

# Heghine Khazhak Gevorgyan

✉ heghine.gevorgyan@ysu.am



## Research Institute of Biology

Laboratory of Microbiology, Bioenergetics and Biotechnology  
Researcher

## Education

---

<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Faculty of Biology, Department of Biochemistry, Microbiology and Biotechnology
<b>Date</b>	2018 - 2021
<b>Degree name</b>	PhD student

---

<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Faculty of Biology, Department of Biochemistry, Microbiology and Biotechnology
<b>Date</b>	2016 - 2018
<b>Degree name</b>	Masters

---

<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Faculty of Biology, Department of Biochemistry
<b>Date</b>	2012 - 2016
<b>Degree name</b>	Bachelor

## Scientific Rank/degree

---

<b>Institution</b>	Yerevan State University
<b>Date</b>	2021
<b>Degree name</b>	Candidate
<b>Specialty</b>	Biological sciences
<b>Scientific Supervisor</b>	Trchounian Karen Armen
<b>Research Topic</b>	The interaction between proton FOF1-ATPase and formate-hydrogen lyase during fermentation of a mixture of different carbon sources

## Language skills

---

Հայերեն English Русский

## Work experience

---

<b>Institution</b>	YSU, Faculty of Biology, Biology research institute, Laboratory of Microbiology, Bioenergetics and Biotechnology
--------------------	--

<b>Period of time</b>	2023 till now
<b>Rank/degree</b>	Scientific Researcher
<b>Institution</b>	YSU, Faculty of Biology, Biology research institute, Laboratory of Basic and Pathological Biochemistry, Faculty of Biology, YSU
<b>Period of time</b>	2021 - 2023
<b>Rank/degree</b>	Junior Scientific Researcher
<b>Institution</b>	YSU, Faculty of Biology, Department of Biochemistry, Microbiology and Biotechnology
<b>Period of time</b>	2021 - 2023
<b>Rank/degree</b>	Administrative assistant
<b>Institution</b>	YSU, Faculty of Biology, Department of Biochemistry, Microbiology and Biotechnology
<b>Period of time</b>	2021 till now
<b>Rank/degree</b>	Assistant Professor
<b>Institution</b>	YSU, Faculty of Biology, Biology research institute, Laboratory of Biochemistry
<b>Period of time</b>	2019 - 2021
<b>Rank/degree</b>	Laboratory assistant
<b>Institution</b>	YSU, Faculty of Biology, Department of Biochemistry, Microbiology and Biotechnology
<b>Period of time</b>	2018 - 2021
<b>Rank/degree</b>	PhD student

## Participation in international conferences and seminars

<b>30/06/2022 - 02/07/2022</b>	FEMS Conference on Microbiology Serbia
<b>20/10/2021 - 22/10/2021</b>	Biotechnology: Science and Practice Innovation and Business Armenia
<b>08/08/2021 - 12/08/2021</b>	TUBA World Conference on Energy Science and Technology Turkey
<b>07/06/2021 - 11/06/2021</b>	XI International Scientific Conference «Microbial biotechnologies: fundamental and applied aspects» - Belarus

<b>20/06/2021 - 24/06/2021</b>	World Microbe Forum United States of America (the)
<b>26/11/2020 - 27/11/2020</b>	THE 7TH INTERNATIONAL RENEWABLE AND CLEAN ENERGY CONFERENCE Armenia
<b>29/10/2020 - 31/10/2020</b>	V INTERNATIONAL CONFERENCE OF BIOTECHNOLOGY AND HEALTH Armenia
<b>16/11/2020 - 18/11/2020</b>	Microbial Stress 2020 Italy
<b>11/11/2019 - 13/11/2019</b>	Modern trends in Biochemistry, Radiation and Space Biology: The Great Sissakian and importance of his research Yerevan State University Armenia
<b>06/07/2019 - 11/07/2019</b>	The 44th Congress of the Federation of European Biochemical Societies Poland
<b>07/07/2018 - 12/07/2018</b>	The 43rd Congress of the Federation of European Biochemical Societies Czech Republic (the)

## Membership

<b>Institution</b>	Armenian Microbiological Association (FEMS member society)
<b>Period of time</b>	2018 till now
<b>Institution</b>	All-Armenian Association of Biochemists, FEBS constituent society
<b>Period of time</b>	2018 till now
<b>Institution</b>	ArMicro ASM student chapter, Yerevan, Armenia
<b>Period of time</b>	2018 till now
<b>Institution</b>	American Society for Microbiology (ASM)
<b>Period of time</b>	2017 till now
<b>Institution</b>	European Federation of Biotechnology (EFB)
<b>Period of time</b>	2021 till now

