

Curriculum Vitae

Anna Ochab-Marcinek, Ph. D. (dr hab.)

Date of birth February 2, 1978

Affiliation Biophysical Chemistry Group
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Employment and professional experience

- May 2018 – present Principal Investigator (*Kierownik Zespołu Tematycznego*) at the Biophysical Chemistry Group (as *Specjalista*), Biophysical Chemistry Group, Department of Soft Condensed Matter, Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, Poland
- 08 Oct 2018 Habilitation in chemistry, Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, Poland
- Jan 2013 – Apr 2018 Principal Investigator (*Kierownik Zespołu Tematycznego*) at the Biophysical Chemistry Group (as *Adiunkt*), Biophysical Chemistry Group, Department of Soft Condensed Matter, Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, Poland
- May 2009 – Dec 2012 Postdoc (as *Adiunkt*), Department of Soft Condensed Matter, Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, Poland
- Apr 2009 Postdoc (as *Specjalista*), Department of Soft Condensed Matter, Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, Poland
- Oct 2007 – Sep 2008 Postdoc (as *Wissenschaftliche Mitarbeiterin*), Lehrstuhl für Theoretische Physik I, Institut für Physik, Mathematisch-Naturwissenschaftlich-Technische Fakultät, Universität Augsburg, Augsburg, Germany
- Oct 2006 – Sep 2009 *Asystent*, Department of Statistical Physics, M. Smoluchowski Institute of Physics, Jagiellonian University, Kraków, Poland
- 2008 - 2010 Head of a popular-science authors team writing blog and texts for *Tygodnik Powszechny* weekly (one of the most recognized and reputable social and cultural weekly magazines in Poland)
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Research interests

- Modeling of biological evolution
 - Stochastic modeling of gene expression
 - Diffusion in a crowded environment
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Publications

