

# Anait Veller Vassilian

## Research Institute of Biology

Group for Biochemical Conversion of Organic Waste and Microbiological Production

Senior researcher

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## Education

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<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Biology
<b>Date</b>	1979 - 1984
<b>Degree name</b>	Qualified specialist

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## Scientific Rank/degree

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<b>Institution</b>	Yerevan State University
<b>Date</b>	2005
<b>Degree name</b>	Associate professor
<b>Specialty</b>	Biological sciences

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<b>Institution</b>	Yerevan State University
<b>Date</b>	1993
<b>Degree name</b>	Candidate
<b>Specialty</b>	Biological sciences
<b>Scientific Supervisor</b>	Prof, Armen Trchounian
<b>Research Topic</b>	ATPase activity of membranes of unc and trk mutants of anaerobically grown Escherichia coli

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## Language skills

Русский English

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## Work experience

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<b>Institution</b>	Yerevan State University
<b>Period of time</b>	2005 till now
<b>Rank/degree</b>	Associate Professor at the Department of Ecology and Nature Protection

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<b>Institution</b>	Yerevan State University
<b>Period of time</b>	2000 - 2005
<b>Rank/degree</b>	Assistant Professor at the Department of Ecology and Nature Protection

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<b>Institution</b>	The University of Chicago IL, USA
<b>Period of time</b>	1998 - 1998
<b>Rank/degree</b>	Researcher at the Department of Molecular Genetics and Cell Biology /MGCB/ University of Chicago, IL USA /Prof. M. Fonstein/ IHFSPO UNESCO
<b>Institution</b>	The University of Chicago IL, USA
<b>Period of time</b>	1995 - 1996
<b>Rank/degree</b>	Researcher at the Department of Molecular Genetics and Cell Biology /MGCB/ University of Chicago, IL USA /Prof. B. Strauss/ IHFSPO UNESCO
<b>Institution</b>	The University of Chicago IL, USA
<b>Period of time</b>	1991 - 1992
<b>Rank/degree</b>	Researcher at the Department of Molecular Genetics and Cell Biology /MGCB/ University of Chicago, IL USA /Prof. B. Strauss/ International Human Frontier Science Program
<b>Institution</b>	Yerevan State University
<b>Period of time</b>	1988 - 2000
<b>Rank/degree</b>	Senior laboratory assistant at the Department of Plants Physiology and Anatomy
<b>Institution</b>	Yerevan State University
<b>Period of time</b>	1984 - 1988
<b>Rank/degree</b>	Laboratory assistant at the Department of Plants Physiology and Anatomy



## Scientific interests

- Biochemistry, Environmental Science, Microbiology and Biotechnology



## Participation in international conferences and seminars

<b>01/11/1991 - 01/09/1992</b>	Researcher at the Department of Molecular Genetics and Cell Biology, Prof. B. Strauss University of Chicago United States of America (the)
<b>01/12/1995 - 01/03/1996</b>	International Human Frontier Science Program Fellowship, UNESCO University of Chicago United States of America (the)
<b>01/09/1998 - 01/12/1998</b>	International Human Frontier Science Program Fellowship, UNESCO University of Chicago United States of America (the)

**13/06/2016 -** 21st WHEC Congress in Zaragoza, Spain  
**16/06/2016** Spain

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**30/06/2022 -** 2nd FEMS Conference on Microbiology, Belgrade, Serbia  
**02/07/2022** Serbia

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**09/07/2023 -** FEMS2023 Congress in Hamburg, Germany  
**13/07/2023** Germany

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## Publications

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*Article*

**Biotechnological potential of spent coffee grounds for biohydrogen production by Escherichia coli**

Liana Vanyan, Hayarpi Aghekyan, Anait Vassilian, Anna Poladyan, Karen Trchounian

International Journal of Hydrogen Energy 2025 1121-1131

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*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

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*Article*

**Microbial Valorization of Sunflower Husk for Sustainable Biohydrogen and Biomass Production**

Llana Vanyan, Akerke Toleugazykyzy, Kaiser Yegizbay, Ayaulym Daniyarova, Lyudmila Zuloyan, Gayane Mikoyan, Anait Vassilian, Anna Poladyan, Kairat Bekbayev, Karen Trchounian

Energies 2025 3885

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*Article*

**Escherichia coli FocA/B-dependent H<sup>+</sup> and K<sup>+</sup> fluxes: Influence of exogenous versus endogenous formate**

Lilit Grigoryan, Anush Babayan, Anait Vassilian, Anna Poladyan, Gary Sawers, Karen Trchounian

Biophysical Reports 2025 100225

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*Article*

**Biomass and bioethanol production from pretreated mixed fruit peel hydrolysate using Saccharomyces cerevisiae strains at different pH and oxygen conditions**

Anahit Shirvanyan, Ayaulym Daniyarova, Anait Vassilian, Anna Poladyan, Gopalakrishnan Kumar, Duman Orynbekov, Kairat Bekbayev, Karen Trchounian

