Curriculum Vitae

Paweł Dąbrowski-Tumański

Date of birth	19.11.1989
Nationality	Polish
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Education and degrees

2014 – … PhD studies, Chemistry Department University of Warsaw

2013 – 2014 Graduate studies, College of Inter-faculty Individual Studies in Mathematics and Natural Sciences, University of Warsaw, main field - Physics, specialty Biophysics;

2012 – 2013 Graduate studies, Department of Mathematics, Informatics and Mechanics, University of Warsaw, Specialty Topology and Geometry of Manifolds;

2011 – 2013 Graduate studies, College of Inter-faculty Individual Studies in Mathematics and Natural Sciences, University of Warsaw, main field - Chemistry, specialty Organic Chemistry;

- **MSc degree with honors in Organic Chemistry** (2013); Thesis entitled "*Studies on fast and efficient method of nucleotide sugar synthesis and using this method to obtain nucleotide sugar analogues modified in diphosphate bridge*" (in polish)

2008 – 2012 Undergraduate studies, College of Inter-faculty Individual Studies in Mathematics and Natural Sciences, University of Warsaw, main fields – Chemistry and Mathematics;

- **BSc degree in Mathematics** (2012); Thesis entitled "*Metric spaces with FDC property*" (in polish)
- **BSc degree in Chemistry** (2011); Thesis entitled "*Studies on efficient method of nucleotide sugar synthesis*" (in polish)

Scientific experience in short

- 16 articles, 4 conference papers;
- 3 invited lectures, 8 other oral presentations;
- Main organizer of 1 conference, Discussion Leader on 1 conference;
- Author or co-author of 36 conference posters;
- 3 foreign internships;
- Work in field of complex topology proteins, protein molecular dynamics; nucleotides, nucleotide sugars, organic synthesis, spectroscopy;
- Grant leader of Polish Science Foundation and Polish National Science Centre; participant in Polish National Science Centre, Foundation for Polish Science, Polish Ministry for Science and Higher Education and European Molecular Biology Organization grants.

Foreign languages

English – advanced (CAE, 2007), German – semi-advanced, Russian – basic, Norwegian – basic, French – basic.

List of publications

1. Gierut A, Dabrowski-Tumanski P, Niemyska W, Millett KC, Sulkowska JI (2019) PyLink: a PyMOL plugin to identify links, *Bioinformatics*, bty1038;
2. Dabrowski-Tumanski P, Rubach P, Goundaroulis D, Dorier J, Sułkowski P, Millett KC, Rawdon EJ, Stasiak A, Sulkowska JI (2019) KnotProt 2.0: a database of proteins with knots and other entangled structures, *Nucleic Acids Research,* 47, D367-D375;
3. Zajac S, Geary C, Andersen ES, Dabrowski-Tumanski P, Sulkowska JI, Sułkowski P (2018) Genus trace reveals the topological complexity and domain structure of biomolecules, *Scientific Reports*, 8, 17537;

