

PhD, MSc, BSc

About

I was born in Sofia (Bulgaria) in 1982 and I moved to Finland in 2005. I am interested in computational biology and have worked in the fields of immunology and evolution.

Contact information

Phone: +358451472612

E-mail: petar.petrov@oulu.fi

ORCID: [0000-0001-5551-8032](https://orcid.org/0000-0001-5551-8032)

Page: <https://pebope.neocities.org/>

GitHub: <https://github.com/lzzilab>

GitLab: <https://gitlab.com/pebope>

Language skills

English (fluent) 

Russian (good) 

Finnish (basics) 

Bulgarian (native) 

Lab experience

I have used a variety of wet-lab methods, including cell, biochemical and molecular biology techniques.

Coding skills

I am proficient in BASH, R and have knowledge of Python. I also prepared a C++ patch for [CAPS](#), improving its output.

Open source

I am a long time Linux user and I am among the top 10 maintainers at [SBo](#) - a ports-like system for [Slackware](#) Linux.

Scientific societies

I have been a member of [SSI](#) (Scandinavian Society for immunology) since 2005.

Work experience

Post-doc (11.2022 -) **University of Oulu**, Infotech Institute. I am working closely with the group of Assoc. Prof. Valerio Izzi, faculty of Biochemistry and Molecular medicine (FBMM), on extracellular vesicles (EVs) and extracellular matrix (ECM). I participate in the following projects:

- **Extracellular matrix neoantigens: new cancer immunotherapy AutoCoEv** version 2.0 (under development)
- **MatrisomeAnalyzer** ([Petrov et al., 2023](#); [GitHub](#); [ShinyApp](#)), for annotating matrisome components across multimodal omics
- **MatriSPACE** ([ShinyApp](#)), for the interrogation of matrisome and EV genes and signatures expression in spatial transcriptomics datasets
- **MatriCOM** ([ShinyApp](#)), a tool to study cell-extracellular matrix communication in scRNA-seq data

Post-doc (08.2016 - 03.2022) **University of Turku**, Institute of Biomedicine, [Mattila Lab](#). I had the **leading role** in the following projects:

- **AutoCoEv**: a bioinformatics pipeline for the large-scale screening for co-evolution between proteins. ([Petrov et al, 2022](#); [GitHub](#))
- **Evolutionary characterization** of the conserved *MTSS1* gene. ([Petrov et al, 2019](#); [GitHub](#)).

I was **actively involved** in these projects:

- APEX2 proximity biotinylation reveals protein dynamics triggered by B cell receptor activation ([Awoniyi et al, 2023](#))
- Immunological and functional analysis of the membrane modulator *MTSS1* ([Sarapulov et al, 2020](#)).
- Antigen processing, vesicular transport and presentation in B cells. ([Hernández-Pérez, et al 2019](#)).

Previously, I held three consecutive positions in the Department of Medical Microbiology and Immunology at University of Oulu.

- **Researcher** (01-04.2016) on lymphocyte apoptosis
- **PhD student** (07.2008 - 12.2015), working on lymphocyte development, apoptosis and molecular evolution
- **Research assistant** (02.2005 - 06.2008) on lymphocyte development

Summer intern (2002, 2003)

- Department of Microbiology, University of Turku.

Degrees

PhD - Immunology and Cell Biology (2015), University of Oulu (Finland), Department of Medical Microbiology and Immunology

- **Dissertation** done in the Lymphocyte Development lab of Prof. Olli Vainio: '[Leukocyte protein Trojan, as a candidate for apoptotic regulatory role](#)'
- **Papers**: [Petrov et al 2010](#); [Petrov et al 2015](#); [Petrov et al 2017](#)

MSc - Biochemistry and Molecular Biology (2008), University of Oulu (Finland), Department of Biochemistry

- **Thesis**: 'Trojan: a novel avian lymphocyte surface protein, involved in T cell development', done in Olli Vainio lab; **Grade**: excellent

BSc - Biotechnology (2004), University of Perugia (Italy)

- **Thesis**: 'Biochemical characterization of a novel T cell surface molecule, Trojan', done in Olli Vainio lab, University of Turku (Finland);

Speaker at symposia and seminars

2020 Annual Receptor Symposium at University of Turku, Online, November.
Talk topic: AutoCoEv – a high-throughput *in silico* pipeline for predicting novel protein-protein interactions.

