

Anna Arshak Poladyan

Faculty of Biology

Chair of Biochemistry, Microbiology, and Biotechnology

Head of the chair, associate professor

☎ 45-26

✉ apoladyan@ysu.am



🌐 Language skills

Հայերեն Русский English

🔬 Scientific interests

- Bioenergy, Biochemistry, Microbiology, Biotechnology

🏆 State awards and honorary titles

2016 Morrison Rogosa award of the American Society for Microbiology (ASM)

2019 ԵՊՀ 100-ամյակի կապակցությամբ արժաթե մեդալ

📖 Publications

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

FEMS Microbiology Letters 2024 1-8

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

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

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

Development of an H₂ fuel cell electrochemical system powered by Escherichia coli cells

Torgom Seferyan, Lusine Baghdasaryan, Meri Iskandaryan, Karen Trchounian, Anna Poladyan

Electrochemistry Communications 2024 107746

Article

The antimicrobial effects of silver nanoparticles obtained through the royal jelly on the yeasts Candida guilliermondii NP-4

Seda Marutyan, Hasmik Karapetyan, Lusine Khachatryan, Anna Muradyan, Syuzan Marutyan,

Anna Poladyan, KarenTrchounian

Scientific Reports 2024 19163

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

Article

Valorization of whey-based side streams for microbial biomass, molecular hydrogen, and hydrogenase production

Anna Poladyan, Karen Trchounian, Ela Minasyan, Meri Iskandaryan, Hayarpi Aghekyan, Sargis Aghayan,

Avetis Tsaturyan, Ani Paloyan, Garabed Antranikian, Lev Khoyetsyan

Applied Microbiology and Biotechnology 2023 4683-4696

Article

The influence of hydrogen production on the formation of metabolic pathways and regulation of ΔpH in Escherichia coli

Heghine Gevorgyan, Anait Vassilian, Anna Poladyan, Karen Trchounian

International Journal of Hydrogen Energy 2022 40264-40274

Article

THE EFFECT OF ANTIOXIDANT ACTIVITY OF PLANTS TRIFOLIUM PRATENSE L. AND CRATAEGUS LAEVIGATA ON LIPID PEROXIDATION IN RAT'S TISSUES EXPOSED TO HYPOBARIC HYPOXIA

I. A. BADALYAN, A. A. POLADYAN

Proceedings of the YSU B: Chemical and Biological Sciences 2022 239-244

Article

BIOMASS AND BIOHYDROGEN PRODUCTION BY ESCHERICHIA COLI UPON CONSUMPTION OF MEAT INDUSTRY AND LIGNOCELLULOSIC CORN WASTES MIXTURE

Syuzanna Blbulyan, Satenik Mirzoyan, Karen Trchounian, Anna Poladyan

Proceedings of the YSU B: Chemical and Biological Sciences 2021 224-231

Article

Biomass and biohydrogen production during dark fermentation of Escherichia coli using office paper waste and cardboard

Anna Poladyan, Lena Margaryan, Karen Trchounian, Armen Trchounian
International Journal of Hydrogen Energy 2020 286-293

Article

Application of organic waste glycerol to produce crude extracts of bacterial cells and microbial hydrogenase—the anode enzymes of bio-electrochemical systems

Anna Poladyan, Syuzanna Blbulyan, Tatiana Semashko, Volha Dziameshka, Liudmila Zhukouskaya,

Armen Trchounian

FEMS Microbiology Letters 2020 1-7

Article

ETHANOL SUPPLEMENTATION AS A NEW APPROACH TO REGULATE GROWTH AND HYDROGEN PRODUCTION OF ESCHERICHIA COLI UPON GLYCEROL FERMENTATION

A. A. Poladyan

Proceedings of the YSU B: Chemical and Biological Sciences 2020 138-146

Article

Growth of the facultative chemolithoautotroph *Ralstonia eutropha* on organic waste materials: Growth characteristics, redox regulation and hydrogenase activity

Anna Poladyan, Syuzanna Blbulyan, Mayramik Sahakyan, Oliver Lenz, Armen Trchounian

Microbial Cell Factories 2019 1-13

Article

Characterization of hydrogen production by *Escherichia coli* wild-type and mutants of hydrogenases utilizing xylose as fermentation substrate

Anna Poladyan, Armen Trchounian

Bioenergy Research 2019 1033-1041

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>

Article

***Escherichia coli* wild type and hydrogenase mutant cells growth and hydrogen production upon xylose and glycerol co-fermentation in media with different buffer capacities**

