sanak M., Wilczek P., Lackner J.M., Kot M., Major B.; Nanostructural materials for implants and cardiovascular biomedical devices; chapter in book ImplantExpert; (2011) 67-90

4.

Major R.; Material science in the heart disease treatment; w Nanostructural materials for implants and cardiovascular biomedical devices A review M Studio Zabrze, (2011), ISBN 978-83-63310-00-4; 67-97 (rozdział monografii)

5.

Lackner J.M., Waldhauser W., **Major R**., Hartmann P.; Biomimetic approaches for designing blood-contacting surfaces for artificial vessels - w Nanostructural materials for implants and cardiovascular biomedical devices A review M Studio Zabrze, (2011), ISBN 978-83-63310-00-4; 99-116 rozdział monografii)

6.

Major R., Maksymow K., Marczak J., Lackner J.M., Kot M., and Major B.; Migration channels produced by laser ablation for substrate endothelialization; Bulletin of the Polish Academy of Sciences Technical Sciences, Vol. 60, No. 2, (2012) 337-342 (Impact Factor 0.945)

7.

Major R, Major B, Tailoring of Tissue-Surface Interaction in Blood Contacting Materials, "Surface Tailoring of Inorganic Materials for Biomedical Applications" ed. Lia Rimondini, Bentham Science Publisher, e-Book (2012) 297-327 (rozdział monografii)

8.

Lackner JM., Waldhauser W., **Major R**., Major L., Hartmann P.; Biomimetics in thin film design - Wrinkling and fracture of pulsed laser deposited films in comparison to human skin; Surface & Coatings Technology Vol.: 215, (2013)192-198 (Impact Factor: 2.193)

9.

Major R.; Self-assembling surfaces of blood-contacting materials; Journal of Material Science Materials in Medicine; Springer 24 (2013) 725-733 (Impact Factor: 2.325)

10.

Major R., Lackner JM., Gorka K., Wilczek P. and Major B.; Inner surface modification of the tube-like elements for medical applications; The Royal Society of Chemistry: Advances 3 (2013) 11283-11291 (Impact Factor: 2.7)

11.

Major R., Bruckert F., Lackner JM., Marczak J. and Major B., Surface treatment of thin-film materials to allow dialogue between endothelial and smooth muscle cells and the effective inhibition of platelet activation; The Royal Society of Chemistry: Advances, 4 (2014) 9491-9502 (Impact Factor 2.562)

12.

Mzyk A., **Major R**., Kot M., Gostek J., Wilczek P., Major B., Chemical control of polyelectrolyte film properties for an effective cardiovascular implants endothelialization, Archives of civil and mechanical engineering 14(2014)262-268 (Impact Factor 0.963)

13.

Major R., Sanak M., Lipinska L., Kot M., Lacki P., Bruckert F., Major B., Graphene based porous coatings with antibacterial and questionable antithrobogenous function- materials and design, Archives of civil and mechanical engineering (praca zaakceptowana) (Impact Factor 0.963)

14.

Mzyk A., **Major R**., Lackner J.M., Bruckert F., Major B., Cytotoxicity control of SiC nanoparticles introduced into polyelectrolyte multilayer films, RSC Advances, 4(2014)31948-31954 (Impact Factor: 3.7)

15.

Trembecka-Wójciga K.,.**Major R**, Lackner J.M., Major B., Biomedical inspired surface modification. Inż.Mater. 6(2014)560-563

16.

Marczak J., Kusinski J., **Major R**., Rycyk A., Sarzyński A., Strzelec M., Czyz K., Laser interference patterning of diamond-like carbon layers for directed migration and growth of smooth muscle cell depositions, Optica Applicata, Vol. XLIV, No. 4, (2014) DOI: 10.5277/oa140408 (0.643)

17.

Trembecka-Wójciga K., **Major R**. Bruckert F., Lackner J.M., Lacki P., Sanak M., Major B., Computer engineering in designing and fabrication of tissue analogue-type coating dedicated for the cardiovascular regeneration Archives of Civil and Mechanical Engineering (2015) doi:10.1016/j.acme.2014.12.005 (Impact Factor 0.963)

18.

Mzyk A., **Major R**., Lackner J.M., Bruckert F., Wilczek P., Major B.Effect of the silicon carbide nanoparticles introduction on biological properties of porous polymer coating, The Royal Society of Chemistry; Advances 5(2015)13906-13916 (Impact Factor: 3.7)

19.

R. Major; Bio-inspired blood-contacting materials elaborated for the heart assist system; Archives of Metallurgy and Materials; 60 (2015) 173-181

20.

Roman Major, Klaudia Trembecka-Wójciga, Marcin Kot, Juergen M. Lackner, PiotrWilczek, Boguslaw Major; In vitro hemocompatibility on thin ceramic and hydrogel films deposited on

polymer substrate performed in arterial flow conditions; Materials Science and Engineering C; 61 (2016) 15-22

21.

