

Petra Popovics, Ph.D.

K12 Scholar/Assistant Scientist
University of Wisconsin
Department of Urology
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Education

- 07/2013 **Ph.D. in Biomedical Sciences/Molecular Biology**
University of St. Andrews, School of Medicine, St. Andrews, UK
Dissertation: "Biochemical and functional characterisation of Phospholipase C- η 2"
- 06/2009 **B.S./M.S. in Biological Sciences** (summa cum laude)
University of Pecs, Faculty of Sciences, Institute of Biology, Pecs, Hungary

Research experience

- Since 2019
June **University of Wisconsin-Madison, School of Veterinary Medicine and the Department of Urology, School of Medicine and Public Health**
K12 Scholar/Assistant Scientist
Mentors: Willam A. Ricke and Chad M. Vezina
Project goal: Characterize the role of osteopontin in prostatic inflammation and fibrosis
- 2018 Nov.-
2019 May **Case Western Reserve University, School of Medicine, Department of Urology**
Research Associate
Mentor: Magdalena M. Grabowska, Ph.D.
♦ Identified osteopontin-stimulated inflammatory signals in the prostate
♦ Examined the expression of NFIB transcription factor in benign prostate cells
- 2013 – 2018: **University of Miami, Miller School of Medicine/Miami VA Medical Center**
Division of Endocrinology, Metabolism and Diabetes/
Endocrine, Polypeptide and Cancer Institute
Postdoctoral Researcher/Sr. Research Associate II
Mentor: Andrew V. Schally PhD, MDhc (Multi), D.Sc. h.c.
♦ Generated animal models of chronic prostatic inflammation to study the effects of growth hormone-releasing hormone (GHRH) antagonists in inflammation-induced prostatic hypertrophy
♦ Examined the signaling mechanism of GHRH and its interaction with growth hormone pathways using primary cells and 3D/co-culture strategies

- ◆ Defined the pathological and molecular mechanism of GHRH analogs in various cancer (prostate, breast cancer, glioblastoma, leukemia, melanoma) and disease models (diabetes, myocardial infarction etc.)
- ◆ Defined the hormonal activity of GHRH analogs *in vitro* and *in vivo*

2012 Dec. –
– 2013 Jan. **Universitätsklinikum Carl Gustav Carus an der Technischen Universität Dresden, Medizinische Klinik und Poliklinik III, Dresden, Germany**
Research Fellow

- ◆ Training: isolation and culturing of pancreatic islets from rats

2009 – 2013 **University of St. Andrews, School of Medicine, St. Andrews, UK**
Graduate Student

Ph.D. Advisor: Alan J. Stewart, Ph.D.

- ◆ Investigated the effects of point-mutations at calcium- and membrane-binding sites of phospholipase C- η 2 (PLC η 2) on enzymatic activity
- ◆ Defined the role of PLC- η 2 in neuronal signaling and neurite outgrowth

2005 – 2009 **University of Pecs, School of Medicine, Pecs, Hungary**

Undergraduate Research Student

Advisor: Magdolna Kovacs, M.D., Ph.D.

- ◆ Investigated the hormonal regulation of the hypophyseal inhibin-activin-follistatin system

Teaching experience

2008-2009 **University of Pecs, School of Medicine, Pecs, Hungary**

- ◆ Human histology - instructor
- ◆ Human anatomy - instructor

2012 **University of St. Andrews, School of Medicine, St. Andrews, UK**

- ◆ Basic biochemistry laboratory - instructor

Mentoring experience

2015 **University of Miami, Miller School of Medicine/Miami VA Medical Center**

- ◆ Patricia Sanmartín-Salinas, graduate student
Preclinical testing of GHRH analogs in benign and malignant disease models

2009-2012 **University of St. Andrews, School of Medicine, St. Andrews, UK**

- ◆ Mohammed Arastoo, graduate student
The role of PLC η 2 in neuronal signaling and Alzheimer`s disease
- ◆ William E. Beswick, medical student
The roles of the PH and C2 domains in PLC η 2 function
- ◆ L. Nadia Kamil, medical student
The role of the EF-loop in directing Ca²⁺-sensitivity in PLC η 2
- ◆ Audrey J. L. Tan, medical student
The role of phospholipase C- η 2 in retinoic acid-stimulated neurite growth

Honors and awards

2019	Travel award to attend the 2019 Basic Sciences Symposium at the AUA Annual Meeting
2018	Urology Scientist Mentoring and Research Training (USMART) Academy
2017	Urology Care Foundation Outstanding Graduate Scholar Award
2016	Travel award of the Society for Basic Urologic Research
2015	Urology Care Research Scholar Award for 2015-2017
2012	Shortlisted for the Principal's medal, University of St. Andrews, UK
2012	British Society for Cell Biology Travel Award
2011	Selected participant for "A Course in Molecular Neuroanatomy" at the Okinawa Institute of Science and Technology (Japan) organized by the Allen Brain Institute, Seattle, WA
2010	Kozinn-Maddonick Travel Award (UK)