Anna Poladyan, Lusine Baghdasaryan, Armen Trchounian

International Journal of Hydrogen Energy 2018 15870-15879

Article

Enhancement of *Escherichia coli* bacterial biomass and hydrogen production by some heavy metal ions and their mixtures during glycerol vs glucose fermentation at a relatively wide range of pH

Karen Trchounian, Anna Poladyan, Armen Trchounian

International Journal of Hydrogen Energy 2017 6590-6597

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

Article

Hydrogen production by Escherichia coli growing in different nutrient media with glycerol: Effects of formate, pH, production kinetics and hydrogenases involved

Karen Trchounian, Satenik Mirzoyan, Anna Poladyan, Armen Trchounian

International Journal of Hydrogen Energy 2017 24026-24034

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

Article

NEW APPROACHES TO ENHANCE HYDROGEN PRODUCTION FROM GLYCEROL BY ESCHERICHIA COLI

A. Poladyan

Հայաստանի կենսաբանական հանդես 2017 153-159

Article

Optimizing strategy for Escherichia coli growth and hydrogen production during glycerol fermentation in batch culture: Effects of some heavy metal ions and their mixtures

Karen Trchounian, Anna Poladyan, Armen Trchounian

Applied Energy 2016 335-340

<http://www.elsevier.com/locate/apenergy>

Article

Alkanna orientalis (L.) Boiss. plant isolated cultures and antimicrobial activity of their extracts: phenomenon, dependence on different factors and effects on some membrane-associated properties of bacteria.

Margarit Petrosyan, Yekaterina Shcherbakova, Naira Sahakyan, Zaruhi Vardanyan, Anna Poladyan, Yuri Popov, Armen Trchounian

PLANT CELL TISSUE AND ORGAN CULTURE 2015 727-738

<http://link.springer.com/journal/11240>

Article

Escherichia coli growth and hydrogen production in batch culture upon formate alone and with glycerol co-fermentation at different pHs

Karen Trchounian, Varduhi Abrahamyan, Anna Poladyan, Armen Trchounian

International Journal of Hydrogen Energy 2015 9935-9941

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

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/>

Article

Redox stress in geobacilli from geothermal springs: Phenomenon and membrane-associated response mechanisms

Astghik Ghazaryan, Syuzanna Blbulyan, Anna Poladyan, Armen Trchounian

Bioelectrochemistry 2015 1-6

<http://www.journals.elsevier.com/bioelectrochemistry>

Article

Համակարգչային տեխնոլոգիաների կիրառման առավելությունները և փորձը բուհական

կենսաբանության դասավանդման ընթացքում

L.Ս. Գաբրիելյան, Ա.Ա. Փոլադյան, Ա.Հ. Թռչունյան

Բնագետ 2014 139-141

Article

Hydrogen-oxidizing hydrogenases 1 and 2 of Escherichia coli regulate the onset of hydrogen evolution and ATPase activity, respectively, during glucose fermentation at alkaline

evolution and ATPase activity, respectively, during glucose fermentation at alkaline

Anna Poladyan, Karen Trchounian, Armen Trchounian, R. Gary Sawers

FEMS Microbiology Letters 2013 143-148

[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1574-6968](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1574-6968)

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>

Article

Glycerol fermentation and molecular hydrogen production by Escherichia coli batch cultures affected by some reducing reagents and heavy metal ions

Anna Poladyan, Karen Trchounian, Armen Trchounian, Mikayel Minasyants

NATO Science for Peace and Security Series C: Environmental Security, Black Sea Energy Resource

Development and Hydrogen Energy Problems

2013 153-163

<http://www.springer.com/us/book/9789400761513>

Article

Multiple and reversible hydrogenases for hydrogen production by Escherichia coli: dependence on fermentation substrate, pH and the FOF1-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>

Conference

Effect of Different Substrates on Growth and Redox Potential Kinetics of Escherichia coli Wild Type and Hydrogenases Lacking Mutant

Anna Poladyan, Satenik Mirzoyan, Armen Trchounian

Conference

Glycerol Fermentation and Hydrogen Metabolism by Escherichia coli: New Approaches to Enhance Hydrogen Production

A. Poladyan, K. Trchounian, A. Trchounian

Conference

Hydrogen production by Escherichia coli wild type and hydrogenase mutants upon formate and glycerol fermentation under different growth conditions

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

Conference

Developing hydrogen production biotechnology: cheap substrates, effective strains and optimized fermentative conditions

K.Trchounian, A. Poladyan, L. Gabrielyan, A. Trchounian

Conference

Escherichia coli growth and hydrogen production upon glycerol fermentation at slightly acidic pH: effects of formate and some heavy metal ions