1. A. Ochab-Marcinek, J. Jędrak, M. Tabaka, *Hill kinetics as a noise filter: The role of transcription factor autoregulation in gene cascades*, Phys. Chem. Chem. Phys., 2017, 19, 22580-22591
2. G. Angulo, J. Jedrak, A. Ochab-Marcinek, P. Pasitsuparoad, C. Radzewicz, P. Wnuk, A. Rosspeintner, *How good is the generalized Langevin equation to describe the dynamics of photo-induced electron transfer in fluid solution?*, J. Chem. Phys. 146 (2017) 244505
3. J. Jędrak, A. Ochab-Marcinek, *Influence of gene copy number on self-regulated gene expression*, J. Theor. Biol., 2016, 408, 222-236
4. J. Jędrak, A. Ochab-Marcinek, *Time-dependent solutions for a stochastic model of gene expression with molecule production in the form of a compound Poisson process*, Phys. Rev. E, 2016, 94, 032401
5. T. Kalwarczyk, K. Sozański, A. Ochab-Marcinek, J. Szymański, M. Tabaka, S. Hou, R. Holyst, *Motion of nanoprobe in complex liquids within the framework of the length-scale dependent viscosity model*, Advances in Colloid and Interface Science, 2015, 223, 55-63
6. A. Ochab-Marcinek, M. Tabaka, *Transcriptional leakage versus noise: A simple mechanism of conversion between binary and graded response in autoregulated genes*, Phys. Rev. E, 2015, 91(1), 012704
7. K. Sozanski, A. Wisniewska, T. Piasecki, K. Waszczuk, A. Ochab-Marcinek, T. Gotszalk, R. Holyst, *Depletion Layer in Polymer Solutions at an Interface Oscillating at the Subnano-to Submicrometer Scale*, Soft Matter 2014, 10, 7762-7768
8. T.K. Piskorz, A. Ochab-Marcinek, *A Universal Model of Restricted Diffusion for Fluorescence Correlation Spectroscopy*, J. Phys. Chem. B, 2014, 118 (18), 4906-4912
9. A. Lewandowska, A. Majcher, A. Ochab-Marcinek, M. Tabaka, R. Holyst, *Taylor Dispersion Analysis in Coiled Capillaries at High Flow Rates*, Analytical Chemistry 2013, 85 (8), 4051-4056
10. A. Ochab-Marcinek, S.A. Wiczorek, N. Ziębacz, R. Holyst, *The effect of depletion layer on diffusion of nanoparticles in solutions of flexible and polydisperse polymers*, Soft Matter 2012, 8, 11173-11179
11. A. Ochab-Marcinek, R. Holyst, *Scale-dependent diffusion of spheres in solutions of flexible and rigid polymers: mean square displacement and autocorrelation function for FCS and DLS measurements*, Soft Matter 7 (2011) 7366-7374
12. A. Ochab-Marcinek, M. Tabaka, *Bimodal gene expression in noncooperative regulatory systems*, PNAS 107(51) (2010) 22096-22101
13. A. Ochab-Marcinek, *Extrinsic noise passing through a Michaelis-Menten reaction: A universal response of a genetic switch*, J. Theor. Biol., 263(4) (2010) 510-520
14. A. Ochab-Marcinek, E. Gudowska-Nowak, E. Nasonova, S. Ritter, *Modelling radiation-induced cell cycle delays*, Rad. Env. Biophys. 48(4) (2009) 361
15. A. Ochab-Marcinek, G. Schmid, I. Goychuk, P. Hanggi, *Noise-assisted spike propagation in myelinated neurons*, Phys. Rev. E 79, 011904 (2009)
16. A. Fiasconaro, A. Ochab-Marcinek, B. Spagnolo, E. Gudowska-Nowak, *Monitoring noise-resonant effects in cancer growth influenced by external fluctuations and periodic treatment*, Eur. Phys. J. B 65, 435-442 (2008)
17. Anna Ochab-Marcinek, *Predicting the asymmetric response of a genetic switch to noise*, J. Theor. Bio. 254 (2008) 37-44
18. B. Spagnolo, A.A. Dubkov, A.L. Pankratov, E.V. Pankratova, A. Fiasconaro, A. Ochab-Marcinek *Lifetime of Metastable States and Suppression of Noise in Interdisciplinary Physical Models*, Acta Physica Polonica B 38(5) 2007, 1925
19. Anna Ochab-Marcinek, Alessandro Fiasconaro, Ewa Gudowska-Nowak, Bernardo Spagnolo, *Coexistence of resonant activation and noise-enhanced stability in a model of tumor-host interaction: Statistics of extinction times*, Acta Physica Polonica B 37(5) 2006, 1651
20. Alessandro Fiasconaro, Bernardo Spagnolo, Anna Ochab-Marcinek, Ewa Gudowska-Nowak, *Co-occurrence of resonant activation and noise-enhanced stability in a model of cancer growth in the presence of immune response*, Physical Review E 74, 041904 (2006)

21. Anna Ochab-Marcinek: *Transient pattern formation in a stochastic model of cancer growth*, *Fluctuation and Noise Letters* 5(2) (2005) L331
22. Anna Ochab-Marcinek: *Pattern formation in a stochastic model of cancer growth*, *Acta Physica Polonica B* 36(6) (2005) 1963
23. Anna Ochab-Marcinek, Ewa Gudowska-Nowak: *Population growth and control in stochastic models of cancer development*, *Physica A*, 343 (2004) 557-572
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Patents

A. Lewandowska, A. Majcher, M. Tabaka, A. Ochab-Marcinek, R. Hołyst *Sposób wyznaczania współczynnika dyfuzji D substancji chemicznej w buforze TRIS (Method for determining chemical diffusion coefficients in the rolled capillary at high flow speed)* patent no. 220250 (Polish Patent Office), application 10.8.2012, patent granted 4.12.2014.

