

# ԱՆՆԱ ԱՐՉԱԿԻ ՓՈԼԱԴՅԱՆ

## ԿԵՆՍԱԲԱՆՈՒԹՅԱՆ ՖԱԿՈԼՈՒԹԵԱՆ

Կենսաբանության, մանրեաբանության և կենսատեխնոլոգիայի ամբիոն  
Ամբիոնի վարիչ, դոցենտ

45-26

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## Էլեկտրոնային հմացություն

Հայերեն Russian English

## Գիտական հետազոտություններ

- Կենսաէներգետիկա, Կենսաքիմիա, Մանրեաբանություն, Կենսատեխնոլոգիա

## Պետական մրցանակներ և պատվավոր կոչումներ

2016 Ամերիկյան Մանրեաբանական ընկերության (ASM) Մորրիսոն Ռոգոսայի (Morrison Rogosa)

2019 ԵՊՀ 100-ամյակի կապակցությամբ արծաթե մեդալ

## Հրապարակումներ

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### 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

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

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

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**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

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**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

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**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

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**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

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**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

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**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

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**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

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**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

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**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

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**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

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**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 Bagdasaryan, Armen Trchounian

International Journal of Hydrogen Energy 2018 15870-15879

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**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

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**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

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**NEW APPROACHES TO ENHANCE HYDROGEN PRODUCTION FROM GLYCEROL BY ESCHERICHIA COLI**

A. Poladyan

Հայաստանի կենսաբանական հանդես 2017 153-159

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**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

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**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

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Հոդված

**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

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**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

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**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

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Հոդված

**Համակարգչային տեխնոլոգիաների կիրառման առավելությունները և փորձը բուհական կենսաբանության դասավանդման ընթացքում**

L.U. Գաբրիելյան, Ա.Ա. Փոլայյան, Ա.Հ. Թոշովյան

Բնագիտ 2014 139-141

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

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

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Հոդված

**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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**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

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2013 153-163

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**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

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Գիտաժողովի նյութ

**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

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Գիտաժողովի նյութ

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

A. Poladyan, K. Trchounian, A. Trchounian

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**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

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

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

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**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

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**Optimization Strategy for Hydrogen Production by Escherichia coli Using Brewery Waste**

A. Poladyan, K. Trchounian, A. Trchounian

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

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

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

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

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ՄԹԹՈՂԱԲԱՆԱԿԱՆ ՄՈՏԵՑՈՒՄՆԵՐԸ ԵՐԵՎԱՆԻ ՊԵՏԱԿԱՆ ՀԱՍՏԱՏՈՎՐԱՆՈՒՄ**

Թոշունյան Կ.Ա., Գաբրիելյան Լ.Ս., Փոլադյան Ա.Ա., Թօջունյան Ա.Հ.

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

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

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

A. Poladyan, R. Hayrapetyan, A. Trchounian

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

Anna Poladyan, Lusine Baghdasaryan, Karen Trchounian, Armen Trchounian

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**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

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**From organic waste to biohydrogen: Approaches to enhance H<sub>2</sub> production by Escherichia coli**

Anna Poladyan, Karen Trchounian, Armen Trchounian

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**Анализ использования гидрогеназ Escherichia coli в качестве анодных ферментов**

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

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

Anna Poladyan, Karen Trchounina, Armen Trchounian

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**Hydrogenase Activity of the Facultative Chemolithoautotroph *Ralstonia eutropha* Consuming Brewery Waste**

A. Poladyan, O. Lenz, A. Trchounian

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***Ralstonia eutropha* Hydrogenase Application in Bioelectrocatalysis as Anode Enzyme**

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

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

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

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**Upcycling of office waste paper and cardbord to biohydrogen**

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

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**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

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

Anna Poladyan, Syuzanna Blbulyan, Mayramik Sahakyan, Armen Trchounian

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

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

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

S.Blbulyan, A. Poladyan, A. Trchounian

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**Prospective Trends in Biotechnology for Biohydrogen**

Karen Trchounian, Anna Poladyan, Lilit Gabrielyan, Armen Trchounian

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**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.

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**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

**Գիտաժողովի նյութ**

**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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**Գիտաժողովի նյութ**

**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

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**Գիտաժողովի նյութ**

**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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**Գիտաժողովի նյութ**

**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

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**Գիտաժողովի նյութ**

**ՕՐԳԱՆԱԿԱՆ ԹԱՓՈԽՆԵՐԻՑ ԿԵՆՍԱՉԱՆԳՎԱՅԻ ԵՎ ԿԵՆՍԱԵԼԵՐԳԻԱՅԻ ՓՈԽԱԿԵՐՊՄԱՆ**

**ԿԵՆՍԱՔԵՐՄԱԿԱՆ ՈՒՂԻՆԵՐԻ ԲՆՈՒԹՅԱԳՐՈՒՄԸ ԵՎ ՕԶՈՒԴԱՎԵՐԱԿԱՆԳՈՂԱԿԱՆ ԿԱՐԳՎԱՌՈՐՈՒՄԸ**  
Փոլանյան Ա.Ա., Գևորգյան Հ.Խ., Վանյան Լ.Մ., Բաբայան Ա.Ռ., Բաղդասարյան Լ.Հ., Վասիլյան Ա.Վ.,

Պետրոսյան Հ.Հ.

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**Գիտաժողովի նյութ**

**THE OXIDATIVE STRESS AND POSSIBLE PREVENTIVE ACTION OF PLANT BORN POLYPHENOLS**

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

Naira Sahakyan

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

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

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**Գիտաժողովի նյութ**

**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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**Գիտաժողովի նյութ**

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

Meri Iskandaryan, Liana Mnatsakanyan, Anna Poladyan

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**Գիտաժողովի նյութ**

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

Sona Nikolyan, Armine Margaryan, Anna Poladyan

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**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

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Գիտաժողովի նյութ

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

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

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Գիտաժողովի նյութ

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

Liana Vanyan, Anait Vassilian, Anna Poladyan, Karen Trchounian

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Գիտաժողովի նյութ

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

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

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Գիտաժողովի նյութ

**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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