Karen Trchounian, Astghik Vardanyan, Anna Poladyan, Armen Trchounian

Conference

Optimization Strategy for Hydrogen Production by Escherichia coli Using Brewery Waste

A. Poladyan, K. Trchounian, A. Trchounian

Conference

H₂ PRODUCTION BY ESCHERICHIA COLI BATCH CULTURES DURING FERMENTATION OF GLYCEROL, LACTOSE AT DIFFERENT pHs

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

Conference

ESCHERICHIA COLI GROWTH AND HYDROGEN PRODUCTION USING BREWERY WASTE: OPTIMAL PRETREATMENT AND ROLE OF HYDROGENASES

A. Poladyan, K. Trchounian, A. Trchounian

Conference

Glucose concentrations influence on activities of FoF₁ ATPase and hydrogenase 4 in Escherichia coli

A. Poladyan, M. Sahakyan, S. Blbulyan, K. Trchounian, A. Trchounian

Conference

ՄԱՆՐԵՆԵՐԻ ԿԵՆՍԱՏԵԽՆՈԼՈԳԻԱՆԵՐԻ ՄԱԳԻՍՏՐՈՍԱԿԱՆ ՆՈՐ ԾՐԱԳՐԵՐԻ ԴԱՍԱԿԱՆԴՄԱՆ ՄԵԹՈԴԱԲԱՆԱԿԱՆ ՍՈՏԵՑՈՒՄՆԵՐԸ ԵՐԵՎԱՆԻ ՊԵՏԱԿԱՆ ՀԱՄԱԼՍԱՐԱՆՈՒՄ

Թռչունյան Կ.Ա., Գաբրիելյան Լ.Ս., Փոլադյան Ա.Ա., Թռչունյան Ա.Հ.

Conference

Growth and Bioenergetics Properties of Facultative Chemolithoautotrophic Bacterium Ralstonia Eutropha Upon Organic Waste Materials Utilization

S. Blbulyan, M. Sahakyan, A. Poladyan, A. Trchounian

Conference

Batch Fermentation Characteristics and Hydrogen Production of Escherichia coli Wild Type and Hydrogenase Mutants Using Xylose As Feedstock

A. Poladyan, R. Hayrapetyan, A. Trchounian

Conference

HYDROGEN PRODUCTION BY BACTERIA: STIMULATION EFFECTS AND RESPONSIBLE HYDROGENASES DURING XYLOSE VS. GLUCOSE DARK FERMENTATION

Anna Poladyan, Lusine Baghdasaryan, Karen Trchounian, Armen Trchounian

Conference

The relationship of Escherichia coli Hyd enzymes with the FOF1-ATPase during fermentation of mixture of carbon sources

H. Gevorgyan, A. Poladyan, A. Trchounian, K. Trchounian

Conference

From organic waste to biohydrogen: Approaches to enhance H₂ production by Escherichia coli

Anna Poladyan, Karen Trchounian, Armen Trchounian

Conference

Анализ использования гидрогеназ Escherichia coli в качестве анодных ферментов

Анна Поладян, Армен Трчунян, Татьяна Семашко, Людмила Жуковская, Ольга Демешко

Conference

From organic wastes to biohydrogen: responsible hydrogenases upon different carbon mixtures utilization by Escherichia coli.

Anna Poladyan, Karen Trchounina, Armen Trchounian

Conference

Hydrogenase Activity of the Facultative Chemolithoautotroph Ralstonia eutropha Consuming Brewery Waste

A. Poladyan, O. Lenz, A. Trchounian

Conference

Ralstonia eutropha Hydrogenase Application in Bioelectrocatalysis as Anode Enzyme

A. Poladyan, T. Semashko, L. Zhukouskaya, V. Dziameshka, A. Trchounian

Conference

Analysis of the Escherichia coli hydrogenases as anodic enzymes in bioelectrochemical system

Anna Poladyan, Tatyana Semashko, Lyudmila Zhukouskaya, Volha Diameshka, Armen Trchounian

Conference

Upcycling of office waste paper and cardboard to biohydrogen

Anna Poladyan, Lena Margaryan, Karen Trchounian, Tatyana Semashko, Armen Trchounian

Conference

Redox regulation of the growth, hydrogenase activity and bioenergetic properties of Ralstonia eutropha upon different carbon source utilization

S. Blbulyan, M. Sahakyan, A. Poladyan, A. Trchounian

Conference

Lignocellulosic waste as feedstock for bacterial biomass production: enhanced hydrogen evolution and hydrogenase activity

Anna Poladyan, Syuzanna Blbulyan, Mayramik Sahakyan, Armen Trchounian

Conference

H₂ - Oxidizing Activity of Escherichia coli Upon Utilization of Different Waste Components

