




RNDr. Miroslav Gančár, PhD.

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● WORK EXPERIENCE

JUNE 2022 – JULY 2022

WORK/STUDY STAY: Institute of Nanostructured Materials, Consiglio Nazionale Delle Ricerche, Bologna, Italy
(6-week scholarship granted by ACRI CYCLONET 2019 YTIP scheme)

SEPTEMBER 2021 – JANUARY 2022

WORK/STUDY STAY: Institute of Nanostructured Materials, Consiglio Nazionale Delle Ricerche, Bologna, Italy
(5-month scholarship granted by National scholarship program - SAIA)

SEPTEMBER 2020 – CURRENT

RESEARCHER: Institute of Experimental Physics, Department of Biophysics, Slovak Academy of Sciences, Košice, Slovakia (full-time employment)

FEBRUARY 2020

WORK/STUDY STAY: Institute of Nanostructured Materials, Consiglio Nazionale Delle Ricerche, Bologna, Italy
(1-month scholarship granted by National scholarship program - SAIA)

● EDUCATION AND TRAINING

2016 – 2020

Ph.D. STUDY IN BIOPHYSICS (EQF level 8) – Pavol Jozef Šafárik University in Košice, Faculty of Science, Department of Biophysics and Institute of Experimental Physics, Department of Biophysics, Slovak Academy of Sciences in Košice, Slovakia

DISSERTATION THESIS – Amyloid self-assembly of proteins

- *in vitro* study of protein amyloid self-assembly (conformational changes, kinetics, mechanism)
- design and evaluation of potential amyloid inhibitors (small organic molecules, multi-target directed ligands, surface modified nanoparticles)

SUPERVISOR – doc. RNDr. Zuzana Gažová, CSc.

2014 – 2016

MASTER'S STUDY IN BIOCHEMISTRY (EQF level 7) – Pavol Jozef Šafárik University in Košice, Faculty of Science, Department of Biochemistry

MASTER THESIS – Catalytic properties of glucose oxidase

- research of the catalytic properties of glucose oxidase for biosensor production
- detailed examination of glucose oxidation mechanism - implementation of potentiometry and fluorimetry for the determination of glucose content in sweetened solutions and soda

SUPERVISOR – RNDr. Rastislav Varhač, PhD.

● RESEARCH INTEREST

- My research focuses on several different aspects of protein amyloid aggregation – specific poly/peptide self-assembly process associated with the pathogenesis of many diseases such as Alzheimer's and Parkinson's diseases and diabetes type II.
- The understanding of the amyloid aggregation of poly/peptides: (a) the specific mechanisms of poly/peptide aggregation, (b) the hierarchical structure of the poly/peptide amyloids from the atomistic to mesoscopic scale and (c) the physical properties of the amyloids in the context of their surrounding environment (biological or artificial).
- Self-assembled poly/peptide amyloid nanostructures.
- Study of low-molecular substances counteracting amyloid aggregation for their ability (a) to stabilize toxic amyloid precursors; (b) to prevent the growth of toxic oligomers; (c) to inhibit fibril growth and deposition; (d) to disassemble preformed fibrils; and (e) to favour amyloid clearance.
- Of particular interest is the surface-modified nanoparticles' role in the depolymerization of amyloid aggregates or amyloid aggregation inhibition.

● EXPERIMENTAL SKILLS AND EXPERIENCE

- State-of-the-art instrumentation for biological imaging and protein structural and functional analysis.
- Preparation of protein amyloid aggregates (globular and intrinsically disordered proteins) in broad spectra of experimental conditions.
- Spectral methods for protein (examining conformation changes) and compounds (small organic molecules, nanoparticles) characterization.
 - Differential scanning microcalorimeter, Isothermal titration calorimeter
 - ATR-Fourier transform infrared spectroscopy
 - CD spectropolarimeter-circular dichroism
 - UV-VIS spectrophotometer,
 - Fluorescence spectroscopy (intrinsic fluorescence, fluorescent probes)
- Atomic force microscopy (air, fluid cell)
- Optical, Fluorescence/Polarization microscopy
- Enzymatic assays - BACE1, gamma-secretase ELISA
- Polyacrylamide Gel Electrophoresis - native, SDS, tricine
- Experimental data evaluation and analysis

