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Education

Harvard University, Cambridge, MA, USA
Ph.D. Candidate in Biological and Biomedical Sciences, 2013–
Advisor: Prof. Pamela Silver, Ph.D.
Thesis: Spatial Proteomics in Diatoms: Towards a Systems View of Biosilicificaton and Beyond

University of Ljubljana, Ljubljana, Slovenia
Diploma in Biotechnology (Summa Cum Laude), June 2012

Selected Coursework

Harvard University: Molecular Biology (BCMP 200) • Principles of Genetics (GENETICS 201) • Programming and Statistical Modelling in R (BIO 503) • Genomic Data Manipulation (BIOSTAT 297) • Quantitative Methods for Biologists (NEURO 306qc) • Biomaterials (ENG-SCI 228) • Chemistry in Materials Science and Engineering (APPHY 235)

University of Ljubljana: Chemistry • Physical Chemistry • Biochemistry • Selected topics in Physics • Mathematics • Statistical Methods • Bioinformatics • Genomics • Microbial Physiology • Microbial Biotechnology • Plant Physiology • Plant Biotechnology • Metabolic and Protein Engineering • Membrane Biology • Molecular Evolution

Selected Honors

Kavčič Award, Ljubljana, Slovenia (04/11/2013)
Proteus, the oldest popular science magazine in Slovenia (est. 1933), awarded me for an article about bionanotechnology and the BIOMOD competition.

University of Ljubljana **Prešeren Award** for Diploma Thesis, Ljubljana, Slovenia (11/22/2012)
This award represents the highest recognition of undergraduate academic work in Slovenia. I was one among 13 recipients and one among 3 in the Life Sciences.

Krka Prize for Diploma Thesis, Novo mesto, Slovenia (10/19/2012)
Krka is one of the two largest pharmaceutical companies in Slovenia. This prize acknowledges outstanding under- and postgraduate work in pharmacy-related disciplines. I was one among 25 prize winners in a joint category including postgraduate students.

University of Ljubljana Rector's **"Best Innovation Award"**, Ljubljana, Slovenia (12/07/2011)
Our team was a runner-up among 6 finalists and the total of 40 participating teams for presenting a business idea built on the iGEM 2010 project.

Gold Medal, BIOMOD 2011, Boston, MA (11/05/2011)
Our project on zinc finger-mediated DNA origami functionalization placed 2nd at this annual Biomolecular Design Competition.

Grand Prize, iGEM 2010, Cambridge, MA (11/08/2010)
iGEM - international Genetically Engineered Machines competition. I presented our team's winning project on DNA-guided assembly of biosynthetic pathways. We won among ~130 student teams from around the world.

Zois Stipend (2002–2011)
Stipend given by the Slovenian government to the most gifted students and those whose skills are most likely to complement the economic and cultural needs of society.

Work Experience

Organism Engineer, Ginkgo Bioworks, Inc., Boston, MA (Oct 2012–July 2013)
Utilized in-house developed DNA assembly and LC-MS pipelines as well as genome and metabolic engineering tools to build an industrially viable bacterial strain for high-added value fragrance molecule production.

Expert Associate, National Institute of Chemistry, Ljubljana, Slovenia (June 2010–Aug 2012)
Laboratory of Prof. Roman Jerala, Ph.D. Co-developed a DNA-based synthetic biology strategy for optimization of biosynthetic pathways. Expressed and characterized zinc finger-containing fusion proteins for DNA origami functionalization.

Undergraduate Research Assistant, Chair of Biotechnology, Microbiology and Food Safety, Biotechnical Faculty, Ljubljana, Slovenia (Oct 2009–Apr 2010)
Laboratory of Prof. Hrvoje Petković, Ph.D. Involved in a project that aimed to establish an industrially important bacterial strain less susceptible to hypoxia by incorporating a bacterial haemoglobin gene into its genome.

