



Cooperation of COMSATS with the Faculty of Biology and Biotechnology of AL-FARABI KAZAKH NATIONAL UNIVERSITY

Candidate of biological sciences,
Gaukhar Datkhabayeva
AL-FARABI KAZAKH NATIONAL UNIVERSITY

Al-Farabi Kazakh National University

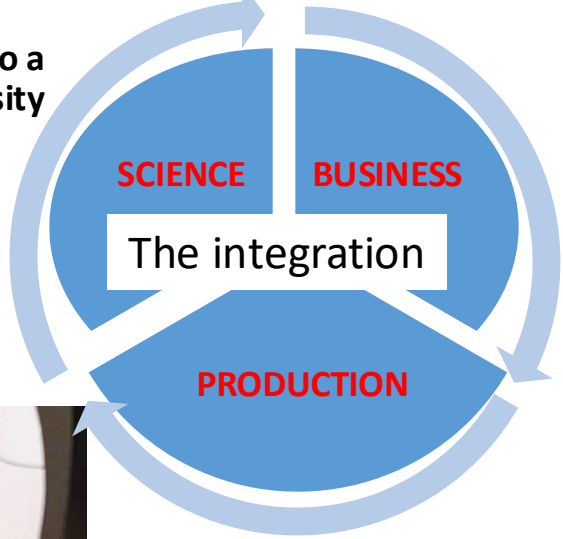


**MULTIDISCIPLINARY
UNIVERSITY**

2020

transformation into a
research university

2025



**WORLD
UNIVERSITY
RANKINGS**

**Top-
163**



Award in the nomination «Societal Impact of Research: Medical Sciences and Agricultural Sciences». 2023



«АККРЕДИТЕУ ЖӘНЕ РЕЙТИНГТІҢ ТӘУЕЛСІЗ АГЕНТТІГІ» КЕМ
НУ «НЕЗАВИСИМОЕ АГЕНТСТВО АККРЕДИТАЦИИ И РЕЙТИНГА»
INDEPENDENT AGENCY FOR ACCREDITATION AND RATING





FACULTY OF BIOLOGY AND BIOTECHNOLOGY

Departments:

- Biotechnology;
- Biophysics, Biomedicine and Neuroscience;
- Molecular Biology and Genetics;
- Biodiversity and bioresources.

Agrobiotechnological Center

Museum

Vivarium

Greenhouse

Research institutes:

- Research Institute of Issues in Biology and Biotechnology
- Research Institute of Issues in Ecology

Research laboratories:

- Laboratory of Microbiology
- Laboratory of Biotechnology
- **Laboratory of Photobiotechnology**
- Laboratory of Plant Biotechnology
- Laboratory of Biochemistry
- Laboratory of Bionanotechnology
- Laboratory of Molecular Ecophysiology
- Laboratory of Environmental Monitoring and Expertise
- Laboratory of Ecotoxicology
- Laboratory of Molecular Genetics
- Laboratory of Human and Animal Physiology
- Laboratory of Aquaculture
- Laboratory of Zoology
- Laboratory of Comparative Plant Anatomy

Research projects on grant financing

32

Post-doctoral projects

5

Projects of young scientists

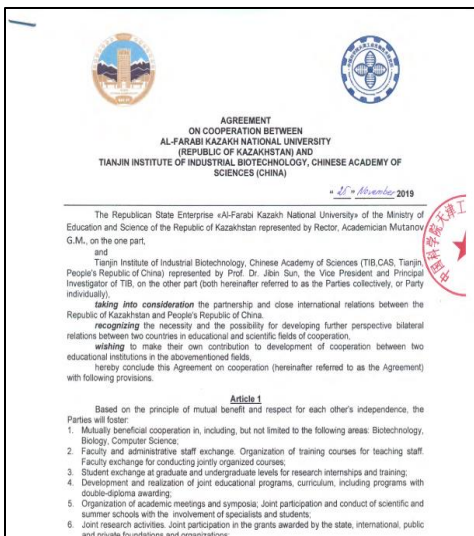
5

The amount of financing for 2022 –
\$ 1 084 285,33



Cooperation Agreement between KazNU and TIB (October 2019)

Agreement on accession of KazNU in Alliance (April 2021)



J. Huang - head of the joint research and development group for Bio-Agriculture

B.K. Zayadan - Member of the Advisory Committee of the Joint Center for Industrial Biotechnology COMSATS

A.K. Sadvakassova - Member of the Technical Committee of the Joint Center for Industrial Biotechnology COMSATS



Kossalbayev B.



Bauyenova M.



Sarsekeeva F.K.



