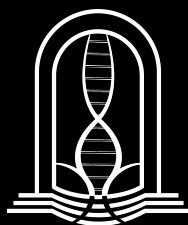


BIOGATE 2024

GENERAL GUIDELINE

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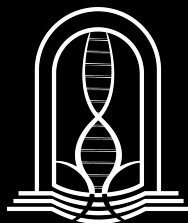
GENERAL INFORMATION

- **What is BioGate?**

Galen Team, consisting of Istanbul Technical University (ITU) students, organized the International BioGate Biotechnology and Life Sciences Competition for the first time in 2023. The competition, held every year at ITU Süleyman Demirel Cultural Center, aims to contribute to the developments in the field by bringing together expert scientists, leading companies, and university students. With its unique categories, BioGate highlights areas that deserve special attention, such as Pandemic, Bioengineering, Ecology, Synthetic Biology and Genetics.

- **What is the Galen Team?**

Galen Team is a student community consisting mostly of Istanbul Technical University students, producing innovative projects in the fields of biotechnology, life sciences, ecology, and geology. This student group actively participates in international competitions and conferences with its projects. As a team, they have made a significant contribution to the future by organizing the BioGate Competition for the first time in 2023, demonstrating their commitment to promoting advances in various scientific fields.



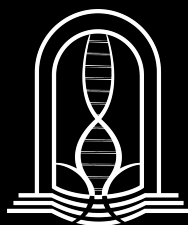
- **What are Biotechnology and Life Sciences?**

Biotechnology and life sciences are interdisciplinary fields that explore and utilize biological systems, organisms, and their derivatives to develop technological applications and solutions. These fields play a crucial role in understanding, manipulating, and improving living organisms for various purposes.

Biotechnology involves the use of living organisms, cells, and biological systems to develop innovative products and technologies. It covers a wide range of applications, including genetics, agriculture, medicine, and industrial processes.

Life sciences are the study of living organisms and their interactions with each other and the environment. It includes various subdisciplines such as biology, biochemistry, genetics, ecology, and more. Life sciences are fundamental to understanding the complexities of life and its underlying mechanisms.

Biotechnology and life sciences are also expected to play an important role in solving global challenges such as climate change and resource depletion in the future. Advances in genomics, proteomics, and bioinformatics are



providing unprecedented insights into the complexities of living organisms. The integration of artificial intelligence (AI) and machine learning is improving our ability to analyze large biological data sets. Life sciences and technology are expected to contribute significantly to personalized medicine and the knowledge of complex biological systems.

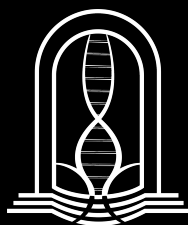
- **What is our purpose?**

BioGate is designed to support future leaders and innovative projects in the field of biotechnology and life sciences. Through BioGate, the Galen Team aims to bring together potential talents in the industry and encourage innovative ideas.

Every year, the competition provides a platform for young scientists and entrepreneurs, aiming to increase collaborations in the sector, encourage the emergence of new projects, and support advances in biotechnology and life sciences. BioGate strives to contribute to innovation in the industry by providing participants with valuable experiences and networking opportunities.

- **Registration**

When registration for the BioGate competition opens, you must fill out the application form on the website to apply.

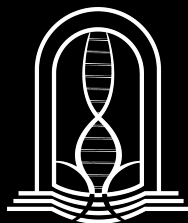


The link to the website is <https://biogate.itu.edu.tr/>. We are excited to see you at the International BioGate Competition 2024.

- **Participation Fee**

BioGate's participation fee for all teams is **250 Euros**. The deadline for payment of the competition participation fee is **August 20**. However, the participation fee for the early registration period **until July 15 is 200 Euros**. The early registration fee must be paid by **July 30** at the latest. Otherwise, only non-discounted price payments will be valid. Bank account information will be sent to registered teams via e-mail. Teams that want to participate in the competition with more than one category must pay the registration fee for each category they wish to participate in.