Professional development and service

Memberships in professional and scientific societies

2017-	Society of Women in Urology
2016-	Society for Basic Urologic Research
2016-	American Urological Association
2013-2014	Hungarian Medical Association of America
2010-2012	Biochemical Society
2009-2012	British Society for Cell Biology

Postdoctoral training

2017	Early Career Investigators Workshop- American Urological Association Headquarters
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Conference

2019	Poster Session Moderator, AUA Annual Meeting
2018	Member, Trainee Affairs Committee, Fall Meeting of the Society for Basic Urologic Research

Invited talks

- ◆ Molecular links between chronic inflammation and benign prostatic hyperplasia. Beth Israel Deaconess Medical Center, Boston, MA, 2019.

- ◆ Molecular links between chronic inflammation and benign prostatic hyperplasia. U54 George M. O'Brien Center for Benign Urology Research, Wisconsin, Madison, WI, 2018.
- ◆ Chronic inflammation and epithelial-to-mesenchymal transition in benign prostatic hyperplasia. University of Illinois at Chicago, Department of Pathology, Chicago, IL, 2017.
- ◆ Growth Hormone-Releasing Hormone (GHRH) Antagonists Inhibit Inflammation-induced Prostate Enlargement In Mice And Reduce The Proliferation Of Prostate Epithelial Cells In Vitro. Society for Basic Urologic Research Fall Symposium, Scottsdale, AZ, 2016.
- ◆ Growth hormone-releasing hormone antagonists decrease inflammation and TGFβ2-induced proliferation of human BPH-1 cells - a novel link between prostatic inflammation and autocrine/paracrine GHRH. 80th Annual Meeting of the Southeastern Section of the American Urological Association, Nashville, TN, 2016.
- ◆ Targeted therapy of glioblastoma multiforme with growth hormone-releasing hormone (GHRH) analogs. 46th Annual Scientific Meeting of the Hungarian Medical Association Of America, Sarasota, FL, 2014.
- ◆ A single EF-loop directs calcium sensitivity in phospholipase C-η2. Signalling 2011: A Biochemical Society Centenary Celebration, Edinburgh, UK, 2011
- ◆ Phospholipase C-η2 is activated by elevated intracellular Ca²⁺ levels and requires both the PH and C2 domains for activity. 11th Meeting of the European Calcium Society, Warsaw, Poland, 2010.

Peer-reviewed publications

Total citations: 365 (determined by Google Scholar, March 26, 2019)

1. Schally AV, Wang H, He J, Cai R, Sha W, **Popovics P**, Perez R, Vidaurre I and Zhang X. Agonists of Growth Hormone-Releasing Hormone (GHRH) Inhibit Human Experimental Cancers in vivo by Downregulating Receptors for GHRH. *Proceedings of the National Academy of Sciences of the United States of America*. 2018; 115: 12028-12033.
2. **Popovics P**, Cai R, Sha W, Rick FG and Schally AV. Growth hormone-releasing hormone antagonists reduce prostatic enlargement and inflammation in carrageenan-induced chronic prostatitis. *Prostate*. 2018; 78: 970-980.
3. Jimenez JJ, DelCanto GM, **Popovics P**, Perez A , Granda AV, Vidaurre I, Cai RZ, Rick FG, Swords RT and Schally AV. A new approach to the treatment of acute myeloid leukemia. *British Journal of Haematology*. 2018; 181: 476-485.
4. Zarandi M, Cai R, Kovacs M, **Popovics P**, Szalontay L, Cui T, Sha W, Jaszberenyi M, Varga J, Zhang X, Block NL, Rick FG, Halmos G and Schally AV. Synthesis and structure-activity studies on novel analogs of human growth hormone releasing hormone

(GHRH) with enhanced inhibitory activities on tumor growth. *Peptides*. 2017; 24(89): 60-70.

