

Curriculum Vitae

Personal Details

Name and Surname: Justyna Krzak

Work Address: ul. Mariana Smoluchowskiego 25
50-370 Wrocław

Work Phone: +48 71 320 3075

Work e-mail: justyna.krzak@pwr.edu.pl

URL for web site:

- scholar.google.pl/citations?user=MDWTsWwAAAAJ
- kmim.wm.pwr.edu.pl/en/author/justyna-krzak

I am a researcher in Department of Mechanics, Materials Science and Engineering at Wrocław University of Science and Technology, Wrocław, Poland. I also give lectures and exercises for students. Till 2018 I am a co-author of more than 70 scientific papers in recognized journals and reports for industrial partners. I have participated in more than 14 national and international projects. I am a member of Polish and International Societies (PSTAM, ISGS, IAAM, SIMS).

I completed Ph.D. in Materials Engineering at AGH University of Science and Technology in Krakow and master studies at Wrocław University of Science and Technology on two faculties: Chemistry and Mechanical Engineering. My research interests lie in area of modification of surface properties by applying a sol-gel coatings, with a focus on methodology of synthesis and thin film metrology. In recent years, I have focused on adjusting the properties of the coating to the working environment according to industries demand. I have active collaboration with biologist, mechanics and chemists on solving interdisciplinary problems as influence of coating's chemical composition on mechanical properties or effect of sol-gel biocoatings on stem cell response, and also wettability parameters.

From 2014 I am a Vice Head of the Department of Mechanics, Materials Science and Engineering. I build the strategy based on interdisciplinary development driven by collaboration with industry and implement organizational structure of the Department. The Department's motto is Culture of the experiment.

Higher Education

01.10.2005–01.07.2010 PhD in Engineering, in the field of Materials Science at Faculty of Materials Science and Ceramics, AGH University of Science and Technology, Kraków, Poland PhD Thesis: *'Bioactive coating on metallic substrates, obtained by sol-gel method'*

01.10.2002–13.10.2005 Faculty of Mechanical Engineering, Wrocław University of Technology Master thesis: *'Anti-corrosion coating of medical implants obtained by sol-gel method'*

01.10.1998–02.07.2004 Faculty of Chemistry, Wrocław University of Technology Master thesis: *'Synthesis and physicochemical research of calcium compounds with natural origin ligands'*

Professional Training & Experience

from 01.01.2020 Vice Head of Department of Mechanics, Materials and Biomedical Engineering, Faculty of Mechanical Engineering, Wrocław University of Science and Technology, Wrocław, Poland

01.04.2014–31.12.2019 Vice Head of Department of Mechanics, Materials Engineering and Science, Faculty of Mechanical Engineering, Wrocław University of Science and Technology, Wrocław, Poland

from 01.10.2011 Adjunct at the Institute of Materials Science and Applied Mechanics, Wrocław University of Technology, Wrocław, Poland

01.10.2010–31.09.2011 Assistant Professor at the Institute of Materials Science and Applied Mechanics, Wrocław University of Technology, Wrocław, Poland

10.2014–06.2015 Participant of SKILLS program of Foundation for Polish Science. Program SKILLS Mentoring — qualification in the competition

05.2014–06.2014 Participant of internship-training program within the project 'Support for research infrastructure management beneficiaries of 2.1 and 2.2 POIG', also called 'SIMS — Science Infrastructure Management Support' — qualification in the competition

01.07.2012–31.07.2012 Training at WHIRLPOOL EUROPE srl, Comerio, Italy

01.10.2010–30.09.2011 Assistant at the Institute of Materials Science and Applied Mechanics Wrocław University of Technology

08.11.2010–07.01.2011 Training at WHIRLPOOL EUROPE srl, Comerio, Italy

01.10.2007–30.06.2008 Coordinator of creation of Sol-Gel Materials and Nanotechnology Laboratory at Wrocław University of Technology, the preparation of equipment specifications and a member of the commission tender

02.07.2007–31.12.2007 Self-referent in the project RegStrat with 6.PR, "Strategic Policy Intelligence Tools for Belter and Technology Investment Strategies in Europe's Regions" Wrocław University of Technology

