

## Curriculum vitae: Pawel Sikorski

Gender: Male.

Nationality: Polish.

Date of Birth: 24.07.1974

Research ID: [A-2304-2009](#), [Google Scholar Profile](#)

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Research group web page: <http://www.ntnu.edu/physics/bionano>



### HIGHER EDUCATION:

**1998 – 2001** Ph.D. in Polymer Physics, University of Bristol, UK. Ph.D. thesis supervisor: Prof. E.D.T. Atkins

**1993 – 1998** M.Sc. in Material Science, with distinction. Wrocław University of Science and Technology, Poland

### CURRENT AND PREVIOUS POSITIONS:

*NTNU, Norwegian University of Science and Technology:*

**2011–present** Professor, Biophysics and Medical Technology, Department of Physics

**2005–2011** Associate Professor, Biophysics and Medical Technology, Department of Physics

**2004–2005** Post.Doc., Department of Physics/Department of Biotechnology

**2002–2004** Post.Doc., Department of Physics

*University of Bristol, UK:*

**2001–2002** Research Associate, Department of Physics

### MOBILITY:

**2018–2019** Sabbatical at University of California, Davis. Department of Biomedical Engineering. Working in the group of Prof. J. Kent Leach on biomaterial and cellular approaches to tissue engineering and regenerative medicine.

### SUPERVISION OF GRADUATE STUDENTS AND RESEARCH FELLOWS:

*Post.Doctoral researchers*

**2008–2011** Minli Xie. Nanoscale Control of Mineral Deposition within Polysaccharide Gels.

**2013–2017** David Bassett. Mineralized, bioinspired materials for tissue engineering.

**2014–2016** Peter Køllensperger. Marie Curie Intra-European Fellow.

*Doctoral students*

**2006–2010** F. Mumm: Interactions of High Aspect Ratio Nanostructures and Biological Systems.

**2007–2011** M. Ø. Olderøy: New composite biomaterials prepared by mineralization of alginate micro-beads.

**2011–2015** K.S. Beckwith: Nanostructured devices for cell studies.

**2013–2017** S.H. Bjørnøy: Mineralized, bioinspired materials for tissue engineering.

**2016–2020** J. Vinje: Nanostructured surfaces for cell-surface interaction studies, cell manipulation and biotechnical applications.

**2017–2020** J.S. Zehner: Systems analysis and fundamental control of bacterial processes in the production of bio-concrete for construction purposes (BioZement 2.0)

**2017–2021** S. Lehnert: 3D biomaterials.

**2014–2018** M. Schweikle: Characterisation of mineralised synthetic hydrogel scaffolds for bone repair. Co-supervisor.

### **TEACHING ACTIVITIES:**

**2021 – present** TFY4170 - Physics 2: Wave physics and quantum mechanics.

**2019 – present** TFY4350 - Introduction to Nanotechnology. 1st year course for Master in Nanotechnology study program.

**2007 – 2017** TFY4335 - Nano Life Science: Course for Master in Nanotechnology study program at NTNU. The course covers cellular biophysics and many aspects of bionanotechnology, use of micro- and nano-fabrication in cell biology, advanced characterisation methods.

**2011 – 2018** TFY4280 - Signal Processing: 3rd year course for physics and biophysics students.

**2007 – 2015** Several smaller modules, including one on applications of FIB-SEM tomography in cell biology and next-generation DNA sequencing.

**2007 – present** Main supervisor:  $\approx 20$  Master thesis (Master in Nanotechnology, specialisation bionanotechnology)

### **ORGANISATION OF SCIENTIFIC MEETINGS**

**Kongsvold Biophysics Meeting 2012** Main organizer.

**Scandinavian Society for Biomaterials 10th Annual Meeting** Hafjell, Norway. Organizing committee.

**Biophysics and Medical Physics Spring Meeting** Trondheim 12th to 13 May 2022 Main organizer.

**TNNN Conference 2022** The First Norwegian Young Scientist Research Conference in Nanoscience and Nanotechnology, Trondheim, 30 November to 2nd of December. Main organizer.

### **INSTITUTIONAL RESPONSIBILITIES:**

**2005 – 2018** Involved in establishment and running of NTNU nanotechnology laboratory (NTNU NanoLab), where I was involved in planning and coordination of research related to bionanotechnology.