5. **Popovics P**, Schally AV, Salgueiro L, Kovacs K and Rick FG. Antagonists of growth hormone-releasing hormone (GHRH) inhibit proliferation induced by inflammation in prostatic epithelial cells. *Proceedings of the National Academy of Sciences of the United States of America*. 2017; 114(6):1359-1364.
6. Arastoo M, Hacker C, **Popovics P**, Lucocq JM and Stewart AJ. Phospholipase C- η 2 interacts with nuclear and cytoplasmic LIMK-1 during retinoic acid-stimulated neurite growth. *Histochemistry and Cell Biology*. 2016; 145(2): 163-173.
7. Zhang X, Cui T, He J, Wang H, Cai RZ, **Popovics P**, Vidaurre I, Sha W, Schmid J, Ludwig B, Block NL, Bornstein SR and Schally AV. Beneficial effects of growth hormone-releasing hormone agonists on rat INS-1 cells and on streptozotocin-induced NOD/SCID mice. *Proceedings of the National Academy of Sciences of the United States of America*. 2015; 112: 13651–13656.
8. Kanashiro-Takeuchi RM, Szalontay L, Schally AV, Takeuchi LM, **Popovics P**, Jaszberenyi M, Vidaurre I, Zarandi M, Cai RZ, Block NL, Hare JM and Rick FG. New therapeutic approach to heart failure due to myocardial infarction based on targeting growth hormone-releasing hormone receptor. *Oncotarget*. 2015; 6:9728-9739.
9. **Popovics P**, Frigo DE, Schally AV and Rick FG. Targeting the 5'-AMP-activated protein kinase and related metabolic pathways for the treatment of prostate cancer. *Expert Opinion on Therapeutic Targets*. 2015; 20:1-16.
10. Perez R, Schally AV, **Popovics P**, Cai R, Sha W, Rincon R, Rick FG. Antagonistic analogs of growth hormone-releasing hormone increase the efficacy of treatment of triple negative breast cancer in nude mice with doxorubicin; A preclinical study. *Oncoscience*. 2014; 1(10): 665-673.
11. **Popovics P**, Schally AV, Block NL, Rick FG: Preclinical therapy of benign prostatic hyperplasia with neuropeptide hormone antagonists. *World Journal of Clinical Urology*. 2014; 3(3):184-194.
12. **Popovics P**, Schally AV, Szalontay L, Block NL and Rick FG. Targeted cytotoxic analog of luteinizing hormone-releasing hormone (LHRH), AEZS-108 (AN-152), inhibits the growth of DU-145 human castration-resistant prostate cancer in vivo and in vitro through elevating p21 and ROS levels. *Oncotarget*. 2014; 5(12):4567-4578.
13. Szalontay L, Schally AV, **Popovics P**, Vidauerre I, Krishan A, Zarandi M, Cai RZ, Klukovits A, Block NL, Rick FG. Novel GHRH antagonists suppress the growth of human malignant melanoma by restoring nuclear p27 function. *Cell Cycle*. 2014; 13(17): 2790-2797.
14. Jaszberenyi M, Rick FG, **Popovics P**, Block NL, Zarandi M, Cai RZ, Vidaurre I, Szalontay L, Jayakumar AR and Schally AV. Potentiation of cytotoxic chemotherapy by

growth hormone-releasing hormone agonists. *Proceedings of the National Academy of Sciences of the United States of America*. 2014; 111(2):781-786.

15. Cai R, Schally AV, Cui T, Szalontay L, Halmos G, Sha W, Kovacs M, Jaszberenyi M, He J, Rick FG, **Popovics P**, Kanashiro-Takeuchi R, Hare JM, Block NL and Zarandi M. Synthesis of new potent agonistic analogs of growth hormone-releasing hormone (GHRH) and evaluation of their endocrine and cardiac activities. *Peptides*. 2014; 52:104-112.
16. **Popovics P**, Lu J, Nadia Kamil L, Morgan K, Millar RP, Schmid R, Blindauer CA and Stewart AJ. A canonical EF-loop directs Ca²⁺ -sensitivity in phospholipase C- η 2. *Journal of Cellular Biochemistry*. 2014; 115(3):557-565.
17. Kanczkowski W, Alexaki VI, Tran N, Grossklaus S, Zacharowski K, Martinez A, **Popovics P**, Block NL, Chavakis T, Schally AV and Bornstein SR. Hypothalamo-pituitary and immune-dependent adrenal regulation during systemic inflammation. *Proceedings of the National Academy of Sciences of the United States of America*. 2013; 110(36):14801-14806.
18. **Popovics P**, Gray A, Arastoo M, Finelli DK, Tan AJ and Stewart AJ. Phospholipase C- η 2 is required for retinoic acid-stimulated neurite growth. *Journal of Neurochemistry*. 2013; 124(5):632-644.
19. **Popovics P** and Stewart AJ. Phospholipase C- η activity may contribute to Alzheimer's disease-associated calciumopathy. *Journal of Alzheimer's disease*. 2012; 30(4):737-744.
20. **Popovics P** and Stewart AJ. Putative roles for phospholipase C η enzymes in neuronal Ca²⁺ signal modulation. *Biochemical Society Transactions*. 2012; 40(1):282-286.
21. **Popovics P**, Beswick W, Guild SB, Cramb G, Morgan K, Millar RP and Stewart AJ. Phospholipase C- η 2 is activated by elevated intracellular Ca²⁺ levels. *Cellular Signalling*. 2011; 23(11):1777-1784.
22. **Popovics P**, Rekasi Z, Stewart AJ and Kovacs M. Regulation of pituitary inhibin/activin subunits and follistatin gene expression by GnRH in female rats. *The Journal of Endocrinology*. 2011; 210(1):71-79.
23. **Popovics P** and Stewart AJ. GPR39: a Zn(2+)-activated G protein-coupled receptor that regulates pancreatic, gastrointestinal and neuronal functions. *Cellular and Molecular Life Sciences*. 2011; 68(1):85-95.