14.09.2006–24.09.2006 Head of event Reliable Technology, organized during the Lower Silesian Science Festival

10.01.2005–30.09.2005 Coordinator for the European Union in the Sol-Gel Materials & Nanotechnology Center of Excellence, Wrocław University of Technology

Functions and Positions

from 27.10.2016 Member of the University Disciplinary Commission for Academic Teachers

from 01.10.2016 Member of the Council of the Faculty of Mechanical Engineering of the Wrocław University of Science and Technology

from 01.10.2015 Member of the hospitality committee for doctoral and postgraduate studies at the Faculty of Mechanical Engineering of the Wrocław University of Science and Technology

National & International Associations

1. [Polish Society of Theoretical and Applied Mechanics](#) (PSTAM) – member, treasurer of the Wrocław branch of Society in 2016–2018
2. [International Sol-Gel Society](#) (ISGS) — member
3. Science Infrastructure Management Society (SIMS) — founder member
4. [International Association of Advanced Materials](#) (IAAM) — member

Completed & Implemented Research Projects

1. Project UMO-2020/39/I/ST5/03493 *'Research on the influence of self-healing, organic-inorganic sol-gel layers on the corrosion resistance and fatigue of steel in the VHCF range'* founded by the National Science Centre, Poland under the cooperation with Lead Agency Procedure (LAP) in the Weave program, principal investigator, 12.2021 – ongoing
2. Project NOR/SGS/HyStor/0306/2020-00 *Improving the Efficiency of Hydrogen Storage Vessels through Novel Oxide Coatings – HyStor* Founded by the National Center for Research and Development in Poland under the Small Grant Scheme (SGS) Project Programme, 10.2021–ongoing
3. Project no. U/0180/159/2021 *'Reduction of hydrogen permeability through MDPE liner by applying doped sol-gel coatings'* contracted by RAIGI , France, principal investigator, 05.2021–ongoing
4. Project Sonata Bis no.UMO/2016/22/5/E/ST5/00530 *'Glasses and glass composites in nano-scale with enhanced bioactivity and functionality'*, founded by National Science Centre Poland, investigator, 05.2017–ongoing
5. Research task: *'Conducting research in the selection of materials for the construction of the crystallizer'* under the Project *'Develo*Founded by the National Center for Research and Development in Poland under the Small Grant Scheme (SGS) project, Programmement of