4. Dabrowski-Tumanski P, Sulkowska JI (2018) The APS-bracket – A topological tool to classify lasso proteins, RNAs and other tadpole-like structures. *Reactive and Functional Polymers*, 132, 19-25;
5. Dabrowski-Tumanski P, Piejko M, Niewieczerzal S, Stasiak A, Sulkowska JI (2018) Protein Knotting by Active Threading of Nascent Polypeptide Chain Exiting From the Ribosome Exit Channel. *Journal of Physical Chemistry B,* 122(49), 11616-11625;
6. Jarmolinska AI, Kadlof M, Dabrowski-Tumanski P, Sulkowska JI (2018) GapRepairer–a server to model a structural gap and validate it using topological analysis, *Bioinformatics*, 34(19), 3300-3307;
7. Zhao Y, Dabrowski-Tumanski P, Niewieczerzal S, Sulkowska JI (2018) The exclusive effects of chaperonin on the behavior of proteins with 5_2 knot. *PLoS Computational Biology*, 14(3), e1005970;
8. Dabrowski-Tumanski P, Sulkowska JI (2017) To tie, or not to tie? That is the question. *Polymers,* 9(9), 454;
9. Gierut A, Niemyska W, Dabrowski-Tumanski P, Sułkowski P, Sulkowska JI (2017) PyLasso – a PyMOL plugin to identify lassos. *Bioinformatics*, 33(23), 3819-3821;
10. Dabrowski-Tumanski P, Sulkowska JI (2017) Topological knots and links in proteins. *PNAS*, 114(13), 3415-3420.
11. Niemyska W, Dabrowski-Tumanski P, Kadlof M, Haglund E, Sułkowski P, Sulkowska JI (2016) Complex lasso: new entangled motifs in proteins. *Scientific Reports*, 6: 36895.
12. Dabrowski-Tumanski P, Jarmolinska AI, Niemyska W, Rawdon EJ, Millett KC, Sulkowska JI (2016) LinkProt: a database collecting information about biological links. *Nucleic Acids Research*, 45(D1), D243-D249.
13. Dabrowski-Tumanski P, Niemyska W, Pasznik P, Sulkowska JI (2016) LassoProt: server to analyze biopolymers with lassos. *Nucleic acids research*, 44(W1), W383-W389.
14. Dabrowski-Tumanski P, Stasiak A, Sulkowska JI (2016) In Search of Functional Advantages of Knots in Proteins. *PloS one*, 11(11), e0165986.
15. Dabrowski-Tumanski P, Jarmolinska AI, Sulkowska JI (2015). Prediction of the optimal set of contacts to fold the smallest knotted protein. *Journal of Physics: Condensed Matter*, 27(35), 354109.
16. Dabrowski-Tumanski P, Kowalska J, Jemielity J (2013) Efficient and rapid synthesis of nucleoside diphosphate sugars from nucleoside phosphorimidazolides. *European Journal of Organic Chemistry*, 2013(11), 2147-2154.

List of conference papers

1. Dabrowski-Tumanski P, Zhao Y, Niewieczerzal S (2017) Parallel folding pathways of UCH-L1-protein with Gordian knot-differ in topology of intermediate. *European Biophysics Journal with Biophysics Letters* 46, S212-S212
2. Dabrowski-Tumanski P, Sklodowski M, Sulkowska JI (2016) Current approaches to disentangle the mystery of knotted protein folding. *TASK Quarterly* 20(4), 361-371.
3. Dabrowski-Tumanski P, Osowniak A, Kowalska J, Jemielity J (2015*)* Synthesis of nucleotide sugars and nucleoside 5'-phosphosulfates by $MgCl_2$ mediated coupling*. Collection of Czechoslovak Chemical Communications*, 12, 354-356.
4. Dabrowski-Tumanski P, Niewieczerzal S, Sulkowska JI (2014) Determining Critical Amino Acid Contacts for Knotted Protein Folding. *TASK Quarterly* 18(3), 265–279.

Organization experience

6-7.01.2018 Co-chair of Gordon Research Seminar on Protein Folding dynamics - From Disorder to Order: Fundamentals, Function and Evolution of Protein Folding

Participation in grants

2017 *„Lassos and links – topological manifolds in biological objects – introduction to nanomedicine*" – Mobilność + grant, Polish Ministry of Science and higher education, Poland, grant amount 422,400 zł (~115,000 $), grant leader - DECLINED.

2017 - … „*Entangled proteins – introduction to nanomedicine*" – Etiuda grant, National Science Centre, Poland, grant amount 115,676 zł (~32,000 $), grant leader.

2017 – … EMBO small grant - European Molecular Biology Organization; investigator (grant leader: Joanna Sulkowska).

2016 – 2019 „*Identification and characterization of proteins with link topology"* – Preludium, National Science Centre, Poland, grant amount 100,000 zł (~28,000 $), grant leader.

2016 – … „Entangled proteins – study on new structures and solving their mysteries" – Ideas Plus, Ministry of Science and Higher Education, Poland; investigator (grant leader: Joanna Sulkowska).