The BioGate competition does not include a personal participation fee. Please note that teams participating from outside Istanbul must provide their own accommodation. Depending on the team's wishes, it is possible to reserve a place at the ITU Yilmaz Akdoruk Guesthouse during the early registration period, if space is still available. However, the accommodation fee is entirely the responsibility of the team members; the fee must be paid in advance to make a reservation. The team with such a request must submit its request via e-mail. However, it completely depends on the team's preference and there is no obligation.



GENERAL RULES AND CRITERIA:

All projects participating in BioGate must comply with the criteria specified here.

Problem Identification:

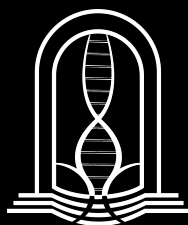
- Clarity in identifying a specific related problem: Clearly articulate and define the specific issue the project aims to address. State the question accurately.
- Demonstrating the impact of the problem on society: Highlight the wider social consequences of the identified problem. Explain what the social consequences of addressing this issue would be.

Scientificity:

- Prove the scientific soundness of the project: Explain the scientific validity and reliability of the proposed solution. Make sure the project is based on sound scientific principles.
- Evaluate your project for innovation and originality: Measure the level of creativity and uniqueness in the project. Consider whether the proposed solution offers a new perspective or approach. Examine whether the project introduces new methods or ideas that distinguish it from existing solutions in the literature.

United Nations Sustainable Development Goals:

- Evaluate the project's relationship with relevant Sustainable Development Goals (SDGs) to demonstrate



its alignment with global priorities.

Interdisciplinary approach:

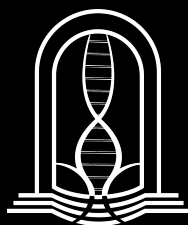
- Integrate multiple disciplines into your project: Evaluate how effectively the project integrates knowledge and methodologies from various fields such as biology, engineering, and computer science.
- Show how the project brings together various aspects of biotechnology: Highlight the relationship between different aspects and tools of biotechnology within the project.

Feasibility:

- Evaluate the feasibility of implementing the proposed solution in real-world scenarios: Evaluate the practical feasibility and potential barriers to implementing the proposed solution.
- Consider the feasibility of the project in terms of scalability: Examine whether the project is scalable to address larger-scale challenges.

Ethical Considerations:

- Consider potential risks and benefits: Evaluate the ethical implications of the project by weighing potential risks against benefits.
- Evaluate the ethical implications of the project: Evaluate ethical considerations in bioengineering and synthetic biology and recommend strategies to address them. Ensure accessibility and equity in the proposed solution.



- Ensure compliance with the Universal Declaration on Bioethics and Human Rights: Demonstrate how the project complies with established ethical guidelines.

Originality and Sources:

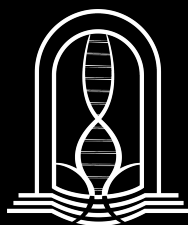
- Show off your unique ideas and approaches to the project. Make sure that all sources you use are properly cited. Make sure that direct quotes, paraphrased content, and other people's ideas are properly cited. Be sure to avoid plagiarism. Teams will also be disqualified if they falsify or plagiarize data.

Biosafety:

- In the experimental categories, biosafety rules must be considered. Teams will be disqualified if they do not follow the biosafety and biosecurity guidelines given by the World Health Organization (Laboratory biosafety manual, 4th edition) unless an exemption has been granted before the competition date.

Collaboration and Teamwork:

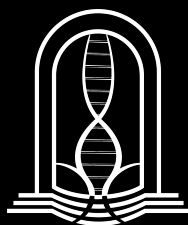
- Teamwork: Although BioGate does not require the formation of a team, it recommends teamwork.
- Evidence of interdisciplinary collaboration and team synergy: Demonstrate examples of effective collaboration between team members from different backgrounds.
- Use of diverse expertise: Emphasize how knowledge collaboration in microbiology, genetics, bioengineering,



ecology, and synthetic biology is effectively used within the team.

Representing the project on Social Media:

Make sure you have a dedicated team account for BioGate on a social media platform to promote your team and spread the word about your project, and be sure to share **at least 4 posts** with the hashtag **#thegateofthefuture** by the report deadline. If you are participating personally, open a new account for your new BioGate project.



