

Katarzyna Starowicz- CV

Date and place of birth: September 12, 1976, Kraków, Poland

Nationality: Polish

Email: starow@if-pan.krakow.pl; starowicz@yahoo.com

ACADEMIC AND RESEARCH CAREER

Professional title: Master of Biotechnology

Major: Molecular Biology

Master Thesis entitled "Studies on the rapidly sedimenting fraction of the endoplasmic reticulum" Department of Biology and Earth Sciences, Jagiellonian University, Kraków, Poland. Experimental procedures conducted in the Department of Microbiology and Medical Biochemistry, Biomedical Centre, Uppsala University, Uppsala, Sweden

Effective date: 10.05.2000, Krakow, Poland

Scientific degree: PhD in Medical Sciences

PhD Thesis entitled: "Evidence for the involvement of MC4 receptors in the central mechanisms of opioid antinociception" Department of Medical Pharmacology and Anesthesiology, Rudolf Magnus Institute for Neuroscience, Utrecht University, Utrecht, Netherlands (international PhD program run together with the Utrecht University: programm based on an agreement between the Polish Network for Cell and Molecular Biology UNESCO/PAS and the Utrecht University)

Promotors: Prof. W.H. Gispen and Prof. R. Przewlocki

Effective date: 04.04.2005, Utrecht, the Netherlands

According to the law act dated 14.03.2003 on Academic Degrees and Title and Degrees and Title in the Field of Art, Ch. 2 art.24.1 degree awarded by the University of Utrecht is equivalent to the Academic degree referred in the Act.

Scientific degree: Associate Professor

Habilitation Thesis entitled: "The role of vanilloid receptor TRPV1 and cannabinoid CB₁ receptors and their endogenous ligands in nociceptive pathways and pain." The scientific achievement consisted of a series of 8 papers published in the years 2007 to 2013, with a total *impact factor* equal to 42.212 (242 points according to Ministry of science and Higher Education).

Committee: prof. S.Czuczwar

Reviewers: dr hab R.Stefański, dr hab. Magdalena Bujalska- Zadrożny, prof. J. Wordliczek Committee members: prof. P. Wlaż, prof. J. Dobrogowski

Secretary: dr hab. Rafał Olszanecki

Effective date: 19.09.2013, Jagiellonian University Medical College Kraków, Poland

POSITIONS HELD

- Jul 1999 - Jan 2000** Undergraduate student at the Department of Microbiology and Medical Biochemistry, Biomedical centre, Uppsala University, Sweden
- Nov 2000 - Jan 2005** PhD student at Dept. of Molecular Neuropharmacology, Polish Academy of Sciences, Cracow, Poland
- Feb 2005 - Jul 2007** Post Doctoral Researcher at Endocannabinoid Research Group, CNR, Pozzuoli (NA), Italy
- Oct 2007 - Oct 2013** Assistant Researcher, Dept. of Pharmacology of Pain, Institute of Pharmacology Polish Academy of Sciences, Cracow, Poland
- Oct 2013 - present** Associate Professor; Chair of Laboratory of Pain Pathophysiology, Dept. of Pharmacology of Pain, Institute of Pharmacology Polish Academy of Sciences, Cracow, Poland

RESEARCH FELLOWSHIPS

- 2001** Rudolf Magnus Institute for Neuroscience, Department of Medical Pharmacology and Anesthesiology, Utrecht University Holandia, prof. Roger Adan and prof. Willem Hendrik Gispen

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- 2004** Klinik für Anaesthesiologie und operative Intensivmedizin, Charite-Universitätsmedizin Berlin, Campus Benjamin Franklin, Germany, fellowship within the scholarship Polish Network of Molecular and Cell Biology UNESCO/PAN, prof. Christoph Stein
- 2005** Rudolf Magnus Institute for Neuroscience, Department of Medical Pharmacology and Anesthesiology, Utrecht University, The Netherlands, prof. Roger Adan and prof. Willem Hendrik Gispen
- 2005-2007** Endocannabinoid Research Group, Istituto di Chimica Biomolecolare, Consiglio Nazionale delle Ricerche, Pozzuoli, Italy, prof. Vincenzo Di Marzo

PROFESSIONAL SKILLS

Behavioural:

- Tests for measurement of nociceptive threshold (thermal and mechanical nociceptive stimuli) in rodents
- Tests for measurement of nociception processes in chronic pain e.g. inflammatory, neuropathic and osteoarthritis pain models; plethysmometry; joint hypersensitivity (pressure application measurements); dynamic weight bearing; animal models of drug tolerance and dependence
- Surgery to the rat sciatic nerve- chronic constriction injury (Bennett model)
- Induction of chemical osteoarthritis model (intra articular injection of iodoacetate)