BMC Biotechnology 2025 136

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*Article*

**Gold nanoparticles activate hydrogenase synthesis and improve heterotrophic growth of Ralstonia eutropha H16**

Tatevik Manutsyan, Syuzanna Blbulyan, Anait Vassilian, Tatiana Semashko, Gayane Kirakosyan,

Lilit Gabrielyan, Karen Trchounian, Anna Poladyan

*Article*

**Growth and hydrogen production by *Escherichia coli* during utilization of sole and mixture of sugar beet, alcohol, and beer production waste**

Kairat Bekbayev, Satenik Mirzoyan, Akerke Toleugazykyzy, Dinara Tlevlessova, Anait Vassilian,

Anna Poladyan, Karen Trchounian

Biomass Conversion and Biorefinery 2024 909-919

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*Article*

**Role of the *Escherichia coli* FocA and FocB formate channels in controlling proton/potassium fluxes and hydrogen production during osmotic stress in energy-limited, stationary phase fermenting cells**

Anush Babayan, Anait Vassilian, Anna Poladyan, Karen Trchounian

Biochimie 2024 91-98

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*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

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*Article*

**L-amino acids affect the hydrogenase activity and growth of *Ralstonia eutropha* H16**

Meri Iskandaryan, Syuzanna Blbulyan, Mayramik Sahakyan, Anait Vassilian, Karen Trchounian,

Anna Poladyan

AMB Express 2023 33

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*Article*

**Osmotic stress as a factor for regulating *E. coli* hydrogenase activity and enhancing H<sub>2</sub> production during mixed carbon sources fermentation**

Anush Babayan, Anahit Vassilian, Karen Trchounian

AIMS Microbiology 2023 724-737

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*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

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*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

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*Article*

**Coffee silverskin as a substrate for biobased production of biomass and hydrogen by *Escherichia coli***

Satenik Mirzoyan, Hayarpi Aghekyan, Liana Vanyan, Anait Vassilian, Karen Trchounian

*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

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*Article*

**Escherichia coli Dcu C4-dicarboxylate transporters dependent proton and potassium fluxes and FOF1-ATPase activity during glucose fermentation at pH 7.5**

Lusine Karapetyan, Gayane Mikoyan, Anait Vassilian, Antonio Valle, Jorge Bolivar, Armen Trchounian,

Karen Trchounian

Bioelectrochemistry 2021 107867

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*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

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*Article*

**External succinate and potassium ions influence Dcu dependent FOF1-ATPase activity and H<sup>+</sup> flux of Escherichia coli at different pHs**

G. Mikoyan, L. Karapetyan, A. Vassilian, A. Trchounian, K. Trchounian

Journal of Bioenergetics and Biomembranes 2020 377-382

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*Article*

**Hydrogen production by Escherichia coli using brewery waste: optimal pretreatment of waste and role of different hydrogenases**

Anna Poladyan, Karen Trchounian, Anait Vassilian, Armen Trchounian

Renewable Energy 2018 931-936

<http://www.journals.elsevier.com/renewable-energy>

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*Article*

**Prolongation of H<sub>2</sub> production during mixed carbon sources fermentation in E. coli batch cultures: New findings and role of different hydrogenases**

Satenik Mirzoyan, Anait Vassilian, Armen Trchounian, Karen Trchounian

International Journal of Hydrogen Energy 2018 8739-8746

[https://www.sciencedirect.com/journal/international-journal-of-hydrogen-energy/...](https://www.sciencedirect.com/journal/international-journal-of-hydrogen-energy/)

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*Article*

**Կրթական ծրագրերում մանրէների բազմազանության և Էկոլոգիայի հիմնահարցերի ընդգրկման անհրաժեշտության մասին**

Ա.Վ. Վասիլյան, Հ.Հ. Փանոսյան, Ա.Հ. Թռչունյան

Բնագետ 2016 36-40

<http://www.ysu.am/bnaget>

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*Article*

**Hydrogen production by Escherichia coli during glucose fermentation: Effects of oxidative and reductive routes used by the strain lacking hydrogen oxidizing hydrogenases 1 (hya) and 2 (hyb)**

Varduhi Abrahamyan, Anna Poladyan, Anait Vassilian, Armen Trchounian

International Journal of Hydrogen Energy 2015 7459-7464

<http://www.journals.elsevier.com/international-journal-of-hydrogen-energy/>

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*Article*

**Oxidative and Reductive Routes of Glycerol and Glucose Fermentation by Escherichia coli Batch Cultures and Their Regulation by Oxidizing and Reducing Reagents at Different pHs**

Anna Poladyan, Anait Vassilian, Armen Trchounian, Arev Avagyan

Current Microbiology 2013 49-55

<http://www.springer.com/life+sciences/microbiology/journal/284>

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*Article*

**Multiple and reversible hydrogenases for hydrogen production by Escherichia coli: dependence on fermentation substrate, pH and the F<sub>0</sub>F<sub>1</sub>-ATPase**

Karen Trchounian, Anna Poladyan, Anait Vassilian, Armen Trchounian

Critical Reviews in Biochemistry and Molecular Biology 2012 236-249

<http://www.tandfonline.com/toc/ibmg20/current>

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*Conference*

**Growth and Hydrogen Production Properties of Escherichia Coli During Fermentation of the Mixture of Glucose, Glycerol and Formate at Di**