2016 –2017 „*Working on methodology of macromolecular link detection in proteins*" – Grant for Young Scientists, University of Warsaw; grant leader; realized

2015 – 2016 „*Is it possible to catch biology on mathematical lasso? New topological structures in proteins*" – Inter Grant, Fundation for Polish Science; realized (grant leader: Wanda Niemyska).

2015 – 2016 „*Characterization of the structure/function correspondence in complex lasso proteins*" – Grant for Young Scientists, University of Warsaw; grant leader; realized.

2014 – … „*Influence of entangled structure on the function and prediction of structure of proteins*" – Sonata BIS, National Science Centre, Poland; investigator (grant leader: Joanna Sulkowska).

2014 – … EMBO – Installation Grant, European Molecular Biology Organization; investigator (grant leader: Joanna Sulkowska).

2012-2014 „New reagents and methods in synthesis of modified nucleotides and their usefulnes to obtaining biochemical tools and nucleotides with high therapeutical potential" – Sonata BIS, National Science Centre, Poland; investigator (grant leader: Jacek Jemielity).

Awards

- Start stipendist (Foundation for Polish Sciences) 2017;
- Scholarship of the Ministry of Science and Higher Education for PhD students (2017);
- Scholarship of the Ministry of Science and Higher Education (2009, 2012);
- Finalist of the 1st edition of the competition "Chemistry Gold Medal" for the best Bachelor thesis in the field of chemistry;
- 2nd poster award on conference Biomolecules and Nanostructures 5, 13-17.05.2015;
- Travel grant award on The 29th Annual Symposium of The Protein Society, 22-25.07.2015, Barcelona;
- Scholarship of rector for the best student (2012);
- Scholarship of rector for the best PhD student (2014,2015,2018).

List of invited lectures

1. Dabrowski-Tumanski P, Sulkowska JI "Knots and links in proteins – stabilization of virus capsids", Seminar at Los Alamos, New Mexico, USA, 17.01.2018;
2. Dabrowski-Tumanski P, Sulkowska JI "The lassos in proteins – matrix classification and topological distance", The Geometry and Topology of Knotting and Entanglement in Proteins, CMO-BIRS Workshop, Oaxaca, Mexico, 05-10.11.2017;
3. Dabrowski-Tumanski P, Sulkowska JI "Topological knots and links in proteins", Physics and Biology of Proteins workshop, Natal, Brazil, 12-28.06.2017;

List of oral presentations

1. Dabrowski-Tumanski P, Goundaroulis D, Stasiak A, Sulkowska JI „Deterministic knots and θ-curves in proteins", Polymers meet topology, Tokyo, Japan, 30.01-01.02.2019;
2. Dabrowski-Tumanski P, Sulkowska JI "θ-curves in proteins - On the verge of proteins' topological complexity", Knots in Gdansk II, Gdańsk, Poland, 14-15.06.2018;
3. Dabrowski-Tumanski P, Niewieczerzal S, Zhao Y, Sulkowska JI "Two pathways of proteins with Gordian (5_2) knot folding", EMBO Workshop, Serock, Poland, 3-5.03.2017;

4. Dabrowski-Tumanski P, Sulkowska JI "*Topology of proteins with complex lasso structure"*, Knots in Hellas 2016, Ancient Olympia, Greece, 17-23.07.2016;
5. Dabrowski-Tumanski P, Sulkowska JI; *„Complex lasso proteins - how to form a topological link in protein"*, 6th VSSSB, Warsaw, Poland, 19-21.06.2016;
6. Dabrowski-Tumański P, Sułkowska JI; *„Why did the protein pierced the loop?"*, EMBO Workshop, Jabłonna near Warsaw, Poland, 08-10.04.2016;
7. Dabrowski-Tumański P, Sułkowska JI *„Linking proteins with topology"*, EMBO Workshop, Goniądz, Poland, 20-21.01.2015;
8. Dąbrowski-Tumański P, Kowalska J, Jemielity J "*Studies on efficient method of nucelotidesugar synthesis*" (in polish), 55. Meeting of PTChem and SITPChem, Białystok, Poland, 16-20.09.2012.