Biochemical:

- Measurement of gene expression and transcription regulation (mRNA extraction and purification, reverse transcription - real-time polymerase chain reaction, qRT-PCR)
- Quantitative and qualitative protein measurements (protein extraction and purification, Western blot,; animals transcardiac perfusion, vibratome and cryostat sectioning, immunohistochemistry and immunofluorescence)
- Confocal microscope and computer image analysis

OTHERS

Reviewing projects and publications:

- **Reviewer** of scientific papers sent to the journal Current Topics in Pharmacology, Pharmacology & Therapeutics, Neuroscience Letters, Eur J Pharmacol, Pharmacological Reports, Pharmacological Research.
- **Grant reviewer** for the National Institute of Academic Anaesthesia (NIAAA) and for The Hungarian Scientific Research Fund (OTKA), National Science Centre (NCN), Poland

British Journal of Pharmacology (BJP) Editorial Board Member

Guest Editor Special Issue on Chronic Pain: New Insights in Molecular and Cellular Mechanisms, BioMed Research International (formerly titled Journal of Biomedicine and Biotechnology) is a peer-reviewed, open access journal that publishes original research articles as well as review articles in several areas of life sciences.

Board of directors at Intelliseq

MANAGEMENT OF INTERNATIONAL AND NATIONAL RESEARCH PROJECT

Project: N N401 015235

Nature of participation in the project: **Principal Investigator**

Defining the role of spinal vanilloid receptors and their endogenous ligands in pharmacology and treatment of neuropathic pain

Source of funding: Ministry of Science and Higher Education, Warsaw, Poland amount allocated: 400.000 PLN

Grant Program HOMING FNP

Nature of participation in the project: **Principal Investigator**

The role of spinal TRPV1 vanilloid receptors in the analgesic effects of anandamide in a model of neuropathic pain.

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Source of funding: Foundation for Polish Science amount allocated: 120.000 PLN

Grant Program LIDER/29/60/L-2/10/NCBiR/2011

Nature of participation in the project: **Principal Investigator**

The interaction between endocannabinoids and endovanilloids as a new therapeutic target in neuropathic pain.

Source of funding: National Centre for Research and Development (NCBiR) amount allocated: 989.000 PLN

SONATA BIS no. UMO-2012/07/E/NZ7/01269- ongoing project (2013-2016)

Nature of participation in the project: **Principal Investigator**

Investigation for pharmacotherapy of osteoarthritis (OA): TRPV1 and CB1 receptors and their endogenous ligands as new targets for pharmacological intervention.

Source of funding: National Science Centre, Kraków, Poland, amount allocated: 1.497.000 PLN

OPUS no. UMO-2014/13/B/NZ7/02311 - ongoing project (2015-2018)

Nature of participation in the project: **Principal Investigator**

Targeting peripheral cannabinoid receptors CB2 as a novel therapy to treat osteoarthritis

Source of funding: National Science Centre, Kraków, Poland, amount allocated: 1.553.250 PLN

PARTICIPATION IN RESEARCH PROJECTS

- **Project: N N401 061735**
The role of astrocytes in opioid signaling in the central nervous system in vitro and in vivo
- **Project „DEPRESSION - MECHANISMS – THERAPY” 2010-2014**
Role of glia in effectiveness of antidepressants drugs applied in neuropathic pain - new possibility of therapy
- **Project: N N405 375937**
Modulation of microglia activation in neuropathic pain - new experimental approach in the pain therapy
- **Project PBZ-MN-001-/P05/2002**
Peripheral antinociceptive action of endomorphins in inflammatory and neuropathic pain- mechanisms and clinical application
- **Project QLRT-2001-02929**
Opioids treatment of chronic pain and inflammation in the locomotor system
- **Project I/78562**
The role of endocannabinoids in extinction of aversive memories in mice
- **Project ICB/767/06**
Elevation of FAA levels and activation of CB/TRPV/prostamide receptors as a new therapeutic strategy