Zaletova D.



Lyaguta M.

Joint exploration

Academic exchange

Agriculture
Bioremediation
Bioenergetics

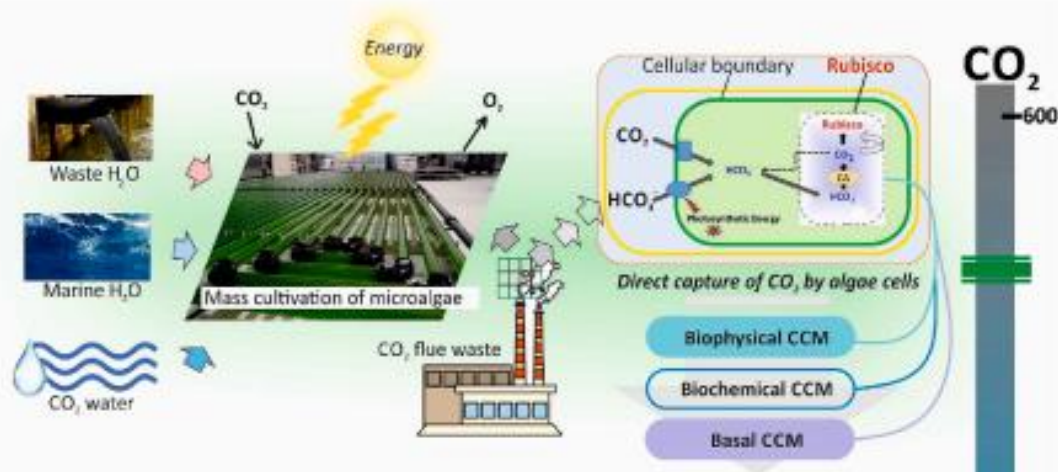
Participation in the conference, internship schools
Seminars

Our young Scientists Receive Financial Support from TianJing SynBio Program for Research of new synthetic biological products increasing crop yields and productivity

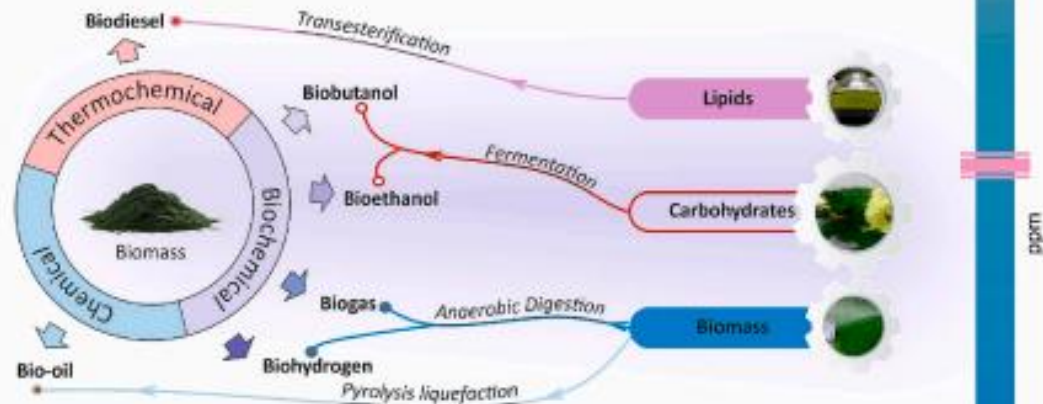
Our young Scientist PhD Doctor and Master's students on a scientific internship at TIB

Belt & Road scholarships

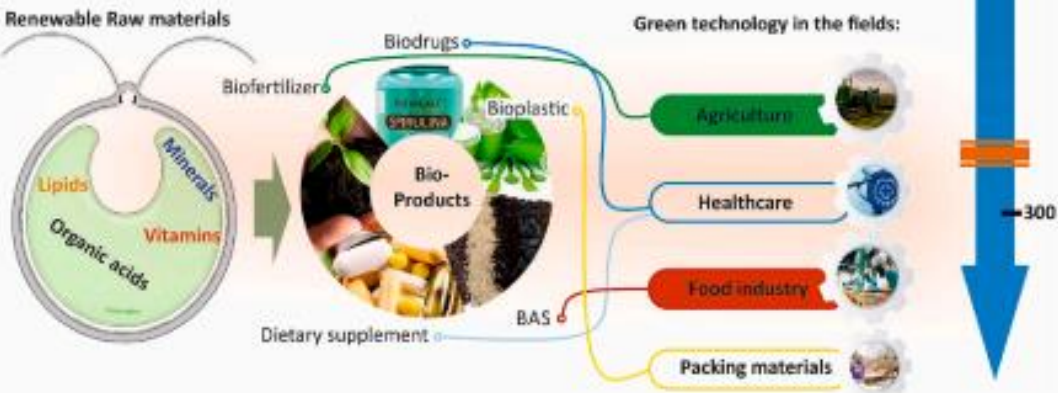
Sequestration and utilization of CO₂



Alternative energy



Compensation projects



Key strategies and potential use of microalgae

Algae can represent a hightech, low-cost and environmentally friendly solution to many of the current needs of society, while achieving carbon neutrality and thus contributing to the creation and development of a bioeconomy based on algae.