Experience as session chairman

1. Gordon Research Conference on Protein Folding Dynamics, 7-12.01.2018

List of internships

XI 2017	Internship in Centre for Integrative Genomics, University of Lausanne, Switzerland, host prof. A. Stasiak
VIII 2016	Internship in Centre for Integrative Genomics, University of Lausanne, Switzerland, host prof. A. Stasiak
VII-VIII 2015	Exterior Scientific Colaborator, Centre for Integrative Genomics, University of Lausanne, Switzerland, host prof. A. Stasiak
VII 2014	Department of Biophysics, Faculty of Physics, University of Warsaw, host prof. J. Jemielity
VII 2013	Department of Biophysics, Faculty of Physics, University of Warsaw, host prof. J. Jemielity
VII 2012	Department of Biophysics, Faculty of Physics, University of Warsaw, host prof. J. Jemielity
VII 2011	Department of Biophysics, Faculty of Physics, University of Warsaw, host prof. J. Jemielity
VII 2010	Department of Biophysics, Faculty of Physics, University of Warsaw, host prof. J. Jemielity

Other skills and courses

- Young Investigator Program PhD course (paper writing, oral presentations etc.) – European Molecular Biology Organisation;
- Course in Mathematica, MatLab - Polish Foundation for Sciences;
- Course in autopresentation - Polish Foundation for Sciences;
- Programming (Bash, C, Python, Perl).

List of posters

1. M. Piejko, P. Dabrowski-Tumanski, A. Stasiak, J. I. Sulkowska – „Ribosome-induced protein knotting" – Fourth Polish-Korean Conference on Protein Folding, Iława, Poland, 9-13.08.2018;
2. P. Dabrowski-Tumanski, P. Rubach, J. I. Sulkowska – „Covalent knots in proteins" – Fourth Polish-Korean Conference on Protein Folding, Iława, Poland, 9-13.08.2018;
3. M. Piejko, P. Dabrowski-Tumanski, A. Stasiak, J. I. Sulkowska – „Is the ribosome crucial for proteins' knotting?" – ChemSession'17, Warszawa, Poland, 09.06.2018;
4. A. M. Gierut, W. Niemyska, P. Dabrowski-Tumanski, P. Sułkowski, J. I. Sulkowska – „PyLasso – a PyMOL plugin to identify lassos" – Coarse Graining of Biomolecules and Beyond – Warszawa, Poland, 07.10.2018;
5. P. Dabrowski-Tumanski, J. I. Sulkowska – „UCH-L1, protein with Gordian knot, folds via two paralel, topologically distinct pathways" – EBSA meeting, Edinburgh, Scotland, 16-20.07.2017;