INTERNATIONAL AND NATIONAL AWARDS FOR SCIENTIFIC ACHIEVEMENTS

- Jul 1999 - Jan 2000** Internship under the ERASMUS/SOCRATES exchange program, undergraduate student at the Department of Microbiology and Medical Biochemistry, Biomedical centre, Uppsala University. Project under Prof Erik Fries supervision; Uppsala, Sweden,
- Nov 2000** 4-year scholarship to complete doctoral thesis, Utrecht University PhD Programme based on an agreement between the Polish Network for Cell and Molecular Biology UNESCO/PAS and the Utrecht University (for details see: <http://dna.iimcb.gov.pl/iimcb/default.php?func=phdprogram>); Utrecht, Netherlands,
- Apr 2003** FENS/IBRO summer school “Peripheral Nervous System: from biology to disease”, top 10 applicants awarded; Ofir, Portugal,
- May 2003** 6th international Polish Neuroscience Society award for young investigator and invited speaker for the session “Neurobiology of pain”; Warsaw, Poland,
- May 2003** L’OREAL financial support for young scientists (top 3) at the European Neurochemistry Society Meeting; Warsaw, Poland,
- Apr 2004** European Opioid Conference financial stipend to cover travel and accommodation costs; Vysehrad, Hungary,

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- Jun 2004** Polish Network of Molecular and Cell Biology UNESCO/PAN stipend for a short term research visit at Prof. Ch. Stein laboratory; Berlin, Germany,
- Mar 2005** Foundation for Polish Science (FNP) for young scientists, START award for present scientific achievements (102 awards in all disciplines for 761 applications received, see also: http://www.fnp.org.pl/programy_aktualne/stypendia_krajowe_laureaci2005.html); Warsaw, Poland,
- Jun 2006** ICRS Scientific Achievement Award on 16th International Cannabinoid Research Society Symposium (8 pre-doctoral and 4 post-doctoral awards among 110 participants); Tihany, Hungary,
- Jun 2007** ICRS achievement award for outstanding scientific presentation; Montreal, Canada,
- Jul 2007** "Neurotrain - Neuroscience Training in Europe" stipend (funded by UE); Vienna, Austria,
- Sep 2007** Best poster presentation award at the 8th International Congress of The Polish Neuroscience Society; Krakow, Poland,
- Sep 2007** HOMING Programme award recipient - reintegration grant for researchers after their stay abroad and fostering cooperation with their former host institutions, see also: http://www.fnp.org.pl/programy_aktualne/laureaci_powroty_2007.html); Warsaw, Poland,
- Oct 2009** Best poster presentation award at the 4th International Congress of The Polish Pain Society; Zakopane, Poland,
- Feb 2010** Award for best review published in quarterly journal "Bol" of Polish Branch of IASP Chapter; Krakow, Poland,
- May 2011** Gordon Research Conference Scientific Award; Les Diablerets, Switzerland,
- Apr 2011** Prestige stipend LIDER funded by National Research and Development Center; Warsaw, Poland,
- Jul 2012** Best oral presentation award at the 22nd International Cannabinoid Research Society Symposium; Freiburg, Germany,
- Nov 2012** Postdoctoral scholarship in 12th edition of the L'Oreal Poland for Women and Science; Warsaw, Poland,
- Nov 2012** The invitation to present a lecture at 30th Winter School of the Institute of Pharmacology PAS In Krakow, "Chronic pain, mechanisms, therapy".
- Jun 2013** The invitation to present a lecture at 10th European Pain School, summer school under the patronage of IASP and FENS/IBRO for doctoral students and young post-docks, held in Siena (Italy)

Additionally I was a recipient of conference travel awards partially funding my participation at scientific meetings:

- Apr 2003** International Narcotic Research Conference (INRC) young scientist award; Perpignan, France,
- Apr 2005** International Association for the Study of Pain (IASP) support for young scientists to participate at 11th World Congress on Pain; Sydney, Australia,
- Mar 2006** International Cannabinoid Research Society (ICRS) support for young scientists to participate at 16th International Cannabinoid Research Society Symposium; Tihany, Hungary,
- Mar 2007** International Cannabinoid Research Society (ICRS) travel award; Montreal, Canada, European Opioid Conference stipend to cover travel and accommodation; Ferrara, Italy, March 2008
- May 2009** International Cannabinoid Research Society (ICRS) travel award for 19th International Cannabinoid Research Society Symposium; Chicago, USA,
- May 2009** EFIC stipend to cover travel to European federation of IASP Chapters; Lisbon, Portugal,
- Aug 2010** International Association for the Study of Pain support for young scientists to participate at World Congress on Pain; Montreal, Canada,
- Jul 2010** International Cannabinoid Research Society (ICRS) travel award for 20th International Meeting of Cannabinoid Research Society; Lund, Sweden,
- May 2011** Gordon Research Conference Travel Award; Les Diablerets, Switzerland.

