Nikoleta Psatha, PhD

Assistant Professor

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Background and Research Interests

I received a B.S. in Molecular Biology and Genetics from Democritus University of Thrace and obtained my PhD in Biology from the Aristotle University of Thessaloniki. My graduate thesis investigating protocols for optimal hematopoietic stem cell mobilization was performed in collaboration with George Papanikolaou Hospital and was supervised by Dr. Evangelia Yannaki. My first postdoctoral position was in the laboratories of Prof. Thalia Papayannopoulou and late Prof. George Stamatoyannopoulos, University of Washington, where I developed novel genome editing methods as therapeutic tools for beta-hemoglobinopathies. I then joined the Altius Institute for Biomedical Sciences as a Scholar where I studied the regulatory mechanisms of adult erythropoiesis under the guidance of Dr. Jeff Vierstra and John Stamatoyannopoulos. In 2021, I briefly joined the lab of Prof. Stein Aerts in VIB/KU Leuven, Belgium to explore cell type specific enhancers with implications towards gene therapy. I currently hold an Assistant Professor position at the School of Biology, Faculty of Sciences, Aristotle University of Thessaloniki. My current research involves the use of high-scale genomic data to identify lineage specific DNA regulatory elements such as chromatin insulators and transcriptional enhancers governing cell differentiation and development towards the generation of optimized gene therapy vectors.

Positions

2022–present
Assistant Professor
Aristotle University of Thessaloniki, Thessaloniki, GR
•Undergraduate Courses: Developmental Biology, Mechanisms of Differentiation, Animal and plant biotechnology
•Research: Developmental Hematology, Genome/Epigenome editing, Gene Therapy

2021–2021
Senior Fellow
VIB-KU Leuven Center for Brain & Disease Research, Leuven, BE
• Gene regulation, Cell differentiation

2018–2021
Faculty Scholar
Altius Institute for Biomedical Sciences, Seattle, WA, USA
Project leader
• Genome editing, Medical Genetics, Developmental Hematology

2018–2020
Scientific Advisor
George Papanikolaou Hospital, Thessaloniki, Greece
• Genome editing, Cell therapy

2014–2018
Postdoctoral Fellow
University of Washington, Seattle, WA, USA
• Ex vivo genome editing, In vivo gene therapy, Developmental Hematology, Erythropoiesis

2014–2014
Postdoctoral Fellow
George Papanikolaou Hospital, Thessaloniki, GR
• Hematopoietic Stem Cell Expansion and Maintenance

2009–2014
Graduate student
Aristotle University of Thessaloniki, Thessaloniki, GR
PhD Thesis:
• Hematopoietic Stem Cell Mobilization, Ex vivo gene therapy

Education

2014–2007 PhD in Genetics, Development and Molecular Biology
Aristotle University of Thessaloniki, Faculty of Sciences, School of Biology, Thessaloniki, Greece

2002–2007 B.S. in Molecular Biology and Genetic Engineering
Democritus University of Thrace, Department of Molecular Biology and Genetics

Lab techniques

• In vitro: flow cytometry, immunohistochemistry, FISH,ELISA, Q-PCR, plasmid cloning, Lentiviral packaging, titration and large scale production, HPLC, ATAC-seq, NGS

• Ex vivo: primary (T-cells, HSCs) and immortalized cell culture and differentiation, AAV-Adeno- and Lenti-viral transduction, electroporation, cell sorting and magnetic cell isolation, CRISPR/Cas9, ZFN and TALEN genome and epigenome editing

• Preclinical: mobilization, primary cell transplantation in small animal models, tissue collection, i.v., i.p., s.c., injections, genotyping

• Data Analysis: R, Prism, Minitab

Personal funding

2021-2023 European Hematology Association Advanced Research Grant 160.000€
2018–2020 American Society of Hematology Scholar Award $100.000
2017–2018 Cooley's Anemia Foundation Research Scholar Award $35.000
2016–2017 Core Center of Excellence in Hematology Pilot & Feasibility Award, $25.000.

Publication metrics

Citations: 671
H-index: 13
i10-index: 15
>15 Travel and Abstract Awards in International Conferences
Complete list of publications: Google Scholar Page

Selected publications in SCI Journals

-Discrete regulatory modules instruct hematopoietic lineage commitment and differentiation. Georgolopoulos G*, Psatha N*, Iwata M, Nishida A, Som T, Yiangou M, Stamatoyannopoulos JA, Vierstra J. Nat Commun. 2021

-Enhanced HbF reactivation by multiplex mutagenesis of thalassemic CD34+ cells in vitro and in vivo. Psatha N, Georgakopoulou A, Li C, Nandakumar V, Georgolopoulos G, Acosta R, Paschoudi K, Nelson J, Chee D, Athanasiadou A, Kouvatsi A, Funnell APW, Lieber A, Yannaki E, Papayannopoulou T. Blood. 2021

-In vivo hematopoietic stem cell gene therapy ameliorates murine thalassemia intermedia. Wang H, Georgakopoulou A, Psatha N, Li C, Capsali C, Samal HB, Anagnostopoulos A, Ehrhardt A, Izsvák Z, Papayannopoulou T, Yannaki E, Lieber A. J Clin Invest. 2019

-Disruption of the BCL11A Erythroid Enhancer Reactivates Fetal Hemoglobin in Erythroid Cells of Patients with β-Thalassemia Major. Psatha N, Reik A, Phelps S, Zhou Y, Dalas D, Yannaki E, Levasseur DN, Urnov FD, Holmes MC, Papayannopoulou T. Mol Ther Methods Clin Dev. 2018

-Reactivation of γ-globin in adult β-YAC mice after ex vivo and in vivo hematopoietic stem cell genome editing. *Li C, *Psatha N, Sova P, Gil S, Wang H, Kim J, Kulkarni C, Valensisi C, Hawkins RD, Stamatoyannopoulos G, Lieber A. Blood. 2018

-A Differential Transcriptomic Profile of Ex Vivo Expanded Adult Human Hematopoietic Stem Cells Empowers Them for Engraftment Better than Their Surface Phenotype. Psatha N, Georgolopoulos G, Phelps S, Papayannopoulou T. Stem Cells Transl Med. 2017

-Plerixafor+G-CSF-mobilized CD34+ cells represent an optimal graft source for thalassemia gene therapy. Karponi G, Psatha N, Lederer CW, Adair JE, Zervou F, Zogas N, Kleanthous M, Tsatalas C, Anagnostopoulos A, Sadelain M, Rivière I, Stamatoyannopoulos G, Yannaki E. Blood. 2015

-Functional footprinting of regulatory DNA. Vierstra J, Reik A, Chang KH, Stehling-Sun S, Zhou Y, Hinkley SJ, Paschon DE, Zhang L, Psatha N, Bendana YR, O'Neil CM, Song AH, Mich AK, Liu PQ, Lee G, Bauer DE, Holmes MC, Orkin SH, Papayannopoulou T, Stamatoyannopoulos G, Rebar EJ, Gregory PD, Urnov FD, Stamatoyannopoulos JA. Nat Methods. 2015

Languages

Greek, native proficiency • English, full professional proficiency