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610246-EPP-1-2019-1-TN-EPPKA2-CBHE-SP**



# Biotech Tunisia Newsletter

**Modernization of the biotechnology  
teaching for a better employability  
of Graduates in Tunisia**

**N°2**

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February  
2023- 2024**



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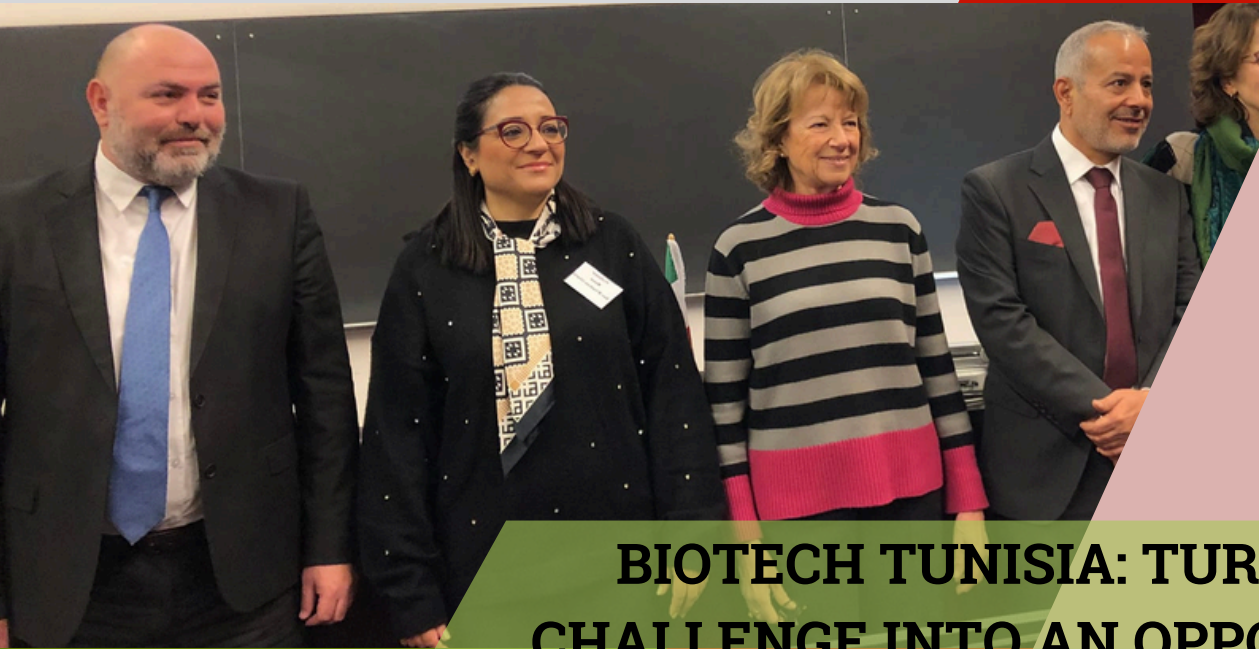


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## BIOTECH TUNISIA: TURNING A CHALLENGE INTO AN OPPORTUNITY

I was lucky enough to take part with the dynamic team of the Biotech Tunisia project on a benchmarking mission at the prestigious Molecular Biotechnology Center (MBC) at the University of Turin. Throughout the various elements of a carefully orchestrated program rich in opportunities for discussion, sharing, and networking, I was able to see the beginnings of turning a major challenge into a significant opportunity.

Historically, biotechnology has been a flagship of university education and research in Tunisia, but it took a hit due to the increase in student numbers within Tunisian universities, reaching its peak in 2010. New biotechnology training programs and institutions, like in many other fields, were established to handle a large influx of new students, even though the economic and societal demand was not there. The increased unemployment of young graduates, including PhD holders, and the mismatch between education and market needs worsened. Today, the situation has changed. The number of students has been steadily decreasing since 2011, allowing for better investment in a substantial reform that will impact both education and research in biotechnology, as well as societal openness.