INVITED SPEAKER AT INTERNATIONAL AND NATIONAL SCIENTIFIC MEETINGS

- 2002** Melanocortin and CRF receptor antagonists reverse morphine tolerance in rats. 22-25. 05.2002: 12th Annual Meeting of the European Neuropeptide Club, Olsztyn, Poland
- 2003** The role of melanocortins and their receptors in nociception. 6th international congress of the Polish Neuroscience Society, Warszawa, Poland

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- 2004** Pain modulation by melanocortin-opioid interactions. 5th International Congress of Polish Association for the Study of Pain, Wrocław, Poland
Melanocortins in chronic pain. 50 years anniversary of the Institute of Pharmacology, Polish Academy of Sciences in Cracow, Kraków, Poland
- 2007** Tonic endovanilloids facilitation of glutamate release in brainstem descending antinociceptive pathways. 17th Annual Symposium on the Cannabinoids, International Cannabinoid Research Society, St-Sauveur, (Québec), Canada
Endovanilloids form a network with opioids in PAG-RVM descending pain pathways. 8th International Narcotic Research Conference, Berlin, Germany
Endocannabinoid/endovanilloid affect descending nociceptive pathway via both CB₁ and TRPV1 receptors and form networks with opioids in the PAG-RVM circuit. 6th International Congress of Polish Association for the Study of Pain, Kraków, Poland
- 2009** Anandamide-induced analgesia through a spinal TRPV1-dependent mechanism in neuropathic rats. 19th Annual Symposium of the International Cannabinoid Research Society, St. Charles/Chicago, USA
- 2010** Anandamide - a dual player at spinal CB₁ cannabinoid and vanilloid TRPV1 receptors. European Neuropeptide Club, Pecs, Hungary
Inhibitors of fatty-acid amide hydrolase suppress neuropathic pain symptoms through spinal endocannabinoid/endovanilloid mechanisms - role of lipoxygenases. Centre for Neuroscience, University of Dundee, *Great Britain*
- 2011** Anandamide attenuates neuropathic pain symptoms by spinal TRPV1 and CB1 receptor activation, 13th Conference of Hungarian Neuroscience Society, Budapest, Hungary
Response of spinal TRPV1 and CB₁ receptors in a rat model of neuropathic pain depends on anandamide concentration, European Winter Conference on Brain Research (EWCBR), Les 2 Alpes, France
- 2012** Regulation of TRPV1 responsiveness to anandamide and other endovanilloid in neuropathic pain. European Winter Conference On Brain Research (EWCBR), Villars Sur Ollon, Switzerland
OMDM198, a compound targeting both TRPV1 and fatty acid amide hydrolase: a new pain management strategy in osteoarthritis? 22nd Annual Symposium on the Cannabinoids, International Cannabinoid Research Society, Freiburg, Germany
- 2013** Role of vanilloid TRPV1 and cannabinoids CB1 receptors and their endogenous ligands in pain processes. 30th Winter School of the Institute of Pharmacology PAS In Krakow, "Chronic pain, mechanisms, therapy"
- 2014** New insights into endocannabinoid-based therapeutic drugs for chronic. Winter Conference on Brain Research (EWCBR), Brides-les-Bains, France
- 2014** Endocannabinoids in the treatment of chronic pain. Scientific Association of Biotechnology Students "Mygen", Kraków, Poland
- 2014** Single agent or multiple targets for a successful drug intervention to control pain. Pharmacology 2014 "Promises and limitations of novel pharmacological targets in pain research", London, UK
- 2015** The endocannabinoid system and osteoarthritis: therapeutic implication. Advances in pain research: pathophysiology and new therapeutic strategies, Naples, Italy
- 2015** Role of endocannabinoid system in the pathogenesis of osteoarthritic pain, NIDA symposium at the 25th Annual International Cannabinoid Research Society Symposium on the Cannabinoids, Wolfville, Nova Scotia, Canada

MEMBER OF

- European Neuropeptide Club (ENC, since 2002)
- European Opioid Club (EOC, since 2002)
- Polish Chapter of IASP (PTBB, Since 2004)
- International Cannabinoid Research Society (ICRS, since 2005)
- Society for Neuroscience (SFN, since 2007)
- International Association for the Study of Pain (IASP, since 2010)
- Special Interest Group on Neuropathic Pain (NeuPSIG, since 2010)
- British Pharmacological Society (BPS, since 2013)