EVALUATION

Project Reports:

- Preliminary Report

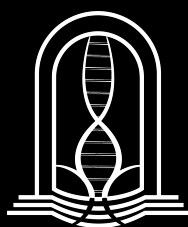
All teams are required to submit a preliminary report after registering for the competition. This report aims to assess the general project topic and to gather general information about the team members, team advisor, etc... The format of the report will be sent.

- Final Report

Evaluation of projects will mostly be done through the final project report. Since the format of the project report will differ in each category, please review the project report section in each category in this booklet and be aware of the announcements. The format of the report will be sent.

Poster Presentation and Q&A Session

Teams will present their projects to the juries in a short poster presentation session on the days of the BioGate Competition. This session aims to clarify the main reasons why teams selected their projects and how these projects contribute to science and life, to explain the basic details of the project, try to demonstrate their projects with the presentation, and answer the questions jury members will ask after the presentation. Teams must anticipate potential questions and be prepared to answer them effectively.

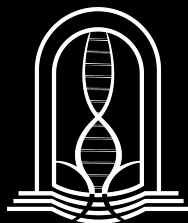


TIMELINE

Early Registration	March 15 - June 15
Early Competition Fee Payment	June 30, 11.59 pm (+3)
Registration	June 15 - August 18
Competition Fee Payments Deadline	August 20, 11.59 pm (+3)
Preliminary Report	August 25, 11.59 pm (+3)
Final Report	September 25, 11.59 pm (+3)
BioGate Days	October 26-27

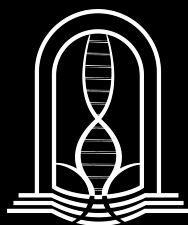
CATEGORIES

- Artificial Pandemic
- Ecological Balance
- Bioengineering
- Synthetic Biology and Genetics



ARTIFICIAL PANDEMIC:

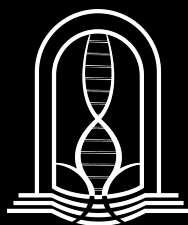
The artificial pandemic category provides an opportunity for participants to develop and collaborate on innovative solutions to protect global health. With the growing concerns of outbreaks, this initiative aims to provide creative solutions in various areas such as diagnosis, treatment and prevention. With participants moving away from traditional approaches to solve problems, it is expected to use interdisciplinary approaches and new strategies. Emphasizing the importance of awareness and preparedness, this category aims to embrace preparedness for epidemic disasters. By promoting innovation in diagnosis, treatment and prevention, participants can contribute to the development of robust global health systems capable of mitigating the impact of unforeseen threats. Collaboration and shared knowledge are important components of this effort, because participants work together to protect the health of communities all over the world. By addressing the artificial pandemic scenario, contestants envision a healthy and safe future for stronger and more resilient global health systems. We encourage contestants to make a significant contribution in safeguarding the well-being of communities worldwide.



BIOENGINEERING:

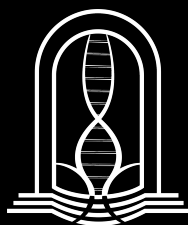
This is the category where biology and medicine meet with engineering. It develops sustainable solutions by blending biology and engineering, paving the way for a healthier future. Can you imagine a world where biosensors integrated into wearable devices continuously monitor vital diseases, a world where bioengineered skin grafts revolutionize wound healing, offering faster recovery times, or even a world where a medical device is capable of diagnosing all medical conditions and capturing vital signs without the need for a healthcare professional's intervention? More like a science-fiction and new Star Trek, huh? Well, no! - This category is the place where science fiction turns to reality. Remember: the only limitation is creativity!

In this category, we expect projects on many exciting themes, such as biomechanics, biomaterials, biological signal processing, biosensors, imaging, etc. Although the projects are not limited to the topics mentioned here, all we want is for the general theme to be the merging of biology with engineering. Teamwork is highly appreciated. Your projects can be laboratory-scale experimental studies or theoretical/proposal studies.