K.Trchounian, S. Mirzoyan, P. Romero-Pareja, M. Coello, A. Vassilian, A. Trchounian

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*Conference*

**COMPENSATORY H<sub>2</sub> PRODUCING ACTIVITY OF ESCHERICHIA COLI HYDROGENASES DURING MIXED CARBON SOURCES FERMENTATION**

K. Trchounian, S. Mirzoyan, A. Vassilian, A. Trchounian

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*Conference*

**Effect of Hydrogenases on the F<sub>0</sub>F<sub>1</sub>-ATPase Activity in Escherichia coli During Fermentation of Glucose, Glycerol and Formate**

H. Gevorkyan, A. Vassilian, G. Sawers, A. Trchounian, K. Trchounian

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*Conference*

**H<sub>2</sub> production by Escherichia coli during utilization of lactose or mixture of lactose and glycerol: prolongation of production and role of hydrogenases 1 and 2 at different pH**

Satenik Mirzoyan, Anait Vassilian, Armen Trchounian, Karen Trchounian

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*Conference*

**Relationship of dcu transport system and proton ATPase during glycerol fermentation**

L. Karapetyan, A. Valle, J. Bolivar, A. Vassilian, A. Trchounian, K. Trchounian

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*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

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Conference

**The Role of Escherichia coli FOF1 -ATPase and Hydrogenases on Specific Growth Rate During Glucose Fermentation**

Karen Trchounian, Hripsime Petrosyan, Liana Vanyan, Armen Trchounian, Anait Vassilian

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Conference

**Proton/potassium Fluxes Depend on Glucose Concentration in E. coli at pH 7.5**

Liana Vanyan, Anait Vassilian, Karen Trchounian

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Conference

**Is FHL Complex Responsible for Sensing Glucose Concentration?**

Liana Vanyan, Anait Vassilian, Karen Trchounian

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Conference

**Optimization of Fruits Waste Pretreatment for E. coli Growth and H<sub>2</sub> Production**

S. Mirzoyan, A. Vassilian, A. Poladyan, K. Trchounian

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Conference

**WINE GRAPE WASTE APPLICATION FOR ESCHERICHIA COLI BIOMASS AND H<sub>2</sub> PRODUCTION**

Syuzanna Blbulyan, Lusine Baghdasaryan, Satenik Mirzoyan, Anahit Vassilian, Tatiana Semashko,

Anna Poladyan

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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

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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

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Conference

**ՕՐԳԱՆԱԿԱՆ ԹԱՓՈՆՆԵՐԻՑ ԿԵՆՍԱԶԱՆԳՎԱԾԻ ԵՎ ԿԵՆՍԱԷՆԵՐԳԻԱՅԻ ՓՈԽԱԿԵՐՊՄԱՆ ԿԵՆՍԱՔԻՄԻԱԿԱՆ ՈՐԴԻՆԵՐԻ ԲՆՈՒԹԱԳՐՈՒՄԸ ԵՎ ՕՔՍԻԴԱՎԵՐԱԿԱՆԳՈՂԱԿԱՆ ԿԱՐԳԱՎՈՐՈՒՄԸ**

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

Պետրոսյան Հ.Հ.

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Conference

**Characteristic effects of gold nanoparticles on growth and H<sub>2</sub> metabolism of Ralstonia eutropha H16 and Escherichia coli**

Anna Poladyan, Tatev Manutsyan, Meri Iskandaryan, Syuzanna Blbulyan, Anait Vassilian,

Tatiana Semashko

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Conference

**A NOVEL COST-EFFECTIVE APPROACH FOR PRODUCTION OF HYDROGENASE ENZYMES AND MOLECULAR HYDROGEN FROM WHEY-BASED BY-PRODUCTS**

Anna Poladyan, Meri Iskandaryan, Ofelya Karapetyan, Ela Minasyan, Anait Vassilian, Karen Trchounian,

Garabed Anatronikian

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*Conference*

**BIOTECHNOLOGICAL POTENTIAL OF SPENT COFFEE GROUNDS FOR LARGE-SCALE HYDROGEN PRODUCTION**

Liana Vanyan, Anait Vassilian, Anna Poladyan, Karen Trchounian

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*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

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*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

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*Conference*

**Understanding the Role of Escherichia coli Hydrogenase-2 subunits in proton flux under different glucose concentrations**

Liana Vanyan, Anait Vassilian, Anna Poladyan, Karen Trchounian

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*Conference*

**The role of the Escherichia coli FocA and FocB formate channels in proton flux during fermentation of mixed carbon sources**

Anush Babayan, Anait Vassilian, Anna Poladyan, Karen Trchounian

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*Conference*

**Bioconversion of fruit waste into bioethanol and single-cell protein using Saccharomyces cerevisiae strains**

Anahit Shirvanyan, Ayaulym Daniyarova, Anait Vassilian, Anna Poladyan, Kumar Gopalakrishnan,

Duman Orynbekov, Kairat Bekbayev, Karen Trchounian

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