TEACHING AND POPULARIZATION

Internship training supervisor of undergraduate students:

- 2001** Ewa Bieniek (College of Medicine, Vermont University)
2009 Anna Górlaczyk
2010 Piotr Kardas, Magdalena Serafin, Tomasz Uchanski (Faculty of Biochemistry, Biophysics and Biotechnology, Jagiellonian University, Krakow), Monika Mrugała (Agricultural University, Krakow)
2011 Natalia Kolosowska (Faculty of Biotechnology, Wrocław)
2012 Monika Mrugała's M.Sc. Thesis supervisor
2013-2016 Natalia Malek's PhD Thesis supervisor
2014-2015 Jakub Mlost's Undergraduate Thesis supervisor
2015 Adrian Kobiela (University College, London), summer practice

Others:

- 2013 and 2015** Lecturer at PAIN MEDICINE Postgraduate Studies conducted at the Center for Teaching and Congress of the Medical Faculty, Jagiellonian University

CONFERENCE/ WORKSHOP SCIENTIFIC AND/OR ORGANIZING COMMITTEE MEMBER

- Sep-Oct 2002** „Jagiellonian University Workshop on Basic and Clinical Aspects of Neuroscience", invited speakers: M. Di Luca, Milan, Itali; W.H. Gispen, Utrecht, the Netherlands; P.R. Bar, Utrecht, the Netherlands
- Oct 2010** Organizing Committee Member of European Molecular Biology Organisation (EMBO) Symposium, chairs: Ryszard Przewlocki, Ivan Dikic
- Apr 2011** Scientific Committee Member of European Opioid Conference (EOC)
- Apr 2011** Chair of the Organizing Committee of European Opioid Conference (EOC)
- Sep 2011** Chair of „Endovanilloids for pain control and beyond" Symposium, Polish Neuroscience Society (PTBUN)
- Mar 2012** Chair of „The role of TRPV1 and other TRPs in pain and nociception" Symposium, 32nd European Winter Conference on Brain Research (EWCBR)
- Jul 2012** "Pain" Session chairman at the 22nd Annual Symposium of the International Cannabinoid Research Society (ICRS)
- Feb 2013** Organizing Committee Member of Institute's of Pharmacology Winter School
- May 2013** Scientific and Organizing Committee Member of NEURONUS IBRO&IRUN Neuroscience Forum
- May 2013** "Neurodegeneration" Session chairman at NEURONUS IBRO&IRUN Neuroscience Forum
- July 2013** "Immunology & Autoimmune Disorders" Session chairman at the 23rd Annual Symposium of the International Cannabinoid Research Society (ICRS)
- Feb 2015** Chair of the Scientific and Organizing Committee of Institute's of Pharmacology Winter School
- April 2015** ICRS Scientific Programm Committee
- July 2015** Member of EFIC Pain School Scientific and Organizing Committee
- Jun 2016** Appointed Chair of the Organizing Committee of the 26th Annual Symposium of the International Cannabinoid Research Society (ICRS)

POPULARISATION OF SCIENTIFIC ACHIEVEMENTS (mostly in polish)

- 2009** <http://www.dziennikpolski24.pl/artykul/2571724,byc-naukowcem-byc-naukowcem,id,t.html?cookie=1>
- 2011** <http://biotechnologia.pl/biotechnologia/aktualnosci/biotechnolog-wsrod-laureatow-konkursu-lider-wywiad-z-dr-katarzyna-starowicz-bubak,10032>
- 2012** <https://www.youtube.com/watch?v=dbrigN4PjEg>
<https://www.youtube.com/watch?v=siKMbu2tSYQ&list=PLy7ph4PoWQhuexZpKK7PytHB6AYk9e-9p>

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- 2013** <http://biotechnologia.pl/biotechnologia/aktualnosci/o-kobietach-w-polskiej-nauce-i-nie-tylko-rozmowa-z-dr-katarzyna-starowicz-bubak,12459>
- 2014** <http://www.warsawvoice.pl/WVpage/pages/article.php/27604/article>
<http://naukawpolsce.pap.pl/aktualnosci/news,401232,nowy-cel-w-terapii-bolu.html>
<http://innpoland.pl/114293,lider-czyli-milion-zlotych-dla-mlodych-naukowcow-zespol-dr-hab-starowicz-bubak-dokona-rewolucji-w-leczeniu-bolu>
- 2015** <http://naukawpolsce.pap.pl/aktualnosci/news,404847,polscy-badacze-maja-pomysl-jak-przechytrzyć-bol-stawow.html>