A. Poladyan, L. Baghdasaryan, S. Blbulyan, A. Trchounian

Conference

Ethanol Affected Bacterial Growth and molecular Hydrogen Production by Escherichia coli Upon Fermentation of Glycerol

S.Blbulyan, A. Poladyan, A. Trchounian

Conference

Prospective Trends in Biotechnology for Biohydrogen

Karen Trchounian, Anna Poladyan, Lilit Gabrielyan, Armen 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

Biohydrogen Production from Roasted Coffee Waste: Understanding the Role of E. coli Hydrogenases During Fermentation

S. Mirzoyan, L. Vanyan, H. Aghekyan, A. Poladyan, K. Trchounian

Conference

Optimization of Fruits Waste Pretreatment for E. coli Growth and H₂ Production

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

Conference

Biomass and biohydrogen production by Escherichia coli upon consumption of meat and lignocellulosic waste mixture

Syuzanna Blbulyan, Anna Poladyan, Satenik Mirzoyan, Liana Mnatsakanyan, Karen Trchounian

Conference

WINE GRAPE WASTE APPLICATION FOR ESCHERICHIA COLI BIOMASS AND H₂ PRODUCTION

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

Anna Poladyan

Conference

The valorization of whey-based side-streams for microbial biomass, hydrogen and hydrogenase enzyme production

Anna Poladyan, Hayarpi Aghekyan, Ella Minasyan, Karen Trchounian, Ani Paloyan, Sargis Aghayan,

Garabed Antranikian, Meri Iskandaryan, Diana Ghevondyan

Conference

ՕՐԳԱՆԱԿԱՆ ԹԱՓՈՆՆԵՐԻՑ ԿԵՆՍԱԶԱՆԳՎԱԾԻ ԵՎ ԿԵՆՍԱԵՆԵՐԳԻԱՅԻ ՓՈԽԱԿԵՐՊՄԱՆ

ԿԵՆՍԱԹԻՄԻԱԿԱՆ 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

THE OXIDATIVE STRESS AND POSSIBLE PREVENTIVE ACTION OF PLANT BORN POLYPHENOLS

Anahit Shirvanyan, Anush Babayan, Alvard Minasyan, Margarit Petrosyan, Anna Poladyan,

Naira Sahakyan

Conference

THE OXIDATIVE STRESS AND T2DM-INDUCED DIABETIC NEPHROPATHY: POSSIBLE PREVENTIVE ACTION OF PANT-BORN OLIGOMERIC POLYPHENOLS

Gohar Sahakyan, Anne Vejux, Margarit Petrosyan, Anna Poladyan, Naira Sahakyan

Conference

Characteristic effects of gold nanoparticles on growth and H₂ metabolism of *Ralstonia eutropha* H16 and *Escherichia coli*

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

Tatiana Semashko

Conference

The role of glycine-betaine in the hydrogen metabolism of *Ralstonia eutropha* H16

Meri Iskandaryan, Liana Mnatsakanyan, Anna Poladyan

Conference

Fe ions effect on hydrogenase activity of *Ralstonia eutropha* H16 in various growth media

Sona Nikolyan, Armine Margaryan, Anna Poladyan

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 Antranikian

Conference

REDOX REGULATION OF HYDROGEN PRODUCTION IN *ESCHERICHIA COLI* DURING GROWTH ON BYPRODUCTS OF THE WINE INDUSTRY

Lusine Baghdasaryan, Karen Trchounian, Garabed Antranikian, Anna Poladyan, Ofelya Karapetyan

Conference

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

Liana Vanyan, Anait Vassilian, Anna Poladyan, Karen Trchounian

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

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

The impact of oxygen-tolerant hydrogenases on cell energetics of *Cupriavidus necator* H16

Meri Iskandaryan, Anna Poladyan

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

Conference

Bioenergetic Properties of Microbes as Potential Target for Antibacterial Activity of Plant-Based Compounds

Anna Poladyan, Karen Trchounian, Naira Sahakyan

Conference

Cupriavidus necator H16 growth and H₂-oxidizing Activity Using Mixture of Glycerol and Roasted Coffee Waste

R. Avetisyan, L. Mnatsakanyan, K. Trchounian, A. Poladyan

Conference

Evaluation of an H₂ fuel cell electrochemical system powered by microbial cells

M. Iskandaryan, A. Poladyan, L. Baghdasaryan, T. Seferyan

Conference

Effect of glycine on the heterotrophic growth and [NiFe]-hydrogenase activity of Cupriavidus necator H16

M. Iskandaryan, J. Schoknecht, O. Lenz, A. Poladyan