Undergraduate Research Assistant, Chair of Food Chemistry and Biochemistry, Biotechnical Faculty, Ljubljana, Slovenia (Oct 2008–Apr 2009)
Laboratory of Prof. Nataša Poklar Ulrih, Ph.D. Performed research on α-synuclein-liposome interactions.

Undergraduate Research Assistant, IMI - Institute of Microbiology and Immunology, Faculty of Medicine, Ljubljana, Slovenia (July 2007–Aug 2007).
Laboratory of Prof. Miroslav Petrovec, MD. Used qPCR to compare DNA extraction efficiencies of two automatic DNA extraction devices.

Professional Development

Material Research Society (MRS) Science Writing Workshop, Boston, MA (11/29/2015)
Learnt about key elements of storytelling, their translation to scientific writing, and conducting an interview with a scientist.

Discover Management Program (DMP), Bled, Slovenia (July 2011)
International summer school in economics and project management.

"S(t)imulating life!", KTH - Royal Institute of Technology, Stockholm, Sweden (June 2011)
International summer school in systems biology, bioinformatics, protein structure, molecular modelling, transcriptional regulation and quantum chemistry.

Regional BioCamp, LEK - a Sandoz Company, Ljubljana, Slovenia (May 2011)
International meeting of 35 most perspective young life scientists in the Alpe-Adria region including a workshop on Technology Transfer in biotech.

Research Interests

1. Molecular mechanisms behind intricate nanoscale patterning of natural biomaterials with a present focus on **biomineralization in diatoms**.
2. **Marine microbiology** and **silicon biogeochemistry**.
3. Metabolism and regulation of **polyamines**.

Grants and Funding

The Gordon and Betty Moore Foundation Grant GBMF4958 awarded to Prof. Julie Theriot (Stanford University), Prof. Andrew Fire (Stanford University) and Prof. Pamela Silver (Harvard University) (July 2015, $401,010).
I have co-written a 2-year grant with James Russel - a Ph.D. Candidate in Prof. Julie Theriot's laboratory - to develop new molecular tools for diatom research and engineering. My focus is on applying spatial proteomics techniques to map diatom proteomes.

Research Skills

Laboratory
Molecular cloning • Recombineering • Bacterial, yeast and microalgal culture • SDS-PAGE • Western blot • Protein purification • Electrophoretic Mobility Shift Assay (EMSA) • (Fluorescence) spectroscopy • Luminometry • Metabolite extraction (violacein, resveratrol and carotenoids) • Laser scanning confocal microscopy (LSCM) • Total internal reflection fluorescence (TIRF) microscopy • Dynamic light scattering (DLS) and circular dichroism (CD) of protein samples • RNA isolation and cDNA library preparation

Some hands-on laboratory experience also with:
DNA microarrays • Plant and mammalian tissue culture • qPCR • Liposome preparation • Microscale thermophoresis (MST)

Computer
General: Microsoft Office 2010 Word, Excel, PowerPoint, OneNote
Graphics: GIMP, Inkscape
Bioinformatics: Vector NTI, Geneious
Molecular visualization tools: Chimera, PyMOL
Programming and statistics: Basic knowledge of UNIX, R, MATLAB and Python

Teaching and Outreach

Science in the News (SITN) Waves Correspondent (Sep 2015–)
Writing short articles on trending science after consulting with experts in relevant fields.

Biochemistry Bootcamp Mentor, Wellesley College, Wellesley, MA (Jan 2015)
Mentor for the inaugural biochemistry bootcamp aimed at promising undergraduates at Wellesley College. Students expressed a protein in bacteria, purified it, assayed its activity, and presented their findings to their classmates. I directly supervised a pair of undergraduate participants. The administrators at Wellesley agreed to offer this bootcamp opportunity to students again in 2016.