- crystallization technology based on a new type of crystallizer for organic compounds from alloys in suspension*' POIR.01.01.01.-000198/15-00, principal investigator, 05.2017–07.2019
6. Project of own research: *'Oxide coatings activated depending on the application - sol-gel synthesis, research of composition and properties - Part 1'*, Wrocław University of Science and Technology, principal investigator, 09.2014–06.2015
 7. Research task: *'Materials and technologies for advanced storage systems and energy conversion'* implemented by the WUT Wrocław Research Centre EIT+ in the framework of POIG.01.01.02-02-002 / 08-00, investigator, 05.2010–08.2014
 8. Research task: *'Nanocomposites and SMART materials'* implemented by WUT for Wrocław Research Centre EIT+ in the framework of POIG.01.01.02-02-002 / 08-00, investigator, 06.2010–06.2014
 9. Project no. 621137/W10/K10 *'Research services to commercial entities in the field of physico-chemical and mechanical investigations'*, principal investigator, 01.2014–12.2014
 10. Project no. B20103/I19, project of own research entitled *'Preparation, research and applications of selected amorphous and nanocrystalline materials'*, principal investigator, 2013–2014
 11. Research task Under the Project *'Biotechnologies and Advanced Medical Technologies'* nr POIG.01.01.02-02-003/08 funded under the Innovative Economy Programme by European Union: *'Evaluation of the regenerative potential of damaged bone and nervous tissue through the isolation of autologous stem cells from adipose tissue and bone marrow with the aid of bionanomaterials'* principal investigator of the design of coating materials and supervision of materials synthesis, 2012–2013
 12. Project no. 630777/I19 *'Application of SiO₂ coatings produced by sol-gel method as a protective coating according to the Electrolux requirements'*, Contracted by ELECTROLUX Italy S.p.A. principal investigator, 2012–2013.
 13. Research task: *'Application of sol-gel sensors/markers for identification of chemicals and bacteria in grey water'* under the Project *'Energy efficiency, optimized resources use and process innovation of home appliances and their domestic integration (GREEN KITCHEN)'*, Industry-Academia Partnerships and Pathways (IAPP) - Marie Curie Actions, Grant agreement no.: 251600 in cooperation with Whirlpool Europe, principal investigator, 2010–2014
 14. Research project under the GRANT - research supported through fellowships for doctoral students, Human Capital Operational Programme, Priority VIII, Action 8.2, Sub-8.2.2, 04.2009–03.2010; principal investigator, Fifth place in the ranking list
 15. PhD Grant No. N N507 4491 33, *'Bio-active coatings on metallic substrates obtained by the sol-gel method'*, principal investigator, 2007–2009
 16. Research project No. N507 009 31/0275 *'Research on the applicability of the sol-gel structures on the outer layer of implants'* Wrocław University of Technology, Faculty of Mechanical Engineering, Institute of Design and Operation, investigator, 2006–2009
 17. Research project under the First scholarship program ZPORR for the best PhD student of Wrocław University of Technology, ZPORR, Priority II, Action 2.6, principal investigator, 05.2007–10.2007
 18. Project for WZZ Herbapol - *'Synthesis and physicochemical investigation of calcium compounds with naturally occurring ligands'*, investigator, 2001–2004

Awards & Prizes

1. Wrocław University of Science and Technology Rector's Team Award for organizational, didactic and scientific achievements, 2021
2. Wrocław University of Science and Technology Rector's award in recognition of a distinctive contribution to the University's activities, 2017
3. 'IAAM Scientist Medal' of year 2016 of International Association of Advanced Materials for notable and outstanding research in the Advanced Materials Science & Technology
4. Wrocław University of Science and Technology Rector's Scholarship-Award for outstanding achievement in the category of scientific, 2016
5. Wrocław University of Science and Technology Rector's Team Award for organizational, didactic and scientific achievements, 2015
6. Distinction for the MA thesis supervisor, "Functionalization of oxide materials with organic compounds of a pharmacological character", in the Professor Roman Sobolski's Competition of Diploma Theses in the Field of Mechanics and Machine Design, 2014
7. First prize at the IV International Scientific Students Conference of Wrocław University of Technology in the session 'Technical look at the man' 2006
8. Diploma for master thesis: "Anti-corrosion coating of medical implants obtained by the sol-gel method" in the competition for master thesis of discipline Mechanical Engineering and Machine Building named Prof. Romana Sobolskiego, 2005

Achievements of Publishing

1. Publications documented in the library of the Wrocław University of Science and Technology – 108
2. Public available publications — 91, incl
 - publications in international journals – 41
 - patents – 1
 - co-author of chapter: '*Advancement of surface by applying a seemingly simple sol-gel oxide coating*' in Book: *Advanced Surface Engineering Materials (Advanced Materials Book Series)*, Editor: Ashutosh Tiwari, Rui Wang and Bingqing Wei; Managing Editors: Sachin Mishra and Sophie Thompson; WILEY-Scrivener Publishing, USA, Year of Publication: 2016
 - co-author of chapter: '*Sol-gel surface functionalization regardless of form and type of substrate*' in Book: *Handbook of Nanomaterials for Industrial Applications*, Editor: Hussain, Chaudhery Mustansar; Elsevier, 2021
 - co-editor of shorted materials of RegStrat Project – 3 positions

Courses for Students

- Chemistry – lectures and classes
- Tissue and biomaterials testing methods – laboratory

- Mechanics – classes

Languages

- Polish Mother language
- English C
- French A

Other Information

- interest in surface modification, medicine
- favorite music: smooth jazz, classical music
- excellent: work organization, teamwork skills and communication skills