## Publications

*Article*

**Role of the FhIA transcriptional activator in metabolic changes in Escherichia coli during**

**fermentation of mixed carbon sources at acidic pH**

Heghine Gevorgyan, Marine Parsadanyan, Anait Vassilian, Anna Poladyan, Karen Trchounian

Biochimie 2025 1-9

---

*Article*

**FOF1-ATPase mediates regulation of fermentation and energy metabolism at pH 5.5**

Heghine Gevorgyan, Karen Trchounian

Scientific Reports 2025 35873

---

*Article*

**Regulation of metabolism and proton motive force generation during mixed carbon fermentation by an Escherichia coli strain lacking the FOF1-ATPase**

Heghine Gevorgyan, Lilit Baghdasaryan, Karen Trchounian

Biochimica et Biophysica Acta - Bioenergetics 2024 149034

---

*Article*

**Proton conductance and regulation of proton/potassium fluxes in Escherichia coli FhIA-lacking cells during fermentation of mixed carbon sources**

Heghine Gevorgyan, Anna Poladyan, Karen Trchounian, Anait Vassilian

Archives of Biochemistry and Biophysics 2024 109999

---

*Article*

**Propionic and valproic acids have an impact on bacteria viability, proton flux and ATPase activity**

Heghine Gevorgyan, Tamara Abaghyan, Margarita Mirumyan, Konstantin Yenkovyan, Karen Trchounian

Journal of Bioenergetics and Biomembranes 2023 397-408

---

*Article*

**The influence of hydrogen production on the formation of metabolic pathways and regulation of  $\Delta$ pH in Escherichia coli**

Heghine Gevorgyan, Anait Vassilian, Anna Poladyan, Karen Trchounian

International Journal of Hydrogen Energy 2022 40264-40274

---

*Article*

**Metabolic pathways and  $\Delta$ pH regulation in Escherichia coli during the fermentation of glucose and glycerol in the presence of formate at pH 6.5: the role of FhIA transcriptional activator**

Heghine Gevorgyan, Satenik Khalatyan, Anait Vassilian, Karen Trchounian

FEMS Microbiology Letters 2022 1-9

---

*Manual*

**FERMENTATION**

HEGHINE GEVORGYAN, KAREN TRCHOUNIAN

2022 76

---

*Article*

**Interdependence of Escherichia coli formate dehydrogenase and hydrogen-producing hydrogenases during mixed carbon sources fermentation at different pHs**

Karen Trchounian, Heghine Gevorgyan, Gary Sawers, Armen Trchounian

International Journal of Hydrogen Energy 2021 5085-5099

---

Article

**The role of Escherichia coli FhIA transcriptional activator in generation of proton motive force and FOF1-ATPase activity at pH 7.5**

Heghine Gevorgyan, Satenik Khalatyan, Anait Vassilian, Karen Trchouian

IUBMB Life (International Union of Biochemistry and Molecular Biology Life) 2021 883-892

---

Article

**INDUSTRIAL WASTE-BASED HYDROGEN PRODUCTION TECHNOLOGY: THE PROFITABILITY FOR INDUSTRIAL WASTE GENERATORS**

Liana Vanyan, Heghine Gevorgyan, Hripsime Petrosyan, Armen Trchounian, Karen Trchounian

ՎԵՐԱԿԱՆՔՆԿՈՂ ԵՎ ՄԱՔՈՒՐ ԷՆԵՐԳԻԱՅԻ 7-ՐԴ ՄԻՋԱԶԳԱՅԻՆ ՀԱՄԱԺՈՂՈՎԻ ՆՅՈՒԹԵՐ 2021 56-59

---

Article

**THE EFFECT OF MOLECULAR HYDROGEN GENERATION ON THE METABOLIC NETWORK FORMATION DURING FERMENTATION OF MIXED CARBON SOURCES IN Escherichia coli AT pH 7.5**

Heghine Gevorgyan, Armen Trchounian, Karen Trchounian

ՎԵՐԱԿԱՆՔՆԿՈՂ ԵՎ ՄԱՔՈՒՐ ԷՆԵՐԳԻԱՅԻ 7-ՐԴ ՄԻՋԱԶԳԱՅԻՆ ՀԱՄԱԺՈՂՈՎԻ ՆՅՈՒԹԵՐ 2021 60-64

---

Article

**THE ROLE OF PROTON ATPASE SPECIFIC INHIBITOR N,N'-DICYCLOHEXYLCARBODIIMIDE AND EXTERNAL FORMATE CONCENTRATION ON E. COLI GROWTH DURING MIXED CARBON SOURCES FERMENTATION AT DIFFERENT PHs**