Publications

Peer Reviewed Journals
Conrado R.J., Wu G.C., Boock J.T., Xu H., Chen S.Y., Lebar T., **Turnšek J.**, Tomšič N., Avbelj M., Gaber R., Koprivnjak T., Mori J., Glavnik V., Vovk I., Benčina M., Hodnik V., Anderluh G., Dueber J.E., Jerala R., DeLisa M.P. DNA-guided assembly of biosynthetic pathways promotes improved catalytic efficiency. Nucleic Acids Research, 2012, vol. 40, no. 4: pp. 1879–1889

Patents
Jerala R., Avbelj M., Benčina M., Mori J., Gaber R., Koprivnjak T., Anderluh G., Vovk I., Lebar T., **Turnšek J.**, Ilc T., Tomšič N., Stošicki T., Žnidarič M., Bordon J., Pettroni M., Glavnik V. Improved synthesis of biosynthetic products by ordered assembly of biosynthetic enzymes guided by the nucleotide sequence motif template: patent: SI23510 (A), 2012-04-30. Ljubljana, The Slovenian Intellectual Property Office, 2012: 100 pp.

Popular Writing

Turnšek, J. Going with the Flow: New Evidence for Liquid Water on Mars. Science in the News (SITN) Wave (available online at http://sitn.hms.harvard.edu/waves/2015/water_mars/)

Turnšek, J. Diatoms: Nature's nanotechnologists. Science in the News (SITN) Art (available online at http://sitn.hms.harvard.edu/art/2014/diatoms-natures-nanotechnologists/)

Turnšek, J. DNA Sciku. Science in the News (SITN) Art (available online at http://sitn.hms.harvard.edu/uncategorized/2014/dna-sciku/)

Turnšek, J. Slovenski uspeh na tekmovanju iz biomolekularnega dizajna BIOMOD 2011. Proteus, vol. 75, no. 8: pp. 347–352 (in Slovene; **Kavčič Award**)

Jerala R., Gaber R., Mori J., **Turnšek J.** Synthetic Biology: from Nanoscale to the Molecular Assembly Line. Quark - Research and Development in Slovenia, Summer 2012: pp. 20–23

Conferences and Meetings

A New Age of Discovery for Aquatic Microeukaryotes, Heidelberg, Germany (01/26/2016–01/29/2016)
Spatial Proteomics in Diatoms: Towards a Systems View of Biosilicification and Beyond (Poster)

Wyss Institute 7th Annual Retreat, Boston, MA (11/19/2015)
Biomineralization in Diatoms: Using Spatial Proteomics to Reveal Unknown Players (Poster)

Molecular Life of Diatoms 2015, Seattle, WA (07/07/2015–07/10/2015)
Size- and shape-constrained synthesis of nanomaterials using biofilms and viral capsids (Poster)

2014 MRS Fall Meeting and Exhibit, Boston, MA (11/30/2014–12/05/2014)

4th ISS - International Summer School, Piran, Slovenia (08/27/2011)
2010 Slovenian iGEM Project (Invited talk)

6th CeBiTec Symposium Genome-Based Microbiology: From -omics Research to Systems and Synthetic Biology, Bielefeld, Germany (07/20/2011)
Slovenian iGEM Projects (Invited talk)

1st Bio:Fiction, Science, Art and Film Festival, Vienna, Austria (05/13/2011)
Participated in the "Do it yourself Biology and Biohackers: Facts and Fiction" panel session which included a short presentation of the iGEM and the idea behind it.

iGEM 2010 Jamboree, Cambridge, MA (11/06/2010 & 11/08/2010)
DNA coding beyond triplets (Grand Prize winning iGEM project talks)

Memberships

MIT Triathlon Club (2016–) • Harvard University Cycling Association (HUCA) (2015–; Social Media Officer) •"VTIS" - Association of Slovenes Educated Abroad (2014–) • Harvard Triathlon Team (2014–) • MIT European Club (2012–) • Genetic Society of Slovenia (2012–) • Slovenian Biochemical Society (2011–)

Languages

Slovenian (Native tongue) • English (Full professional proficiency) • German (Limited working proficiency) • Spanish (Elementary proficiency)

Interests and Hobbies	Space exploration • Triathlon • Sports technology industry • Traveling • Electronic music • Collecting vinyl records