K. Trembecka-Wójciga, **R. Major**, J. M. Lackner, B. Butruk-Raszeja, M. Sanak, and B. Major; Nanostructural haemocompatible coatings for the internal side of artificial blood vessels; Materials Science and Engineering C; accepted

22.

R Major, J M Lackner, M Sanak, B Major; Silver nanoparticles influence on the blood activation process and their release to blood plasma from synthetic polymer scaffold; Materials Science and Engineering C; accepted

Books, scripts, monographs:

Monograph: "*Nanostructural materials for implants and cardiovascular biomedical devices*" A review M Studio Zabrze, Editors: P.Wilczek,
R.Major
, 2011, ISBN 978-83-63310-00-4

Total number of citation: **169**
Impact factor: **46.6**
h-index: **8**

Research Projects

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No:2/0-PW/PO1-PBZ-MNiSW/2007- Polskie Sztuczne Serce (2008-2011); co-ordynator: Foundation for Cardiac Surgery Development; (executor)

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CardioBioMat MNT Era-Net-MNT/15/2009 "Nanostructural materials for implants and cardiovascular biomedical devices".

-

Zamat POIG 01.01.02.-00-015/09- „Zaawansowane materiały i technologie ich wytwarzania" (executor)

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Exchange project Poland- Austria (Joanneum Research- dr habit. Jurgen M. Lackner) 2010-2011: Development strategies and applications of the multifunctional nanocomposite tribological ceramic/carbon coatings (coordinator)

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Exchange project Poland- France 2010-2011 (National Polytechnique de Grenoble MINATEC prof Franz Bruckert): Polonium "New gradient materials fabricated by laser method for blood contact application" (coordinator)

-

Research project funded by the National Science Centre: Number: N N507 306640; Opracowanie i diagnostyka wielofunkcyjnych powłok typu ceramika/ uwodorniony amorficzny węgiel na elementy pomp wspomagania sztucznych komór serca (executor)

-

Exchange project Poland- Austria 2012-2014- (Joanneum Research- dr habit. Jurgen M. Lackner) 023/2012/2013/2014 8548/R 12/R 14; The development of thin films for biomedical

devices support the heart: a new strategy based on a vacuum depositing self-assembled biomaterials (coordinator)

-

Project of National Center of Science: Numer wniosku: 2011/03/D/ST8/04103 "Self-assembling, biomimetic porous scaffolds in terms of inhibiting the activation of the coagulation system" (Principal investigator)

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Project of National Center of Science; 2014/13/B/ST8/04287; Bio-inspired thin film materials with the controlled contribution of the residual stress in terms of the restoration of stem cells microenvironment (Principal investigator)

-

Applied Research Program, 3, Medical and Pharmaceutical Science; Developing of the innovative bioactive prosthetic heart valves (Main executor)

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Project of National Center of Science; Bio-mechanical and microstructure analysis of multilayer nano- composite, protective coatings for metallic substrates for tissue interaction ID: 2012/07/B/ST8/03396 (Executor)

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Project of National Center of Science; Multilayered, wear resistant, self- sealing, protective coatings elaboration for carbon- fiber- composite materials ID: 2012/06/M/ST8/00408 (Executor)

-

M-ERA.NET Decyzja nr DZP/M_ERA.NET- 2014/291/2015 z dnia 18.11.2015; Nonthrombogenic metal-polymer composites with adaptable micro and macro flexibility for next generation heart valves in artificial heart devices

Experience gained abroad

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8.11.2003 - 7.12.2003: Joanneum Research Forschungsgesellschaft mbH, Leoben, Laser Center, Austria

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2.08.2004- 28.08.2004: Joanneum Research Forschungsgesellschaft mbH, Leoben, Laser Center, Austria

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4.07.2005- 27.07.2005 Joanneum Research Forschungsgesellschaft mbH, Leoben, Laser Center, Austria

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3.07.2006-28.07.2006 Joanneum Research Forschungsgesellschaft mbH, Leoben, Laser Center, Austria

-

15.09.2006-15.10.2006 Institut National Polytechnique de Grenoble (INPG) UMR 5628 CNRS-INPG, Minatec-INPG LABORATOIRE DES MATERIAUX ET DU GENIE PHYSIQUE INPG GRENOBLE - MINATEC 3, PARVIS LOUIS NEEL-BP 257 38016 GRENOBLE CEDEX 1, Francja-prof F. Bruckert

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26.08.2007-14.09.2007 European School on Nanosciences and Nanotechnologies ESONN 2007 Grenoble

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14.09.2007-14.10.2007 Institut National Polytechnique de Grenoble (INPG) UMR 5628 CNRS-INPG, Minatec-INPG LABORATOIRE DES MATERIAUX ET DU GENIE PHYSIQUE INPG GRENOBLE - MINATEC 3, PARVIS LOUIS NEEL- BP 257 38016 GRENOBLE CEDEX

1, Francja-prof F. Bruckert

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1.06.2008-30.08.2008 Joanneum Research Forschungsgesellschaft mbH, Leoben, Laser Center, Austria- stypendium