Heghine Kh. Gevorgyan, Anait V. Vassilian, Karen A. Trchounian

Proceedings of the YSU B: Chemical and Biological Sciences 2021 67-74

---

Manual

**Մանրէների կենսաքիմիա և կենսատեխնոլոգիա. լաբորատոր աշխատանքներ**

Կարեն Թռչունյան, Հեղինե Գևորգյան, Լուսինե Կարապետյան

2021 130

---

Article

**Formate and potassium ions affect Escherichia coli proton ATPase activity at low pH during mixed carbon fermentation**

Heghine Gevorgyan, Armen Trchounian, Karen Trchounian

IUBMB Life (International Union of Biochemistry and Molecular Biology Life) 2020 915-921

---

Article

**THE UTILIZATION OF CARBON SOURCES MIXTURE (GLUCOSE, GLYCEROL AND FORMATE) AND GENERATION OF FERMENTATION END-PRODUCTS BY ESCHERICHIA COLI**

H. Kh. GEVORGYAN

Proceedings of the YSU B: Chemical and Biological Sciences 2020 55-62

---

Article

**Understanding the role of Escherichia coli hydrogenases and formate dehydrogenases in the FOF1-ATPase activity during the mixed acid fermentation of mixture of carbon sources**

Heghine Gevorgyan, Armen Trchounian, Karen Trchounian

IUBMB Life (International Union of Biochemistry and Molecular Biology Life) 2018 1040-1047

---

Conference

**The impact of FOF1-ATPase on H<sub>2</sub> producing hydrogenase activity in Escherichia coli during mixed carbon sources fermentation**

H. Gevorgyan, S. Mirzoyan, A. Trchounian, K. Trchounian

---

*Conference*

**Investigation of Escherichia coli bacteria growth during fermentation of mixed carbon sources at different external formate concentration**

HEGHINE GEVORGYAN, ARMEN TRCHOUNIAN, KAREN TRCHOUNIAN

---

*Conference*

**Interaction of membrane-bound enzymes related to proton transport and hydrogen production in Escherichia coli at acidic pH**

Heghine Gevorgyan, Armen Trchounian, Karen Trchounian

---

*Conference*

**Simultaneous Utilization of Glucose and Glycerol in the Presence of External Formate by E. coli at Slightly Alkaline Ph**

Karen Trchounian, Armen Trchounian, Heghine Gevorgyan, Anait Vassilian

---

*Conference*

**THE SIGNIFICANT ROLE OF FH<sub>LA</sub> PROTEIN IN ESCHERICHIA COLI GROWTH, PROTON ATPASE ACTIVITY AND ΔPH REGULATION DURING MIXED CARBON FERMENTATION AT PH 6.5**

Heghine Gevorgyan Khazhak

---

*Conference*

**pH homeostasis in Escherichia coli at acidic pH during fermentation of glucose and glycerol in the presence of external formate**

Heghine Gevorgyan, Armen Trchounian, Karen Trchounian

---

*Conference*

**Study of Co-Fermentation of Glucose and Glycerol in the Presence of External Formate in Escherichia Coli Bacteria at pH 6.5. The Role of Fh<sub>la</sub> Regulatory Protein**

H. Gevorgyan, S. Khalatyan, A. Trchounian, K. Trchounian

---

*Conference*

**The Role of Hydrogenases on the Interplay Between Potassium Transport System and FOF1-ATPase During the Co-fermentation of Mixed Carbon Sources in E. coli at pH 7.5**

H. Gevorgyan, K. Trchounian

---

*Conference*

**The Role of Molecular Hydrogen Generation in the Metabolic Flux During Co-utilization of Mixed Carbon Sources in Escherichia coli at pH 6.5**

H. Gevorgyan, K. Trchounian

---

*Conference*

**The Role of Fh<sub>IA</sub> Regulatory Protein in Escherichia coli ATPase Activity at pH 5.5 During Fermentation of Mixed Carbon Sources**

S. Khalatyan, H. Gevorgyan, K. Trchounian

---

*Conference*

**Role of fhIA Regulatory Protein in the Assimilation of Substrates and Generation of Fermentation End-products in Escherichia coli at Acidic pH**

S. Khalatyan, H. Gevorgyan, K. Trchounian

---

*Conference*

**The role of formate neutralization and molecular hydrogen generation in the metabolic flux in Escherichia coli during fermentation of mixed carbon sources**

Gevorgyan H., Poladyan A., Trchounian K.