● PERSONAL SKILLS

• LANGUAGE SKILLS

Mother tongue(s): SLOVAK

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	<i>Listening</i>	<i>Reading</i>	<i>Spoken production</i>	<i>Spoken interaction</i>	
ENGLISH	B2 - independent user	B2 - independent user	B2 - independent user	B2 - independent user	B2 - independent user
GERMAN	A1 - basic user	A1 - basic user	A1 - basic user	A1 - basic user	A1 - basic user

• COMMUNICATION SKILLS

- Teamwork
 - Mediation
 - Cross-Cultural Communication
 - Open-Mindedness
 - Presentation
 - Public Speaking
 - Friendliness
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• ORGANIZATION AND MANAGEMENT

- Publication of scientific results in international or domestic scientific journals
- Formulation of project proposals
- Active presentation of results at home and foreign scientific conferences
- Master's thesis consultant specialist – Mgr. Andrea Kováčová
- Member of the conference organizing committee – Structure and Stability of Biomacromolecules, Košice, Slovakia (2017 & 2019) and 3rd NGP-Net Symposium on Non-Globular Proteins, Košice, Slovakia (2017)

MEMBERSHIPS

- European Biophysical Societies Association
 - Slovak Biophysical Society
 - Member of the local sports (floorball) club - Yellow Snow Košice
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PROFESSIONAL SKILLS

- Technical skills – computer assembly (hardware), bicycles and electric scooters
- Computer skills – competent with most graphic, text processors and analysis software (SigmaPlot, Origin, Gwyddion)

PUBLICATIONS

- Antosova, A., **Gancar, M.**, Bednarikova, Z., Marek, J., Bystrenova, E., & Gazova, Z. *The influence of cations on α -lactalbumin amyloid aggregation.* JOURNAL OF BIOLOGICAL INORGANIC CHEMISTRY, 27(7), 679-689, (2022)
- Antosova, A., **Gancar, M.**, Bednarikova, Z., Marek, J., Zahn, D., Dutz, S., & Gazova, Z. *Surface-modified magnetite nanoparticles affect lysozyme amyloid fibrillization.* BIOCHIMICA ET BIOPHYSICA ACTA (BBA)-GENERAL SUBJECTS, 1865(9), 129941, (2021)
- Spodniakova, B., Bednarikova, Z., **Gancar, M.**, Antosova, A., Hamulakova, S., & Gazova, Z. *Bis-coumarin homodimers - towards understanding of anti-amyloid potential on globular and intrinsically disordered proteins.* EUROPEAN BIOPHYSICS JOURNAL WITH BIOPHYSICS LETTERS, (Vol. 50, pp. S124-S124), (2021, July)
- Antosova, A., **Gancar, M.**, Bystrenova, E., Bednarikova, Z., Marek, J., & Gazova, Z. *Effect of Hofmeister cations on α -lactalbumin amyloid fibrillization.* EUROPEAN BIOPHYSICS JOURNAL WITH BIOPHYSICS LETTERS, (Vol. 50, pp. S120-S120), (2021, July)
- Bednarikova, Z., **Gancar, M.**, Wang, R., Zheng, L., Tang, Y., Luo, Y., ... & Gazova, Z. *Extracts from Chinese herbs with anti-amyloid and neuroprotective activities.* INTERNATIONAL JOURNAL OF BIOLOGICAL MACROMOLECULES, 179, 475-484, (2021)
- **Gancar, M.**, Kurin, E., Bednarikova, Z., Marek, J., Mucaji, P., Nagy, M., & Gazova, Z. *Amyloid Aggregation of Insulin: An Interaction Study of Green Tea Constituents.* SCI. REPORTS, 10 (1), 1-12, (2020)
- **Gancar, M.**, Ho, K., Mohid, S. A., Thai, N. Q., Bednarikova, Z., Nguyen, H. L., ... & Gazova, Z. *7-Methoxytacrine and 2-Aminobenzothiazole Heterodimers: Structure–Mechanism Relationship of Amyloid Inhibitors Based on Rational Design.* ACS CHEMICAL NEUROSCIENCE, 11 (5), 715-729, (2020)
- Gazova, Z., Bednarikova, Z., **Gancar, M.**, Ulicna, K., Fedunova, D., Wang, S. S. S., ... & Zeng, B. B. *Effect of natural and synthetic small molecules on aggregation of globular proteins.* EUROPEAN BIOPHYSICS JOURNAL WITH BIOPHYSICS LETTERS (Vol. 48, pp. S86-S86), (2019, July)
- **Gancar, M.**, Bednarikova, Z., Ulicna, K., Ho, K., Nguyen, H. L., Nguyen, T. Q., ... & Gazova, Z. *MEOTA-BTZ derivatives inhibit amyloid aggregation of lysozyme in linker-length dependent manner.* EUROPEAN BIOPHYSICS JOURNAL WITH BIOPHYSICS LETTERS (Vol. 48, pp. S81-S81), (2019, July)
- Thai, N. Q., Bednarikova, Z., **Gancar, M.**, Linh, H. Q., Hu, C. K., Li, M. S., & Gazova, Z. *Compound CID 9998128 Is a Potential Multitarget Drug for Alzheimer's Disease.* ACS CHEMICAL NEUROSCIENCE, 9 (11), 2588-2598, (2018)
- **Gancar, M.**, Bednarikova, Z., Wang, R., Ma, L., Fedunova, D., Tang, Y., ... & Gazova, Z. *An effect of small compounds from traditional Chinese herbs on A beta 42 aggregation in AD.* EUROPEAN BIOPHYSICS JOURNAL WITH BIOPHYSICS LETTERS (Vol. 46, pp. S238-S238), (2017, July)