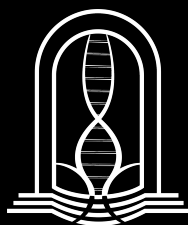
ECOLOGICAL BALANCE:

Ecological Balance, the new stage of the Biogate Competition, deals with the changes that a supervolcanic eruption will cause on our world in a multi-dimensional way as its main subject. Volcanism is a natural phenomenon that can directly cause some changes in ecosystem, geology, climate, weather and many other events, depending on a magnitude of the eruption. At this stage, how a major volcanic eruption in the Indonesian region will be affected especially for life, should be considered and discussed depending on scientific data. Moreover, how to geological structures in the region changed chemically after the explosion occurred and which structures could replace the structures that form before the eruption should be discussed based on scientific data.



SYNTHETIC BIOLOGY AND GENETICS:

Synthetic biology is a rapidly evolving field that integrates principles from biology, genetics, and engineering to design and construct novel biological systems with desired functionalities. Genetics, the study of heredity and variation in living organisms, serves as a fundamental discipline in modern biology. Computational methods, from gene editing to transportation optimization, are essential for modeling, simulating, and predicting intricate biological processes that accelerate scientific discoveries. In this category, participants are challenged to harness the power of synthetic biology and genetics alongside computational methods to solve real-world problems, pushing the boundaries of what is possible in biotechnology and beyond. Collaboration with Zymvol, a company devoted to improving the sustainability and efficiency of biocatalysts, will be established for the enzyme technology projects in synthetic biology and computational biology. Participants in this collaboration will be provided with a case scenario, wherein they will be expected to introduce mutations to the biocatalyst.



CONFERENCE:

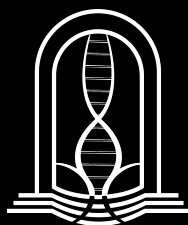
We are pleased to announce that with our competition, there will also be Conference during the competition dates.

This event is an opportunity for all participants to enhance their knowledge about the topics that include competition categories: bioengineering, ecology, pandemic, synthetic biology and genetics. We will bring together the researchers and experts from their fields to share their experiences and ideas to discuss the new perspectives with all participants.

This conference that will take place during the BioGate competition will be held at the Istanbul Technical University Suleyman Demirel Culture Center (SDKM) on 26-27 August. Invited speakers and the schedule of the conference will be announced on the website and all other social platforms, stay updated for the announcements.

FAIRGROUND:

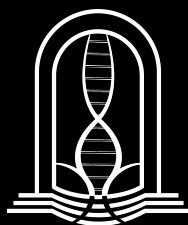
During the BioGate competition and Conference all the participants will also have the chance to meet companies and organizations related to Biotechnology and get information from them at the fairground which will be placed in Istanbul Technical University Suleyman Demirel



BIOGATE

Culture Center (SDKM). Teams can present their posters in the fairground to share their revolutionary ideas with participants, professors, and companies.

Details will be announced, please stay updated!



FAQ:

1. How many people can teams include?

The team can include a minimum of 5 and a maximum of 15 people.

2. Can a team join the competition without an advisor?

It is obligatory for teams that have an experimental project to have an advisor. It is not mandatory to have an advisor for non-experimental categories yet, we recommend teams have an advisor regardless, as it can be beneficial for teams.

For the high school teams, which have non-experimental projects, the presence of an advisor is compulsory.

3. How much is the participation fee?

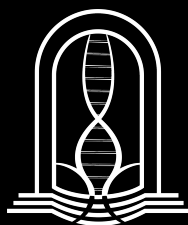
The participation fee is 250€ for all teams. The deadline for payment of the competition participation fee is August 20th.

4. How can we pay the participation fee?

After the registration form is submitted, participation fees or final registrations will be deposited into the bank accounts that will be sent to the teams via e-mail.

5. Can university/college graduates participate?

Yes, graduate students can apply to BioGate.



6. Is there an age limit for BioGate participants?

No, there is no age limit to participate in BioGate.

7. How will I know that our team is registered after completing the application on the website?

Our team will send you an informative e-mail for registration confirmation.

8. Can a person attend the conference without participating in the competition part?

Yes, individuals can attend the conference without being part of a competitive team. Detailed information will be announced.