Previous supervisors

Docent **Pieta Mattila** (former post-doc supervisor, University of Turku): pieta.mattila@utu.fi
Prof. **Olli Vainio** (former PhD supervisor, University of Oulu, *retired*): olli.vainio@utu.fi

Publications

Gabir H, Nicolau M, Legare S, Thomas J, Vidda C, Roshko R, Bailey-Elkin B, Jakob D, Chellamani S, Less B, Mörgelin M, **Petrov P**, Izzi V, Taran F-A, Meier M, Koch M, Reuten R, Stetefeld J. Loss of Structural Calcium upon Netrin-4/Laminin γ 1 **Complex Formation Dictates Basement Membrane Softening Shielding from Pan-Cancer Metastasis**. *Manuscript*

Petrov PB, Considine JM, Izzi V, Naba A. **Matrisome AnalyzerR - a suite of tools to annotate and quantify ECM molecules in big datasets across organisms**. *J Cell Sci*. **2023** Sep 1;136(17):jcs261255. doi: 10.1242/jcs.261255. Epub 2023 Sep 4. PMID: 37555624; PMCID: PMC10499032.

Awoniyi LO, Cunha DM, Sarapulov AV, Hernández-Pérez S, Runsala M, Tejeda-González B, Šuštar V, Balci MÖ, **Petrov P**, Mattila PK. **B cell receptor-induced protein dynamics and the emerging role of SUMOylation revealed by proximity proteomics**. *J Cell Sci*. **2023** Aug 1;136(15):jcs261119. doi: 10.1242/jcs.261119. Epub 2023 Aug 8. PMID: 37417469; PMCID: PMC10445728.

Petrov PB, Awoniyi LO, Šuštar V, Balci MÖ, Mattila PK. **AutoCoEv-A High-Throughput In Silico Pipeline for Predicting Inter-Protein Coevolution**. *Int J Mol Sci*. **2022** Mar 20;23(6):3351. doi: 10.3390/ijms23063351. PMID: 35328772; PMCID: PMC8952222.

Sarapulov AV, **Petrov P**, Hernández-Pérez S, Šuštar V, Kuokkanen E, Cords L, Samuel RVM, Vainio M, Fritzsche M, Carrasco YR, Mattila PK. **Missing-in-Metastasis/Metastasis Suppressor 1 Regulates B Cell Receptor Signaling, B Cell Metabolic Potential, and T Cell-Independent Immune Responses**. *Front Immunol*. **2020** Apr 16;11:599. doi: 10.3389/fimmu.2020.00599. PMID: 32373113; PMCID: PMC7176992.

Hernández-Pérez S, Vainio M, Kuokkanen E, Šuštar V, **Petrov P**, Forstén S, Paavola V, Rajala J, Awoniyi LO, Sarapulov AV, Vihinen H, Jokitalo E, Bruckbauer A, Mattila PK. **B cells rapidly target antigen and surface-derived MHCII into peripheral degradative compartments**. *J Cell Sci*. **2019** Dec 20;133(5):jcs235192. doi: 10.1242/jcs.235192. PMID: 31780582.

Petrov P, Sarapulov AV, Eöry L, Scielzo C, Scarfò L, Smith J, Burt DW, Mattila PK. **Computational analysis of the evolutionarily conserved Missing In Metastasis/Metastasis Suppressor 1 gene predicts novel interactions, regulatory regions and transcriptional control**. *Sci Rep*. **2019** Mar 11;9(1):4155. doi: 10.1038/s41598-019-40697-1. PMID: 30858428; PMCID: PMC6411742.

Petrov P, Syrjänen R, Uchida T, Vainio O. **Leucocyte protein Trojan, a possible regulator of apoptosis**. *APMIS*. **2017** Feb;125(2):106-113. doi: 10.1111/apm.12641. Epub **2016** Dec 28. PMID: 28028869.

Petrov P, Syrjänen R, Smith J, Gutowska MW, Uchida T, Vainio O, Burt DW. **Characterization of the avian Trojan gene family reveals contrasting evolutionary constraints**. *PLoS One*. **2015** Mar 24;10(3):e0121672. doi: 10.1371/journal.pone.0121672. PMID: 25803627; PMCID: PMC4372362.

Syrjänen R, **Petrov P**, Glumoff V, Fang S, Salven P, Savolainen ER, Vainio O, Uchida T. **TIM-family molecules in embryonic hematopoiesis: fetal liver TIM-4(lo) cells have myeloid potential**. *Exp Hematol*. **2014** Mar;42(3):230-40. doi: 10.1016/j.exphem.2013.11.014. Epub 2013 Dec 4. PMID: 24316337.

Petrov P, Motobu M, Salmi J, Uchida T, Vainio O. **Novel leukocyte protein, Trojan, differentially expressed during thymocyte development**. *Mol Immunol*. **2010** Apr;47(7-8):1522-8. doi: 10.1016/j.molimm.2010.01.017. Epub 2010 Feb 18. PMID: 20170963.