



## BIOTE(A)CH

### Bridging the Gap Between Biotechnology and Industry: Integrating Design Thinking and Flipped Learning

Welcome to the first e-newsletter of the BIOTE(A)CH project carried out by a consortium of 5 Universities, a Bio-tech company and an Ed-Tech Enterprise.

The project started on January 2023 and has a duration of 2 years, including educational research and content development, transnational meetings, educational workshops, video tutorials, podcasts and other dissemination activities.

The main objective of the project is to bridge the gap between the University and the industry, through the validated and research-grounded understanding of the realities of biotechnology education within Europe.



TARGETS



PARTNERS



NEWS



Co-funded by  
the European Union

# OUR MAIN TARGETS



## Curriculum

BIOTE(A)CH will use design thinking in the Higher Education course curriculum. Design thinking is a new interdisciplinary approach that links activities in various fields to the industrial world. Universities have started to use this approach in their course delivery designs. It is a problem-solving approach that teams use to understand and redefine problems, challenge assumptions and create innovative solutions to prototype and test. Accordingly, it consists of 5 stages, namely empathize, define, ideate, prototype and test. In the Higher Education course curriculum, BIOTE(A)CH brings together "design thinking" and flipped learning" within the "biotechnology domain".



## Video Tutorials

Video tutorials will include two different types:

- 1- Explanations by experts (at most 5 minutes)
- 2- Animated videos (at most 5 minutes)

In this respect, the video presentations will address several academics who are involved in the biotechnology domain in an interdisciplinary way and increase the quality of teaching through flipped learning. Video tutorials will provide independent time for students, in order to be able to watch them when it is convenient, stop for breaks and repeat sections as needed, aiming at increasing engagement and participation and allowing maximized retention.



## Lecturer's Handbook

The Lecturer's guide will extend and develop the competencies of educators and experts in important supporting roles in key areas, focusing on mutagenesis, polyploidy, RNA interference, transgenics, and genome editing, in order to enable the scaling up of the benefits of this form of higher education. The success stories booklet will include the "story" of 10 European businesses in the field of Agro-Biotechnology and in specific 2 Turkish, 2 Italian, 2 Croatian, 2 Greek and 2 Slovenian stories to be an inspiration for students.



## Articles

Articles will include state-of-the-art reports on biotechnology and bio-economy. The information to be shared will cover how biotechnology serves environmental protection so far, providing eye-catching examples. They will cover the topics directly related to agricultural biotechnology, molecular biology, bio-catalysts, eco-remediation, fermentation technology and micro-technology applications, presenting the results of the partners' diversifying research work.



## PARTNERS



Çanakkale Onsekiz Mart University (COMU) founded in 1992, with its new status and intake from Turkey's large youth population, the University developed quickly in terms of the number of students, staff and facilities, spurring the opening of new faculties and colleges. The University has over 45,000 students, participating in a wide variety of programs taught by 1.000 academic staff in 10 faculties, 2 polytechnic colleges and 11 vocational colleges. COMU is one of the most competitive universities in Turkey, and always looking for more talented people plays a part in its future. COMU is a modern state University, committed to world-class academic excellence. The reputation and popularity of COMU in Turkey are based on the high-quality teaching and learning experience available to students at the University. At COMU, students work with well-qualified, intelligent, dedicated academic staff who encourage their self-development, in order to continue being successful after graduation. At our University, students have access to wide-ranging learning resources and up-to-date facilities.

The University of Maribor (UM) ([www.um.si](http://www.um.si)) is the second-largest and the second oldest University in Slovenia, where approximately 15,000 students study at 17 different faculties. UM, faculties offer diverse study programs, ranging from physical and life sciences, applied sciences and technology, social sciences and humanities, law and medicine. Faculties provide approximately 30 vocational programs, 50 undergraduate study programs, 70 Master's programs and 30 Doctoral programs. There are approximately 1,000 members of research and teaching staff and 700 members of supporting staff.

As the largest educational and research institution in Eastern Slovenia,

UM serves as a hub for new knowledge creation and its implementation in regional development. UM is listed among the 400 best universities in the world, according to Times World University Rankings.



ΔΗΜΟΚΡΙΤΕΙΟ  
ΠΑΝΕΠΙΣΤΗΜΙΟ  
ΘΡΑΚΗΣ

DEMOCRITUS  
UNIVERSITY  
OF THRACE

Democritus University of Thrace (DUTH) was established in 1973 in Thrace, Greece. Due to its strategic location, close to the EU members of Bulgaria and Romania, the candidate countries of North Macedonia, Montenegro, Serbia and Turkey, and at a major crossroads between EU, Asia and Russia, DUTH has a decisive role in promoting Education, Research and Development in the broader South Eastern Europe through a large number of regional networks it has established. Moreover, DUTH cooperates with several Universities and Research Organizations outside Europe, around the world, and its diverse educational and research activities have made it possible to possess a steadily improving position in the International University Rankings. Internationalisation is an inherent part of the DUTH Development Strategy, one of its major strategic priorities and a key factor not only for responding to challenges, changing needs and the rapidly evolving Education and Science frontiers, but also for enhancing the quality of education and research it provides; thus, DUTH constantly strives to maintain high-quality and mutually beneficial strategic partnerships and to establish novel collaborations, using all available ERASMUS+ tools. The Department of Molecular Biology & Genetics (MBG) of Democritus University of Thrace (DUTH) was established in 2000 in Alexandroupolis with the vision to become a Leader Institution in Education & Research. MBG is the only University Department in Greece dedicated to providing a curriculum in Molecular Biology & Genetics, two fast-growing scientific disciplines that lie in the heart of Innovation in Health, Food, Environment and Agriculture.