SELECTED CONFERENCE PRESENTATIONS

1. **Popovics P**, Schally AV, Salgueiro, Kovacs K, Rick FG. Inflammation-induced prostatic enlargement and proliferation of prostate epithelial cells is reduced by growth hormone-releasing hormone (GHRH) antagonists through the inhibition of epithelial-to-mesenchymal transition. American Urological Association Annual Meeting, May 12-16, 2017, Boston, MA. Abstract No. MP17-03. *J Urology* ; 197(4) , e212. Poster presentation and a 3-minute oral communication.

2. **Popovics P**, Schally AV, Salgueiro L, Cai R, Rick FG. Growth Hormone-Releasing Hormone (GHRH) Antagonists Inhibit Inflammation-induced Prostate Enlargement In Mice And Reduce The Proliferation Of Prostate Epithelial Cells In Vitro. Society for Basic Urologic Research Fall Symposium 2016, November 10-13, Scottsdale, AZ. Poster presentation and selected for oral communication.
3. **Popovics P**, Schally AV, Perez R, Cai R, Rick FG. Growth hormone-releasing hormone (GHRH) antagonists reduce inflammation- and transforming growth factor (TGF)- β 2-induced proliferation of human BPH-1 prostate epithelial cells grown in 3D culture. American Urological Association Annual Meeting, May 6-10, 2016, San Diego, CA. Abstract No. MP44-11. J Urology ; 195(4) , e602 - e603.
4. **Popovics P**, Schally AV, Perez R, Cai R, Block NL, Rick FG. Growth hormone-releasing hormone antagonists decrease inflammation and TGF β 2-induced proliferation of human BPH-1 cells - a novel link between prostatic inflammation and autocrine/paracrine GHRH. 80th Annual Meeting of the Southeastern Section of the American Urological Association, 2016, March 17-20, Nashville, TN. Abstract No.: 149. Poster presentation and invited talk.
5. **Popovics P**, Schally AV, Perez R, Cai R, Block NL, Rick FR. A new potent growth hormone-releasing hormone antagonist decreases inflammation and TGF β 2-induced proliferation of human BPH-1 cells - a novel link between prostatic inflammation and autocrine/paracrine GHRH. Society for Basic Urologic Research Fall Symposium 2015, November 12-15, Fort Lauderdale, FL. Poster presentation and selected for oral communication.
6. **Popovics P** Targeted therapy of glioblastoma multiforme with growth hormone-releasing hormone (GHRH) analogs. 46th Annual Scientific Meeting of the Hungarian Medical Association Of America, 2014, October 26-31, Sarasota, FL. Invited talk
7. **Popovics P**, Schally AV, Szalontay L, Block NL, Rick FG. Inhibition of the growth of the DU-145 human androgen-independent prostate cancer cells in vitro and in vivo by AEZS-108, a targeted cytotoxic analog of luteinizing hormone-releasing hormone (LHRH). 3rd Florida Prostate Cancer Research Symposium 2014, March 21-22, Orlando, FL. Poster presentation and a 3-minute oral communication.
8. **Popovics P**, Kamil LN and Stewart AJ. A single EF-loop directs calcium sensitivity in phospholipase C- η 2. Signalling 2011: A Biochemical Society Centenary Celebration, Edinburgh, UK, 2011 June. Poster presentation and selected for oral communication.
9. **Popovics P**, Beswick EW, Stewart AJ. Phospholipase C- η 2 is activated by elevated intracellular Ca²⁺ levels and requires both the PH and C2 domains for activity. 11th Meeting of the European Calcium Society, Warsaw, Poland, 2010 September. Acta Biochimica Polonica Vol. 57 S23. Poster presentation and selected for oral communication.
10. **Popovics P**, Kovács M, Rékási Z. Effects of local and endocrine factors on the mRNA expression of inhibin/activin subunits and follistatin in perfused pituitary cells. The 7th International Congress of Neuroendocrinology 2010, July 11-15, Rouen, France. Poster presentation.

Research support

Urology Care Foundation Research Scholar Award (07/01/15-06/30/17, no cost extension until 09/30/17)

Use of receptors for growth hormone-releasing hormone (GHRH) and luteinizing hormone-releasing hormone (LHRH) receptors as potential therapeutic targets to reduce inflammation and epithelial-to-mesenchymal transition in Benign Prostatic Hyperplasia. mentors: Andrew V. Schally, PhD and Ferenc G. Rick, MD PhD

Amount: \$40,000/year