Honours, awards, grants, scholarships

- 15.5.2017-14.5.2021 Awarded the National Science Centre grant SONATA Bis no. 2016/22/E/ST2/00558 (628,200 PLN) for the project: *Evolution of gene regulation as a stochastic process: Savageau's demand theory, cost of regulation and noise*
- 2013 Awarded the Polish Ministry of Science *Iuventus Plus grant no. 0501/IP1/2013/72 (301,600 PLN)* for the project: *Theoretical study of conditions for precise regulation of genes in a 2-gene cascade with autoregulation*
- 2012 Award in the „Young researchers IPC PAS” competition organized by the Institute of Physical Chemistry, Polish Academy of Sciences, for the publications in last 3 years
- 12.2011-12.2014 Awarded the National Science Centre grant SONATA no. 2011/01/D/ST3/00751 (800,000 PLN) for the project: *Transition from nano- to macroviscosity in diffusion of nano particles in a crowded environment: Theoretical and experimental study of the depletion layer effect*
- 2011 1st award in the competition for the best IPC PAS publication of the year 2010, for the paper: A. Ochab-Marcinek, M. Tabaka, *Bimodal gene expression in noncooperative regulatory systems*, *PNAS* 107(51) (2010) 22096-22101
- 8.11.2011-31.10.2014 Awarded the Polish Ministry of Science Scholarship for Outstanding Young Researchers (contract no. 30/E-64/STYP/6/2011)
- 2011 Award in the „Young researchers IPC PAS” competition organized by the Institute of Physical Chemistry, Polish Academy of Sciences, for the publications in last 3 years
- 12.2010-12.2011 Awarded the *Iuventus Plus grant no. IP2010 028870* of Polish Ministry of Science (150,000 PLN) for the project: *Modeling the depletion layer effect in diffusion of nanoparticles in crowded environment*
- 2009 - 2013 Participation in Polish Science Foundation / European Union TEAM grant: *From nano to macroscale: motion of proteins, protein charge ladders and nanoparticles in complex liquids and diffusion limited reactions in crowded environment*
- 2008 Awarded a Highly Commended diploma in the „Popularyzator Nauki 2008” competition organized by Polish Press Agency and Polish Ministry of science, for popular-science articles and blog written for *Tygodnik Powszechny* weekly
- 2008 Participation in the Volkswagen Foundation grant no. I/80424: *New Conceptual Approaches to Modeling and Simulation of Complex Systems*
- 2007-2008 Participation in the German Research Foundation grant: *Nano- und Mikrofluidik: Von den molekularen Bewegung zur kontinuierlichen Strömung*
- 2006 PhD in physics with honours
- 2005-2006 Polish State Committee for Scientific Research grant no. 1P03B15929 (16 000 PLN) for the project *Fluctuations and delays in cell cycle models*
- 2005 ESF STOCHDYN grant no. 785 (895 EUR) for a visit at the Group of Interdisciplinary

	Physics in Palermo, Italy, 1-7 February 2006
2002-2006	Granted a PhD scholarship during all years of study
2002	Graduated with honours in theoretical physics
2000	Granted a TEMPUS Scholarship at Friedrich-Schiller-Universität, Jena, Germany
1998-2002	Granted a Jagiellonian University student scholarship for very good academic results (during all provided years of study: 2nd-5th year)

Invited talks (conferences)

4-5.6.2018	Jędrzej Śniadecki BioMedical Workshop (3rd edition), Bydgoszcz, Poland, Invited talk: <i>Modeling of random fluctuations in gene expression and cell division</i>
6-9.3.2018	Information transmission in biological systems, Będlewo, Poland, I was invited by the conference organizer to co-organize it and to give the invited talk: <i>Bursty gene expression and cell division</i>
3-8.9.2017	30 th Marian Smoluchowski Symposium on Statistical Physics, Kraków, Poland, Invited talk: <i>Stochastic gene expression in cells undergoing division</i>
8-9.12.2016	BIOFIZMAT 5 Workshop, Banach Center, Warsaw, Poland, Invited talk: <i>Modele stochastycznej ekspresji genów z losowymi burzami i deterministycznym rozpadem białek (Models of stochastic gene expression with random bursts and deterministic protein degradation)</i>
15-17.9.2016	7. Forum Matematyków Polskich z Udziałem Matematyków Ukraińskich (7th Forum of Polish Mathematicians with Participation of Ukrainian Mathematicians), Olsztyn, Poland Co-organizer and chairperson of the thematic session <i>Matematyczne modele regulacji genów i szlaków sygnalizacyjnych w komórkach (Mathematical models of gene regulation and signalling pathways in cells)</i> I was invited by the session organizer to co-organize it and to give the invited talk within that session: <i>Gene multiplication: A simple phenomenon that may cause non-intuitive effects</i>
14-17.9.2015	Conference: 28 th Marian Smoluchowski Symposium on Statistical Physics, Kraków, Poland Invited talk: <i>Modeling stochastic gene expression: a few solutions by geometric construction</i>
7.9.2015	43 rd Congress of Polish Physicists, Kielce, Poland Invited talk within the specialistic session <i>Fizyka Statystyczna (Statistical Physics): Modelowanie dyfuzji w zatłoczonym środowisku dla spektroskopii korelacji fluorescencji (Modeling of diffusion in a crowded environment for fluorescence correlation spectroscopy)</i>
11.5.2013	Conference: <i>Biological Complexity in Cracow</i> , Kraków, Poland Invited talk: <i>Gene regulation as a nonlinear noise filter</i>