The University of Zagreb (1669) is the oldest and biggest university in South-Eastern Europe. As a comprehensive public Central European university, University of Zagreb offers education and research in all scientific fields (arts, biomedicine, biotechnology, engineering, humanities, natural sciences and social sciences) and a broad spectrum of courses at all study levels, from undergraduate to postgraduate. With 31 Faculties and 3 Art Academies, it is the flagship educational institution in Croatia, a place where more than 7900 teachers and approximately 70,000 students develop knowledge and acquire skills. The University excels not only in teaching, but also in research, contributing with over 50 percent to the annual research output in Croatia and 80 percent of scientific productivity of all Croatian universities. The contemporary Faculty of Chemical Engineering and Technology University of Zagreb (Faculty) has a long tradition in science and education since 1919, and has therefore greatly influenced the very emergence and development of modern chemical industry in Croatia and neighboring countries. The Faculty is especially proud of its teaching heritage where eminent scientists like Franjo Hanaman, a co-inventor of the tungsten filament for electric bulbs, and Vladimir Prelog, Nobel Prize winner, were part of staff. The core activities of the Faculty of Chemical Engineering and Technology are research, investigation, and high-level education in the fields of Chemical Engineering, Chemistry and Environmental Engineering.





Tuscia University (UNITUS) was established in 1979 and is now composed of six departments: Agriculture and Forest Sciences (DAFNE), Ecological and Biological Sciences (DEB), Economy, Engineering, Society and Business Organization (DEIM), Innovation in Biological, Agro-Food and Forest Systems (DIBAF), Languages and foreign modern literature (DISTU) and Humanities, Communication and Tourism (DISUCOM). Approximately 10,000 students are enrolled in over 40 undergraduate and graduate degree programs. The academic staff accounts for 1,800 team members.

UNITUS' main areas of expertise and knowledge lie in agriculture, science, engineering, economics, and humanities. The DAFNE is the only University Department in Lazio with teaching and research competencies in the fields of agriculture, forestry and natureconservation sciences, and agro-biotechnology. Teaching activities are closely tied to research and this connection becomes closer as the three-year degree programme progresses to the Master's level and reaches its maximum level in the research doctorate programmes. This is currently one of 120 Italian Departments of Excellence. In the next 5 years, this Department will receive extra funding that will be invested in a project aimed at further improving the quality of teaching and research.

Mellis Ed. Tech. is a newly founded enterprise. Mellis team has 5 people, but this number increases or decreases, according to the workload situation. The area of expertise of Mellis Ed. Tech. can be described as developing education and training programs and courses, according to the needs of companies and target groups, generally focusing on required skills. Mellis

Ed. Tech. develops interactive education courses that include participants in the learning process. Mellis Ed. Tech. carries out analysis studies such as gap, process, equipment and vocational analysis. These studies are conducted with several methods. Team members are experienced in ICT technologies, as well, such as "Interactive Software" and "Web-based software",

Glycogest Biotechnology Inc. is a biotech company using advanced molecular biology, microbiology techniques to develop human gut microbiota associated novel in vitro digestion system kits, production of therapeutic proteins in transgenic animals, high digestible animal feed, and low allergen-high digestible protein powders for human and animal health. The founder of the company, Mr. Karav has over ten years of work in this field, and the company combined his experiences. The company has expertise in all aspects of biotechnology systems, including different molecular biology, microbiology, computational biology, and bioinformatics techniques as listed; recombinant production and kinetic characterization of the gut microbiome associated novel enzymes, advanced mass spectrometry analysis of compounds, especially milk glycans and metabolites, prebiotic activity characterization of unknown compounds, enzyme immobilization, structural analysis of novel enzymes.





# NEWS

## ÇANAKALLE KICK-OFF MEETING

The kick-off meeting of the BIOTE(A)CH project took place at COMU University in Canakkale on 9 - 10 March 2023.

All project partners had two creative and productive days.

During the meeting, each partner resented their expertise, exchanged proposals and ideas with the aim of building and implementing the project in the best possible manner and suggested the ways to successfully lead to the project's goals.



## SITUATION ANALYSIS REPORT

One of the initial actions of the BIOTE(A)CH project was a survey with the aim to:

1. Identify the innovations and challenges in the bio-economy and agricultural biotechnology through the view of academia and private sector representatives.
2. Understand the current knowledge and skills the University students studying in biotechnology areas should have when they start their carrier.
3. Understand the difficulties University students studying in biotechnology areas will encounter in the industry when they start their carrier.
4. Contribute to the preparation of the curriculum for the undergraduate students in biotechnology areas as the first intellectual output.

The survey was duplicated on Google Forms, one for each partner country, and shared with academics and industry representatives working in the field of biotechnology who are part of the target group. The survey received 122 responses in total from Turkey, Greece, Slovenia, Italy and Croatia.

The results of the analysis combined with the upcoming results of the workshops to be held in each country will form the basis of the Higher Education curriculum.