Microalgae as a key tool in achieving carbon neutrality for bioproduct production

Assemgul K. Sadvakasova^a, Bekzhan D. Kossalbayev^{a,b}, Meruyert O. Bauenova^a, Huma Balouch^a, Yoong Kit Leong^{c,d}, Bolatkhan K. Zayadan^a, Zhiyong Huang^{e,f}, Hesham F. Alharby^g, Tatsuya Tomo^h, Jo-Shu Chang^{c,d,i,j,*}, Suleyman I. Allakhverdiev^{k,l,m,**}

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- ^b Department of Chemical and Biochemical Engineering, Institute of Geology and Oil-Gas Business Institute Named after K. Turyssov, Satbayev University, Almaty 050043, Kazakhstan
- ^c Department of Chemical and Materials Engineering, Tunghai University, Taichung 407, Taiwan
- ^d Research Center for Smart Sustainable Circular Economy, Tunghai University, Taichung 407, Taiwan
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- ^g Department of Biological Sciences, Faculty of Science, King Abdulaziz University, Jeddah 21589, Saudi Arabia
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- ^k K.A. Timiryazev Institute of Plant Physiology, Russian Academy of Sciences, Botanicheskaya Street 35, Moscow 127276, Russian Federation
- ^l Department of Chemistry, Faculty of Science, King Abdulaziz University, Jeddah 21589, Saudi Arabia
- ^m Department of Chemistry, Faculty of Science, King Abdulaziz University, Jeddah 21589, Saudi Arabia



Search for new strains of microalgae-producers of lipids from natural sources for biodiesel production

Asemgul K. Sadvakasova^a, Nurziya R. Akmukhanova^a, Kenzhegul Bolatkhan^a, Bolatkhan K. Zayadan^a, Aizhan A. Ussebayeva^a, Meruert O. Bauenova^a, Akbota E. Akhmetkaliyeva^a, Suleyman I. Allakhverdiev^{b,c,d,e,f,g,h,i,j,k,l,m,n,*}

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Abstract

Biomass of high-yielding strains of phototrophic microorganisms actively accumulating lipids is a promising non-traditional raw material for **bioenergy** including the production of biodiesel. In this study, we present results of searching for new strains of microalgae-

SPRINGER LINK

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Review | Published: 19 July 2021

Potential of cyanobacteria in the conversion of wastewater to biofuels

Asemgul K. Sadvakasova^a, Bekzhan D. Kossalbayev^a, Bolatkhan K. Zayadan^a, Dariga K. Kirbayeva^a, Saleh Alwasel^b & Suleyman I. Allakhverdiev^{c,d}

World Journal of Microbiology and Biotechnology, 37, Article number: 140 (2021) | Cite this article

1523 Accesses | 17 Citations | 1 Altmetric | Metrics

Abstract

Environmental and energy security has now become a serious global problem, requiring a lot of research to find and implement its cost-effective and environmentally friendly alternatives



Potential of microalgae Parachlorella kessleri Bh-2 as bioremediation agent of heavy metals cadmium and chromium

Meruert O. Bauenova^a, Asemgul K. Sadvakasova^a, Zhuldyz O. Mustapayeva^a, Mikolaj Kokociński^b, Bolatkhan K. Zayadan^a, Maria Katarzyna Wojciechowicz^b, Huma Balouch^a, Nurziya R. Akmukhanova^a, Saleh Alwasel^c, Suleyman I. Allakhverdiev^{a,c,d,*}

- ^a Al-Farabi Kazakh National University, Almaty 050040, Kazakhstan
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ARTICLE INFO

Keywords: Heavy metals, Microalgae

ABSTRACT

The basis of biological remediation basically refers to environmentally friendly methods of extracting various xenobiotics, including heavy metals, from the wastewater of various industrial facilities, using the biochemical capabilities of naturally occurring organisms or their metabolites. In this regard, the assessment of the contri-



Faculty of Biology and Biotechnology has very good history of Collaboration with COMSATS

- **2021**

- The Faculty of Biology and Biotechnology of Al-Farabi KazNU joined the Alliance of Biotechnology Industry (talents), and is a member of the Joint Center for Industrial Biotechnology (CCIB) COMSATS, April 14, 2021 .