### **Responsibility, ambition, and daring for an effective reform.**

It first took a sense of responsibility to recognize the extent of the challenge at hand and the need to address the structural obstacles hindering the proper valorization of Tunisian human capital in biotechnology. It also took ambition for the project's goals to have a national and strategic scope, and for the scope of activities to be holistic, including both training, research, and engagement with the environment. Now, it will take boldness in the implementation of the project and in ensuring the sustainability of its results: the training of a new generation of innovative, entrepreneurial biotechnology graduates, adapted to a rapidly changing global talent market, and simultaneously the development of an ecosystem that stimulates the creation of economic and societal value through biotechnology.

## Benchmarking, cross-fertilization, and internationalization

The Biotech Tunisia consortium offers a range of different and interesting experiences in Portugal, Finland, Italy, and Tunisia involving various key players: universities, research centers, companies, and government institutions. The exchanges between project partners are very useful for the future internationalization of biotechnology education in Tunisia and in the countries of the consortium, through the development of new opportunities for student and teacher exchanges, as well as the creation of joint training programs. The benefits of this internationalization are numerous, especially for students who:



will have access to cutting-edge technologies and top-notch expertise.



will be exposed to multicultural learning environments,



they will see their professional opportunities improve on an international scale.

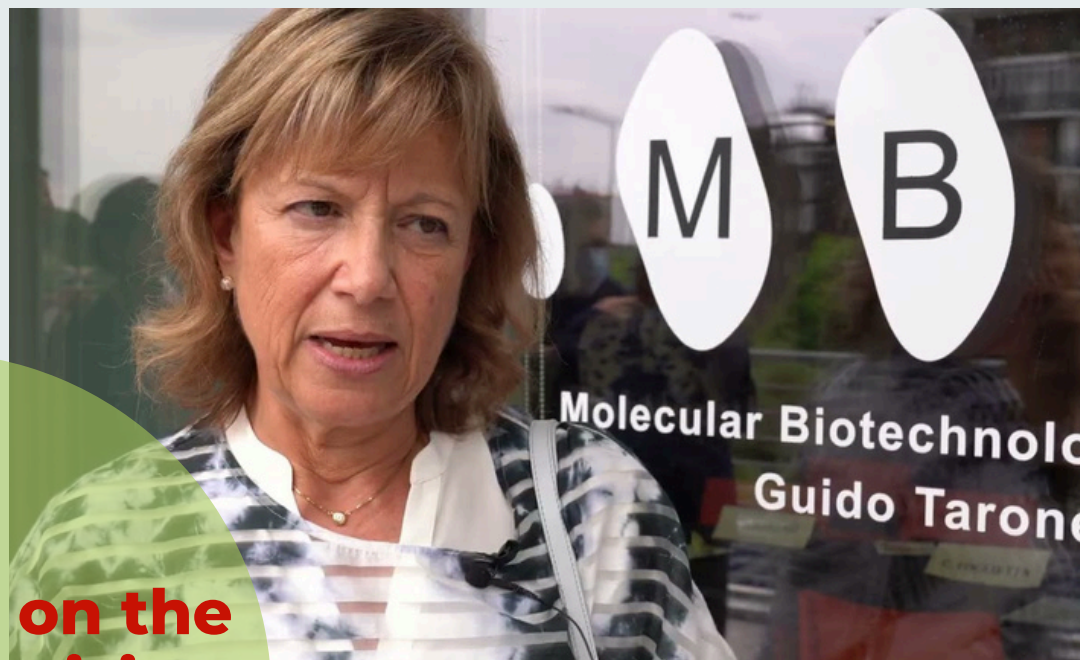
The internationalization of biotechnology training programs will also strengthen Tunisia's position as an excellent destination for international students, to meet a growing demand for training, especially in African countries.



## Erasmus+, a Tunisian success story

The dynamics of the Tunisian-European partnership and the close ties woven between Tunisian and European academic and scientific communities have made the Tunisian participation in Erasmus+ 2014-2021 remarkable. Over 14,000 mobilities and 92 capacity-building projects have been carried out, benefiting more than 1,100 Tunisian and European institutions. Erasmus+ has emerged as a popular program among Tunisian youth and a valuable tool for consolidating ongoing reforms. Tunisia aims to further improve its participation in the Erasmus+ 2021-2027 program in the field of education, higher education, and youth.