---

*Conference*

**INFLUENCE OF BIOHYDROGEN PRODUCTION ON THE RATIO OF GENERATED ACIDS AND REGULATION OF  $\Delta$ pH IN E. coli DURING FERMENTATION OF MIXED CARBON SOURCES AT pH 7.5**

Heghine Gevorgyan, Karen Trchounian

---

*Conference*

**The contribution of proton ATPase in E. coli growth during mixed carbon sources fermentation at different pHs**

Heghine Gevorgyan, Lilit Baghdasaryan, Anait Vassilian, Karen Trchounian

---

*Conference*

**Role of E. coli potassium transporters in proton / potassium flux during mixed carbon fermentation at pH 7.5**

Heghine Gevorgyan, Mariam Danielyan, Anait Vassilian, Karen Trchounian

---

*Conference*

**ՕՐԳԱՆԱԿԱՆ ԹԱՓՈՆՆԵՐԻՑ ԿԵՆՍԱԶԱՆԳՎԱԾԻ ԵՎ ԿԵՆՍԱԵՆԵՐԳԻԱՅԻ ՓՈԽԱԿԵՐՊՄԱՆ ԿԵՆՍԱԶԹԻՄԻԱԿԱՆ ՈՐԴԻՆԵՐԻ ԲՆՈՒԹԱԳՐՈՒՄԸ ԵՎ ՕՔՍԻԴԱԿԵՐԱԿԱՆԳՈՂԱԿԱՆ ԿԱՐԳԱՎՈՐՈՒՄԸ**

Փոլադյան Ա.Ա., Գևորգյան Հ.Խ., Վանյան Լ.Մ., Բաբայան Ա.Ռ., Բաղդասարյան Լ.Հ., Վասիլյան Ա.Վ.,

Պետրոսյան Հ.Հ.

---

*Conference*

**Influence of acidic pH on the interaction between proton ATPase and enzymes responsible for molecular hydrogen generation**

Karen Trchounian, Heghine Gevorgyan, Lilit Baghdasaryan, Anait Vassilian, Anna Poladyan

---

*Conference*

**The penetration of PPA is mediated with H<sup>+</sup> efflux in Gram-negative and Grampositive bacteria**

Tamara Abaghyan, Heghine Gevorgyan, Margatita Mirumyan, Konstantin Yenkovyan, Karen Trchounian

---

*Conference*

**Formate-hydrogen lyase has a significant role in proton motive force generation in Escherichia coli at acidic pH during mixed carbon fermentation**

Heghine Gevorgyan, Anait Vassilian, Anna Poladyan, Karen Trchounian

---

*Conference*

**Exploring the role of propionic acid: link between gut microbiome and neurodevelopmental disorders**

T. Abaghyan, H. Gevorgyan, M. Mirumyan, K. Yenkovyan, K. Trchounian

---

*Conference*

**The regulation of ATPase activity by K<sup>+</sup> ions in gut isolated E. coli strains and its role in propionic acid sensing**

Tamara E. Abaghyan, Heghine Gevorgyan, Margarita Mirumyan, Konstantin Yenkovyan, Karen Trchounian

---

*Conference*

**Contribution of Proton ATPase in the Formation of Proton Motive Force in Escherichia coli during Mixed Carbon Fermentation at pH 5.5**

H.Gevorgyan, K.Trchounian

---

*Conference*

**Effects of Amino Acid Mutations in E. coli DcuD Transporters in Proton Flux at pH 7.5**

H.Gevorgyan, L.Jorkntsyan, A.Valle, J.Bolivar, K.Trchounian

---

*Conference*

**Proton and Potassium Flux Alterations in the Presence of Propionic Acid in Gut-Isolated Escherichia coli**

H. Gevorgyan, T. Abaghyan, K. Yenkovyan, K. Trchounian

---

*Conference*

**Impact of short-chain fatty acids on the anaerobic growth of Escherichia coli K12 and Enterococcus hirae ATCC9790**

Tamara Abaghyan, Heghine Gevorgyan, Karen Trchounian

---

*Conference*

**Gad Acid Resistance System Plays a Critical Role in Escherichia Coli Growth, Significantly Influencing the Extracellular pH During Fermentation**

Heghine Gevorgyan, Kirsten Jung, Karen Trchounian

---

*Conference*

**The Impact of Different Concentrations of Formate and Lactate on Escherichia coli Growth Properties and H<sub>2</sub> Production**

Tamara Abaghyan, Heghine Gevorgyan, Karen Trchounian

---