6. P. Dabrowski-Tumanski, J. I. Sulkowska – "*Links in biopolymers – definition and properties*" – Biomolecules and Nanostructures 6, Podlesice near Katowice, Poland, 10-14.05.2017;
7. A. Jarmolinska, P. Dabrowski-Tumanski, W. Niemyska, J. I. Sulkowska – "*LinkProt: a database for links within proteins*" – 9th Symposium of Polish Bioinformatics Society, Białystok, Poland, 28-30.09.2016;
8. W. Niemyska, P. Dabrowski-Tumanski, K. Millett, E. Rawdon, J. I. Sulkowska – "*Complex topology in proteins – Minimal surface, Gauss linking number and HOMFLY polynomial as the tools for studying Lasso and Link structures in proteins*" - Workshop on Knots and Links in Biological and Soft Matter Systems, Triest, Italy, 26-30.09.2016;
9. W. Niemyska, P. Dabrowski-Tumanski, K. Millett, J. I. Sulkowska – "*Minimal surface, Gauss linking number and HOMFLY polynomial as the tools for studying Lasso structures in proteins*" – Knots in Hellas 2016, Ancient Olympia, Greece, 17-23.07.2016
10. A. Nowicka, P. Dabrowski-Tumanski, A. Perlinska, J. I. Sulkowska – *"Molecular dynamics study of decapping scavenger enzyme"* – 6th VSSSB, Warsaw, Poland, 19-21.06.2016;
11. M. Majewski, P. Dabrowski-Tumanski, J. I. Sulkowska – *"An overview of non-trivial topologies predicted in CASP experiment"* – 6th VSSSB, Warsaw, Poland, 19-21.06.2016;
12. A. I. Jarmolinska, M. Kadlof, P. Dabrowski-Tumanski, J. I. Sulkowska – "*GapRepairer: a server for automatic reconstruction of missing parts in protein models - possible aplications"* – 6th VSSSB, Warsaw, Poland, 19-21.06.2016;
13. M. Sklodowski, P. Dabrowski-Tumanski, J. I. Sulkowska – *"Search for optimal contact map in knotted protein folding"* – 6th VSSSB, Warsaw, Poland, 19-21.06.2016;
14. P. Dabrowski-Tumanski, W. Niemyska, J. I. Sulkowska – *„Folding of proteins with topological links"* – Second Polish-Korean Conference on Protein Folding, Gdańsk Leźno, Poland, 28.05-01.06.2016;
15. P. Dabrowski-Tumanski, W. Niemyska, P. Pasznik, J. I. Sulkowska – *„LassoProt-A server and database of proteins with lassos"* - Gordon Research Conference, Protein Folding Dynamics, Galvestone, Texas, USA, 10-15.01.2016;
16. P. Dabrowski-Tumanski, W. Niemyska, P. Sulkowski, J. I. Sulkowska – "*Topological state of proteins with loops*" – La 96ème rencontre entre mathématiciens et physiciens théoriciens aura pour thème : Géométrie et biophysique, Strasboug, France, 17-19.09.2015;
17. P. Dabrowski-Tumanski, A. Jarmolinska, J. I. Sulkowska – "*Prediction of the optimal set of the contacts to fold the smallest knotted protein"* – Geometric energies with links to applications, topology and open problems, Basel, Switzerland, 31.08-3.09.2015;
18. P. Dabrowski-Tumanski, W. Niemyska, M. Kadlof, P. Sulkowski, J. I. Sulkowska – *„Global topology of proteins with (local) complex lasso motif*"- EMBO Young Scientific Forum, Warsaw, Poland, 2-3.07.2015;
19. A. Nowicka, P. Dabrowski-Tumanski, M. Kadlof, Jacek Jemility, J. I. Sulkowska – *„Analysis of functional motions of Decapping Scavenger enzyme using coarse-grained molecular dynamics*" - EMBO Young Scientific Forum, Warsaw, Poland, 2-3.07.2015;
20. P. Dabrowski-Tumanski, A. Jarmolinska, J. I. Sulkowska – "*Prediction of the optimal set of the contacts to fold the smallest knotted protein"* - Biomolecules and Nanostructures 5, Jaroszowice, Poland, 13-17.05.2015;
21. Grzeszczak, P. Dabrowski-Tumanski, J. I. Sulkowska – "*Characteristics of the energy landscape of proteins with non-trivial topology based on tRNA (guanosine-2'-O-) methyltransferase"* - Multi-Pole Approach to Structural Science, Warsaw, Poland, 10-13.05.2015;
22. M. Majewski, P. Dabrowski-Tumanski, M. Kadlof, J. I. Sulkowska – "*Search for non-trivial topology in CASP competition – a key element to improve protein structure prediction"* - Multi-Pole Approach to Structural Science, Warsaw, Poland, 10-13.05.2015;
23. P. Dabrowski-Tumanski, J. I. Sulkowska – "*Minimal contact map as a way to facilitate the protein folding simulations"* - Multi-Pole Approach to Structural Science, Warsaw, Poland, 10-13.05.2015;
24. P. Dabrowski-Tumanski, J. I. Sulkowska – "*Influence of contact map on thermodynamics and folding pathway of 2efv protein"* - 4th Annual CCP-BioSim Conference: Frontiers of Biomolecular Simulation, Leeds, UK, 7-9.01.2015;