**2012 – 2017** Leader of the study program board for Master in Nanotechnology study program at NTNU. This correspond to a 20% position and involves coordination of all aspect of Master in Nanotechnology education at NTNU.

**2015 – 2018** Member of the leader group of the Strategic Research Areas Health at NTNU, representing the Faculty of Natural Science and Technology.

**2015 – 2018** Head of division. Biophysics and Medical Technology. Member of the Department of Physics Leader Group.

### **PROJECT MANAGEMENT EXPERIENCE:**

**2007-2011** PI of RCN grant (ManoTat prgram): “Nanoscale Control of Mineral Deposition within Polysaccharide Gel Networks”.

**2013-2017** PI of RCN grant (FRINATEK): “Mineralized, hierarchical, bioinspired materials for tissue engineering”.

**2017-2021** co-applicant, NFR grant (BIOTEK2021 Centre for Digital Life Norway): “Systems analysis and fundamental control of bacterial processes in the production of bio-concrete for construction purposes (BioZement 2.0)”.

**2014-2016** Supervisor, FP7-Marie Skłodowska-Curie Individual Fellowships. Peter A. Kohlensperger.

**2022-2030** Main applicant and the Research School Leader: Research School for Training the Next Generation of Micro- and Nanotechnology Researchers in Norway (TNNN). RCN.

**COMMISSIONS OF TRUST:**

**2016 – 2018** The Research Council of Norway. Nanotechnology and Advanced Materials (NANO2021). Programme board member.

Scientific reviewer for journals such as ACS Nano, Acta Biomaterialia, Biomacromolecules, Macromolecules, Small, Nature Materials.

Administrator of 3 PhD thesis defence committees. Member of evaluation committee for 2 PhD thesis, University of Copenhagen, Denmark

**MAJOR COLLABORATIONS:***International:*

1. Prof. L.C. Serpell (Sussex Amyloid Protein Group, University of Sussex, UK) (8 publications).
2. Associate. Prof. K. Martinez. Nano-Science Center. University of Copenhagen, Denmark (1 publication).
3. Prof. J. Kent Leach. University of California, Davis. Department of Biomedical Engineering (2 publications).

*National:*

1. Prof. V. G. H. Eijssink (4 publications).
2. Prof. J.P. Andreassen, Department of Chemical Engineering, NTNU (6 publications).
3. Prof. B.L. Stånd Department of Biotechnology, NTNU (6 publications).
4. Prof. T. Standal, Prof. Astrid Lægreid Department of Cancer Research and Molecular Medicine, Faculty of Medicine, NTNU (1 publication).
5. Prof. Ø. Halaas. Department of Cancer Research and Molecular Medicine, Faculty of Medicine, NTNU. Nanomedicine, application of FIB/SEM tomography in cell biology research (collaboration on 2 Master thesis projects, 1 publication).
6. Prof. J.E. Brinchmann. Norwegian Center for Stem Cell Research. Cell therapy research group at the Institute of Immunology, Rikshospitalet. Oslo. Norway (1 publication).
7. Dr. Anja Røyne. Department of Physics, University of Oslo. (1 publication).
8. Dr. Alexander Wentzel. SINTEF Materials and Chemistry. Trondheim (4 publication).
9. Prof. Cinzia Progida. Department of Biosciences. UiO. (1 publication).

**Track record:** Publications: Total 75 (excluding per-prints). 23 as a senior author, 13 as a first author. H-index: 34, sum of times cited  $\approx$ 5000 (Google Scholar, 2022).

Selected senior author publications in leading international journals:

1. Lehnert, S.; Sikorski, P. Application of Temporary, Cell-Containing Alginate Microcarriers to Facilitate the Fabrication of Spatially Defined Cell Pockets in 3D Collagen Hydrogels. *Macromolecular Bioscience* 2021, 2100319. <https://doi.org/10.1002/mabi.202100319>.
2. Vinje, J. B.; Guadagno, N. A.; Progida, C.; Sikorski, P. Analysis of Actin and Focal Adhesion Organisation in U2OS Cells on Polymer Nanostructures. *Nanoscale Research Letters* 2021, 16 (1), 143. <https://doi.org/10.1186/s11671-021-03598-9>.
3. Zehner, J.; Røyne, A.; Sikorski, P. A Sample Cell for the Study of Enzyme-Induced Carbonate Precipitation at the Grain-Scale and Its Implications for Biocementation. *Scientific Reports* 2021, 11 (1), 13675. <https://doi.org/10.1038/s41598-021-92235-7>.
4. Zehner, J.; Røyne, A.; Sikorski, P. Calcite Seed-Assisted Microbial Induced Carbonate Precipitation (MICP). *PLoS ONE* 2021, 16 (2 February), e0240763. <https://doi.org/10.1371/journal.pone.0240763>.
5. Lehnert, S.; Sikorski, P. Tailoring the Assembly of Collagen Fibers in Alginate Microspheres. *Materials Science and Engineering C* 2021, 121, 2020.09.23.309823. <https://doi.org/10.1016/j.msec.2020.111840>.

6. Sikorski, P. Electroconductive Scaffolds for Tissue Engineering Applications. *Biomaterials Science* 2020, 8 (20), 5583–5588. <https://doi.org/10.1039/d0bm01176b>.
7. Vorwald, C. E.; Gonzalez-Fernandez, T.; Joshee, S.; Sikorski, P.; Leach, J. K. Tunable Fibrin-Alginate Interpenetrating Network Hydrogels to Support Cell Spreading and Network Formation. *Acta Biomaterialia* 2020. <https://doi.org/10.1016/j.actbio.2020.03.014>.
8. Vinje, J.; Beckwith, K. S.; Sikorski, P. Electron Beam Lithography Fabrication of SU-8 Polymer Structures for Cell Studies. *Journal of Microelectromechanical Systems* 2020, 29 (2), 160–169. <https://doi.org/10.1109/JMEMS.2020.2967174>.
9. Schweikle, M.; Bjørnøy, S. H.; van Helvoort, A. T. J.; Haugen, H. J.; Sikorski, P.; Tiainen, H. Stabilisation of Amorphous Calcium Phosphate in Polyethylene Glycol Hydrogels. *Acta Biomaterialia* 2019, 90, 132–145. <https://doi.org/10.1016/j.actbio.2019.03.044>.
10. Røyne, A.; Phua, Y. J.; Le, S. B.; Eikjeland, I. G.; Josefsen, K. D.; Markussen, S.; Myhr, A.; Throne-Holst, H.; Sikorski, P.; Wentzel, A. Towards a Low CO<sub>2</sub> Emission Building Material Employing Bacterial Metabolism in a Two-Step Process of Limestone Dissolution and Recrystallization: The Bacterial System and Prototype Production. *bioRxiv* 2019, 14 (4), 535161. <https://doi.org/10.1101/535161>.
11. Mumm, F.; Beckwith, K. M.; Bonde, S.; Martinez, K. L.; Sikorski, P. A Transparent Nanowire-Based Cell Impalement Device Suitable for Detailed Cell-Nanowire Interaction Studies. *Small* 2013, 9 (2), 263–272. <https://doi.org/10.1002/smll.201201314>.
12. Beckwith, K. S.; Ullmann, S.; Vinje, J.; Sikorski, P. Influence of Nanopillar Arrays on Fibroblast Motility, Adhesion, and Migration Mechanisms. *Small* 2019, 15 (43), 1902514. <https://doi.org/10.1002/smll.201902514>.
13. Gonzalez-Fernandez, T.; Sikorski, P.; Leach, J. K. Bio-Instructive Materials for Musculoskeletal Regeneration. *Acta Biomaterialia* 2019, 96, 20–34. <https://doi.org/10.1016/j.actbio.2019.07.014>.
14. Bassett, D. C.; Håti, A. G.; Melø, T. B.; Stokke, B. T.; Sikorski, P. Competitive Ligand Exchange of Crosslinking Ions for Ionotropic Hydrogel Formation. *Journal of Materials Chemistry B* 2016, 4 (37), 6175–6182. <https://doi.org/10.1039/c6tb01812b>.
15. Håti, A. G.; Bassett, D. C.; Ribe, J. M.; Sikorski, P.; Weitz, D. A.; Stokke, B. T. Versatile, Cell and Chip Friendly Method to Gel Alginate in Microfluidic Devices. *Lab on a Chip* 2016, 16 (19), 3718–3727. <https://doi.org/10.1039/C6LC00769D>.