● CONFERENCES AND MEETINGS

• ORAL PRESENTATION

- Meeting of Ph.D. students dedicated to the memory of academician Boďa, XII. year, Košice, Slovakia, September 2017
- PREVEDA: Interactive Young Scientists Conference, Bratislava, Slovakia, August 2018
- 11th International Conference Structure and Stability of Biomacromolecules, Košice, Slovakia, September 2019
- Young researcher under 35 y/o meeting, Institute of Experimental Physics SAS, Košice, December 2020
- 10th Slovak Biophysical Symposium, Smolenice, Slovakia, May 2022
- Young researcher under 35 y/o meeting, Institute of Experimental Physics SAS, Košice, December 2022

• POSTER PRESENTATION

- EBSA & IUPAB Congress, Edinburgh, Scotland, July 2017
- 3rd NGP-Net Symposium on Non-Globular Proteins, Košice, Slovakia, September 2017
- 10th International Conference Structure and Stability of Biomacromolecules, Košice, Slovakia, September 2017
- NGP-net Winter School on Experimental Methods for Protein Disorder & Aggregation, Marseille, France, February 2017
- 8th Slovak Biophysical Symposium, Košice, Slovakia, May 2018
- 4th NGP-NET Symposium on Non-globular proteins, Druskininkai, Lithuania, September 2018
- NGP-net Winter School on Experimental Methods for Protein Disorder & Aggregation, Brno, Czech Republic, January 2019
- EBSA IUPAP Congress, Madrid, Spain, July 2019
- 9th Slovak Biophysical Symposium, Trnava, Slovakia, September 2020
- 10th Slovak Biophysical Symposium, Smolenice, Slovakia, May 2022
- 9th Scandinavian and Baltic Conference: Amyloid Diseases and Amyloid Mechanisms "ADAM₉", November 2022

● HONOURS, AWARDS AND TRAVEL GRANTS

- Supported candidate of Štefan Schwarz Support Fund 2022
- Young researcher under 35 y/o award, Institute of Experimental Physics SAS, Košice, 2022
- The 2021 award of the Slovak Academy of Sciences for the scientific results won by the team Amyloid Structures of Proteins from the Department of Biophysics IEP SAS, composed of Dr. Antošová, Dr. Bednáriková, Dr. Fedunová, Dr. Gančár, and Dr. Marek under the guidance of Prof. Gažová
- Young researcher trainee program CYCLONET 2019
- National scholarship program SAIA – work/study stay: Institute of Nanostructured Materials, Consiglio Nazionale Delle Ricerche, Bologna, Italy, 2021
- Young researcher under 35 y/o award, Institute of Experimental Physics SAS, Košice, 2020
- National scholarship program SAIA – work/study stay: Institute of Nanostructured Materials, Consiglio Nazionale Delle Ricerche, Bologna, Italy, 2020
- Travel grant - NGP - net Winter School on Experimental Methods for Protein Disorder & Aggregation - CEITEC, Brno, 2019
- Young Scientists Award for Best Conference Lecture Structure and Stability of Biomacromolecules, 2019
- The prize for the best contribution of the 10th Interactive Conference of Young Scientists, PREVEDA, 2018
- Travel grant for young researchers - participation in the 19th International Biophysical Congress (IUPAB), Edinburgh, 2017
- Award for the best contribution at the meeting of Ph.D. students dedicated to the memory of academician Boďa, Košice, 2017