25. P. Dabrowski-Tumanski, J. I. Sulkowska – "*How to detect experimentally knots in proteins"* - Significance of Knotted Structures for Function of Proteins and Nucleic Acids, Biophysical Society Thematic Meeting, Warsaw, Poland, 17-21.09.2014;
26. P. Dabrowski-Tumanski, J. I. Sulkowska – "*Theoretical investigation of folding/unfolding of knotted proteins"* – Knots in Soft Condensed Matter, CECAM meeting, Vienna, Austria, 10-13.09.2014;
27. P. Dabrowski-Tumanski, J. Kowalska, J. Jemielity – "*Synthesis of new nucleotidesugar analogs modified in the phosphate bridge"* (in polish)– 57th Meeting of PTChem and SITPchem, Częstochowa, Poland, 14-18.09.2014;
28. P. Dąbrowski-Tumański, J. Kowalska, J. Jemielity; "*Synthesis of new nucleotide sugar analogs modified within the diphosphate bridge*", XVth Tetrahedron Symposium, London, UK, 24-27.06.2014;
29. Grzeszczak, P. Dabrowski-Tumanski, J. Sulkowska; "*Characteristics of reversibility of folding and stability of knotted proteins with computer simulations*", From Computational Biophysics to Systems Biology (CBSB14), Gdansk, Poland, 25-27.05.2014;
30. P. Dabrowski-Tumanski, J. Sulkowska; „*The first theoretical method of empirical detection of protein knots"*, From Computational Biophysics to Systems Biology (CBSB14), Gdansk, Poland, 25-27.05.2014;
31. P. Dąbrowski-Tumański, J. Kowalska, J. Jemielity; „*Studies on fast and efficient method of nucleotidesugar synthesis and use it to obtain nucleotidesugar analogs modified in diphosphate bridge*" (in polish), 56th Meeting of PTChem and SITPChem, Siedlce, Poland, 16-20.09.2013;
32. P. Dabrowski-Tumanski, J. Kowalska, J. Jemielity; „*Universal method for the synthesis of nucleotide sugars and their analogs modified with phosphorotioate moiety at the alpha position of the disphospahte bridge*" XIVth Tetrahedron Symposium, Vienna, Austria, 25-28.06.2013;
33. P. Dąbrowski-Tumański, J. Kowalska, J. Jemielity; *Studies on fast and efficient method of nucleotidesugar synthesis and use it to obtain nucleotidesugar analogs modified in diphosphate bridge*" (in polish), Polish Symposium of Young Chemists, Białystok, Poland, 17-19.05.2013;
34. P. Dabrowski-Tumanski, J. Kowalska, J. Jemielity; „*New, universal method of nucleotide sugar synthesis*", XIIIth Tetrahedron Symposium, Amsterdam, Netherlands, 26-29.06.2012;
35. P. Dąbrowski-Tumański, J. Kowalska, J. Jemielity; „*Studies on new nucleotidesugars synthesis method*" (in polish), 54th Metting of PTChem and SITPChem, Lublin, Poland, 16-20.09.2011;
36. P. Dąbrowski-Tumański, J. Kowalska, A.M. Rydzik, E. Darżynkiewicz, J. Jemielity; „*Universal method of pirophosphate bond formation with the use of phosoran P-imidazolides and the use of the method to obtain the biologically relevant nucleotides*" (in polish), 53th Metting of PTChem and SITPChem, Gliwice, Poland, 14-18.09.2010;

Science popularization

- Organizer of popular science classes during days of University Campus (08.04.2017);
- Organizer of a course for talented youth in computational biophysics (03-07.06.2016);
- Member (2009-2014) and head (2011-2013) of the scientific organization "*NUKLEOTYD";*
- Organization (two times) and participation (five times) of chemical experiments exhibition booth;
- Partition in popular science program in *Polish Radio 4* and in *Academic Radio Campus*.

Hobbys and activities

- Hiking, mountaineering, travelling, running;
- Reading;
- Sports;
- Piano and guitar playing.