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13.09.2008-27.09.2008 Institut National Polytechnique de Grenoble (INPG) UMR 5628 CNRS-INPG, Minatec-INPG LABORATOIRE DES MATERIAUX ET DU GENIE PHYSIQUE INPG

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1.02.2010-31.07.2010 Institut National Polytechnique de Grenoble (INPG) UMR 5628 CNRS-INPG, Minatec-INPG LABORATOIRE DES MATERIAUX ET DU GENIE PHYSIQUE INPG- stypendium CNRS (realizowane w okresach : 1.02.2010-1.03.2010 ; 26.06.2010-26.07.2010 ; 19.09.2010-30.10.2010 ; 25.01.2011-2.03.2011

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Stypendium Instytutu Goethego: 2011 (dwu tygodniowy intensywny kurs języka niemieckiego na poziomie B.2.2)

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5.09.2011- 1.09.2011 Institut National Polytechnique de Grenoble (INPG) UMR 5628 CNRS-INPG, Minatec-INPG LABORATOIRE DES MATERIAUX ET DU GENIE PHYSIQUE INP

Prizes and awards

2002- M.Sc. with honour

2004- Scientific award for the year 2004 given by the head of PAS for the collective elaboration of the project ”Implantable pneumatic assist device for the heart support with the modified biocompatibile surface layer”.

2004- The first prize in forth International Ph. D student session “Materials and Technology in XXI century”- presentation. Silesian University of technology, Katowice Poland

2005- Student Award for the best presentation the E-MRS Symposium K on "Protective Coatings and Thin Films"- France

2005- Fellowship Awardees at the Massachusetts Institute of Technology Conference on Computational Fluid and Solid Mechanics- presentation. Cambridge, U.S.A.

2008- Grant „brainpower Austria“career perspectives in the field of research & development in Austria, at establishing ties between researchers abroad and the Austrian scientific community, and at giving information about innovation in Austria

2008- Invited speaker during the conference: Cooperation- Nano 0825-26, 2008, Austria

2010- CNRS 6 month Scholarship

2011- Invited speaker during VI Meeting of Members confocal microscopes

2012- International Project Management Association Certificate level D

2012- Team award the name of Professor Zbigniew Religa for monographs "Nanostructural materials for implants and cardiovascular biomedical devices" proving and promoting the

achievements of Polish scientists in research on artificial organs

Invited Speaker 16.01.2013 "Technologies of the surface layer modification of the materials", Warsaw

Fellowships abroad from the last 5 years

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1.02.2010-31.07.2010 Institut National Polytechnique de Grenoble (INPG) UMR 5628 CNRS-INPG, Minatec-INPG LABORATOIRE DES MATERIAUX ET DU GENIE PHYSIQUE INPG- stypendium CNRS (executed in: 1.02.2010-1.03.2010 ; 26.06.2010-26.07.2010; 19.09.2010-30.10.2010 ; 25.01.2011-2.03.2011

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Schollarschip of Goethe Institute: 2011 (two-weeks intensive German language course on the level of B.2.2)

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5.09.2011- 1.09.2011 Institut National Polytechnique de Grenoble (INPG) UMR 5628 CNRS-INPG, Minatec-INPG LABORATOIRE DES MATERIAUX ET DU GENIE PHYSIQUE INP

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02.09-4.10.2012 Institut National Polytechnique de Grenoble (INPG) UMR 5628 CNRS-INPG, Minatec-INPG LABORATOIRE DES MATERIAUX ET DU GENIE PHYSIQUE INP

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1 - 25.09.2013 Institut National Polytechnique de Grenoble (INPG) UMR 5628 CNRS-INPG, Minatec-INPG LABORATOIRE DES MATERIAUX ET DU GENIE PHYSIQUE INP

Didactic activity

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Auxiliary supervisor of doctor theses of: M.Sc Katarzyna Maksymow (completed in 2013, M.Sc.Klaudia Trembecka (in progress)

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Support on the part of the thesis of Dipl.Eng. Klaudia Trembecka and Dipl.Eng. Maciej Wójciga (Faculty of Electrical Engineering, Automatics, Computer Science and Biomedical Engineering, AGH University of Science and Technology

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Lectures at the Mechanical Faculty of Cracow University of Technology, specialization: Biomedical Engineering entitled: "Tissue engineering and genetics" in 2011-2-14, 15 hrs in semester

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Visits to laboratory for students of: University of Science and Technology AGH, University of Technology in Cracow, Jagiellonian University.

Organizational activity

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Cyclic meeting of the Polish-Austrian and Polish-France exchange projects

- organization of the Polish-Austrian and Polish-France exchange project meetings
- member of organizing committee of the international conference: Advances Materiałs and Technologies AMT 2010, Zakopane 2010;
- member of organizing committee of 60-years jubilee of IMIM PAS, Cracow, 2013

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Member of the Polish Biomaterials Society

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Member of Biomaterial Section of the Committee for Materials Science Polish Academy of Sciences.

Main scientific interest

Non-thrombogenic self-assembling nanoscale thin film biomaterials. Cell detachment assays, X-ray diffraction techniques. Confocal microscopy