<https://www.kaznu.kz/en/26987/news/one/38376/#:~:text=The%20Faculty%20of%20Biology%20and,this%20visit%2C%20the%20Chief%20Coordinator>

- **2022**

- Prof. Sadvakassova A.K. participated as an invited speaker at the online seminar “Crop Microbiome and Sustainable Agriculture” for researchers from 27 COMSATS member countries, April 13, 2022 with a report on the topic “ Biotechnological potential of soil cyanobacteria in agriculture ”.

- <https://comsats.org/ccibs-workshop-highlights-significance-of-crop-microbiome-for-sustainable-agriculture/>



- **2023**

- Scientists from the Faculty of Biology and Biotechnology participated in the “International Forum on Innovation and Development of Bioindustry ” organized from November 9 to 10, 2023 in Tianjin (China , Tianjin) by the Tianjin Institute of Industrial Biotechnology (TIB) CAS), Chinese Academy of Sciences (CAS), National Innovation Center for Synthetic Biotechnology, Belt and Road Alliance of International Science Organizations (ANSO) and the Southern Committee for Sustainable Science and Technology (COMSATS).

- <https://farabi.university/news/86962>



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- ***COMSATS Joint Centre for Industrial Biotechnology (CCIB) workshop creates a platform to share advancements in research relating to crop microbiome and to discuss its importance in bringing sustainability in agriculture sector.***