Popular science publications

For *Tygodnik Powszechny* weekly:

1. Anna Ochab-Marcinek, *Klucz do komórki*, Tygodnik Powszechny 2 (3209), 9.1.2011
2. Anna Ochab-Marcinek, *Geniusz z Wrocławia*, Tygodnik Powszechny 1-2 (3104-05), 4-11.1.2009
3. Anna Ochab-Marcinek, *Patent hochsztaflera* Tygodnik Powszechny 50 (3101) 14.12.2008
4. Anna Ochab-Marcinek, *Doktorat z telepatii*, Tygodnik Powszechny 45 (3096) 9.11.2008
5. Anna Ochab-Marcinek, *Więcej niż mrówek* Tygodnik Powszechny 37 (3088), 14.09.2008

2008-2010: *Świat: Jak to działa?* (World: how does it work?) <http://swiat-jaktodziala.blog.onet.pl>
Popular science blog commenting news in physics, for Tygodnik Powszechny. **10000 visits/month**

For Agora SA (the editor of *Gazeta Wyborcza* and gazeta.pl, the largest daily newspaper and news portal in Poland): Blog articles: 1. *Bez szumu nie ma rozumu?* , 2. *Drogi Watsonie, dlaczego ten izolator*

nadprzewodzi?, 3. *O co naprawdę oskarżono Galileusza?* written to order for Agora SA and published on <http://jaktodziala.blox.pl> .

Selected other publications and interviews:

Anna Ochab-Marcinek, *Porządek z przypadku*, Academia, magazine of the Polish Academy of Sciences, 4/11(28)

9.7.2011 **Radio interview** [Polish]: *Dlaczego sklonowany kot wygląda inaczej niż oryginał?* (*Why does a cloned cat look different from the original?*) Wieczór Odkrywców, Polish Radio I

2.3.2011 **Radio interview** [Polish]: *Dlaczego sklonowany kot jest inny od oryginału?* (*Why does a cloned cat is different from the original?*) Radiowa Akademia Nauk, Radio TOK FM

2006 - 2014: Popular science blog, debunking pseudo-science: *Będąc młodym fizykiem* (*Being a young physicist*) <http://mlodyfizyk.blox.pl> . **10000 visits/month**

Education

08 Oct 2018	Habilitation in chemistry, Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, Poland
28 Sep 2006	Doctor of Philosophy in physics with honors
Ph.D. thesis:	"Spatio-temporal effect of noises on nonlinear dynamical systems" (Supervisor: prof. Ewa Gudowska-Nowak)
2002-2006	Ph.D. study M. Smoluchowski Institute of Physics, Jagiellonian University, Kraków, Poland
2002	Master of Science in theoretical physics with honors
M.Sc. thesis:	"Stochastic models of population growth and control" (Supervisor: prof. Ewa Gudowska-Nowak)
1997-2002	M.Sc. study in physics M. Smoluchowski Institute of Physics, Jagiellonian University, Kraków, Poland Specialization: theoretical physics

Programming and software

- C, C++
 - Fortran 77, 95
 - html, php, javascript
 - Unix/Linux shell scripting
 - R, Python (basic level)
 - Symbolic algebra packages: Maple, Mathematica
 - Scientific graphing and data analysis software: Origin, Gnuplot, Grace
 - Computer graphics software: Adobe Photoshop, Corel, Gimp etc.
 - LaTeX
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Teaching

- Numerical methods
 - Introductory theory of informatics
 - Self-organization in physics, chemistry and biology
 - C++ programming
 - Symbolic algebra (Maple)
 - Introductory physics
 - Introductory mathematics
 - Wave physics
 - Physics laboratory
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Languages

- Polish (native)
 - English (Cambridge Certificate in Advanced English)
 - German
 - Russian
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