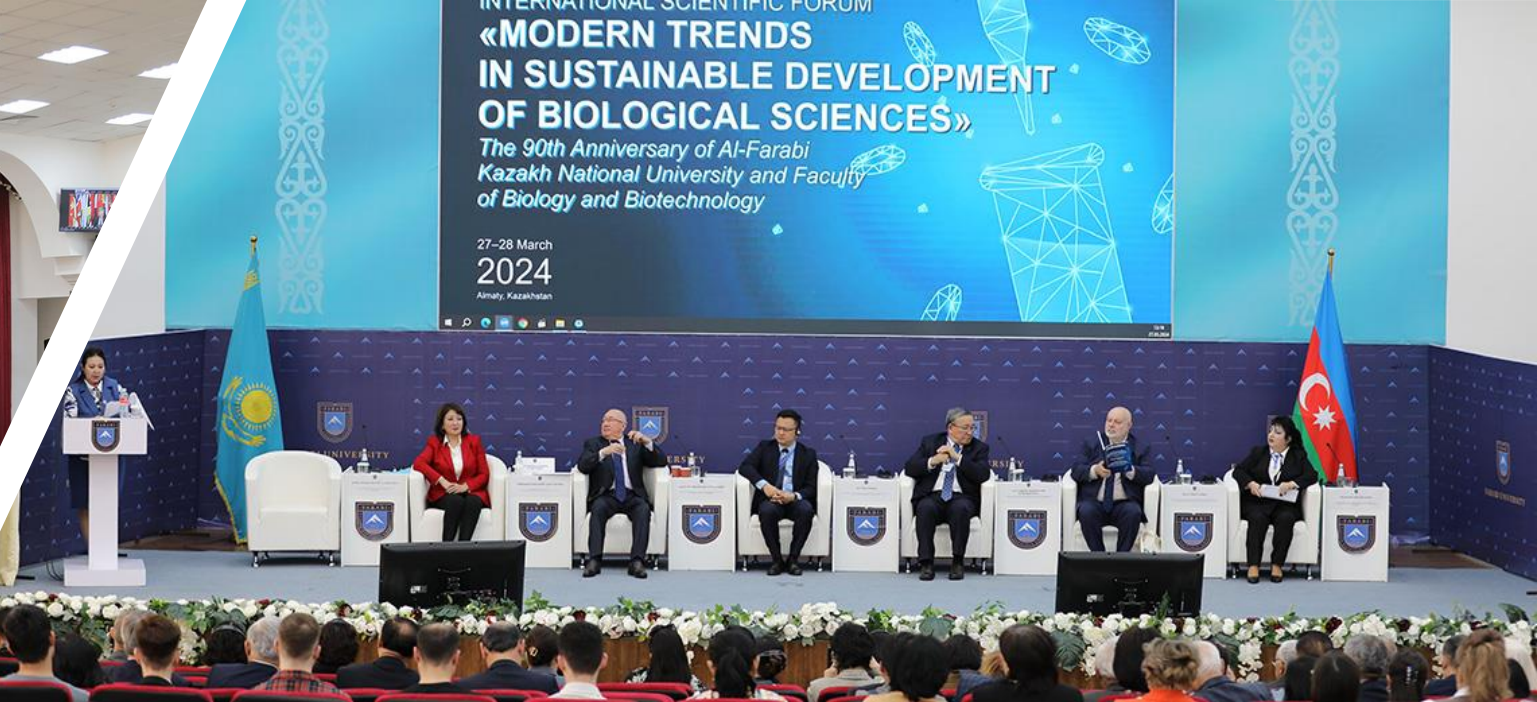
- 2024

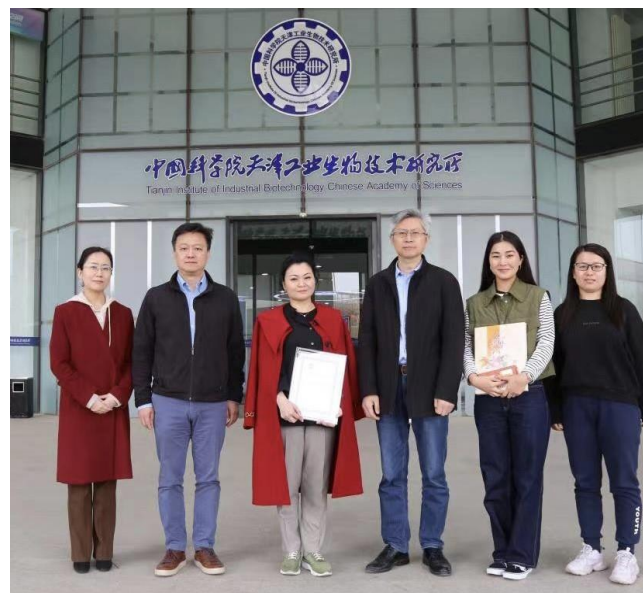
- On March 27-28, 2024, the Faculty of Biology and Biotechnology organized and held the International Forum “Modern Trends in Sustainable Development of Biological Sciences” in a hybrid format (online and offline) at the Al-Farabi Kazakh National University , indexed in the Scopus bibliographic database .

- The Commission on Science and Technology for Sustainable Development in the South (COMSATS), along with the Committee on Scientific and Technical Cooperation of the OIC (Organization of Islamic Cooperation) COMSTECH and the Institute of Dendrology of the Ministry of Science and Education of the Republic of Azerbaijan , provided sponsorship and participated in the organization of this forum.

- **We are very grateful for COMSATS for financial support. COMSATS funded participation of several foreign researchers and gave us very powerful support from many other perspectives.**







Tianjin, China, 2023





Almaty, Kazakhstan, 2023



- Joint implementation of scientific projects within the framework of interstate target programs allows us to deepen and expand our interaction, as well as implement mutually beneficial projects in the field of high technologies and obtain greater results and opportunities for their implementation in the field of high technologies.



技术分论坛五、天然产物生物制造
TECHNICAL FORUM V: BIOMANUFACTURING OF NATURAL PRODUCTS

圆桌讨论/PANEL DISCUSSION

<p>主持人: 刘涛 Host: Tao Liu 中国科学院天津工业生物 技术研究所研究员 Professor of Tianjin Institute of Industrial Biotechnology, Chinese Academy of Sciences</p>	<p>黄婷婷 Tingting Huang 上海交通大学生命科学 技术学院副研究员 Associate Professor, Shanghai Jiao Tong University of the Life Sciences and Biotechnology</p>	<p>Jenis Janar 哈萨克斯坦国立大学药用 植物研究中心主任、教授 Director and Professor of the Research Center for Medicinal Plants of Al-Farabi Kazakh National University</p>	<p>Maliheh Safavi 伊朗科学技术研究组织 生物技术部主任、副教授 Director of Biotechnology Department, Iranian Research Organization for Science and Technology</p>	<p>Sadvakassova Assemgul 哈萨克斯坦国立大学生物与 生物技术学院副院长 Vice Dean Faculty of Biology and Biotechnology at Al-Farabi Kazakh National University</p>	<p>王勇 Yong Wang 中国科学院合成生物学实验室副主任、 中国科学院分子植物科学卓越创新中心 中国科学院上海植物生理生态研究所研究员 Professor of Key Laboratory of Synthetic Biology, CAS, CAS Center for Excellence in Molecular Plant Science (CEMPS), Institute of Plant Physiology and Ecology, Chinese Academy of Sciences</p>

Thank you for your attention



Kazakhstan, Almaty