**MR MALEK KOCHLEF**  
**GENERAL DIRECTOR OF INTERNATIONAL COOPERATION**  
**MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH**



## **Reflections on the BiotechTunisia Project Meeting in Turin**

As I reflect on the recent meeting at the Molecular Biotechnology Center in Turin, I'm overwhelmed with gratitude for the experience and important insights shared by all participants. Over the meeting of five days, we engaged in meaningful discussions and collaborative efforts aimed at enhancing biotechnology training and employability for graduates in Tunisia within the framework of the Erasmus+ project "BiotechTunisia."

Throughout the meeting, I was deeply impressed by the dedication and commitment demonstrated by all participants towards our shared objective. From insightful presentations on innovative teaching approaches to a precise discussion on aligning academic programs with industry needs, each session offered new perspectives that will undoubtedly shape the future of biotechnology education in Tunisia and also in our institution.

Personally, I was impressed by the expertise of my Tunisian colleagues who represent excellence in many sectors such as agri-food.

I found the organizational problem-solving skills demonstrated by the delegates from the Ministry of Scientific Research and his ability to set up cooperation programs by Mr. Malek Kochlef (General Director of International Cooperation) to be very useful. I would like to extend my gratitude to all those who contributed to the success of this meeting, including the Rector of the University of Turin, Stefano Geuna and Professor Emanuela Tolosano, the current project coordinator.

A special thanks to Dr. Cornelia Di Gaetano for her dedication and competence in organizing the meeting. I am particularly grateful to Professor Manel Ben M'hadheb, to Professor Jawhar Gharbi for their active coordination in Biotech Tunisia project. I believe that with continued collaboration and perseverance, we can overcome any challenges and create a brighter future for biotechnology education in Tunisia.

Warm regards.

**PR. FIORELLA ALTRUDA  
COORDINATOR OF THE BIOTECHTUNISIA  
PROJECT IN UNITO  
PROFESSOR OF MOLECULAR GENETICS  
MOLECULAR  
PRESIDENT OF THE BIOTECHNOLOGY  
CENTER "GUIDO TARONE",  
PRESIDENT OF THE DEPARTMENT OF  
MOLECULAR BIOTECHNOLOGY AND HEALTH  
SCIENCES  
UNIVERSITY OF TORINO - ITALY**

# BENCHMARKING VISIT TO THE UNIVERSITY OF TURIN

Turin, Italy from January 29th to February 2nd, 2024



BY PR. NOURHENE BOUDHRIOUA, UNIVERSITY OF MANOUBA

A Tunisian delegation of about twenty teachers representing the four Biotechnology institutes (ISBM, ISBS, ISBST, ISBB) from the universities involved in the Biotech-Tunisia project (University of Monastir, University of Sfax, University of Manouba, and University of Jendouba), as well as the Ministry of Higher Education and Scientific Research, conducted a benchmarking visit to the University of Turin from January 29th to February 2nd, 2024.



## Exploration of University-Industry Entrepreneurship at UniTo



After welcoming words from the rector of the University of Turin, Professor S. Geuna, Professors F. Altruda and R. Tolosano presented the program of the visit.

The day was marked by two enriching presentations: Professor C. Varese shared an innovative campus model promoting interaction between research and business, called Butterfly Area, followed by Dr. F. Natale, who highlighted the crucial importance of the industry liaison office in strengthening links between the university and local industry.

The visit also focused on contemporary educational approaches and the promotion of graduate employability. Six conferences were presented, highlighting the experience of the University of Turin in educational innovation, particularly in the field of Biotechnology. The activities covered included good practices for the professional integration of post-doctoral researchers and the continuous adaptation of training programs to the needs of the biotechnology industrial sector.

Two young speakers highlighted the importance of digital technologies and mathematical skills in this discipline. The day concluded with a presentation by Professor Emilio Hirsch, Director of the Center for Molecular Biotechnology at the University of Turin, outlining the mission and research activities of the center.



## Teaching Approaches and Employability at UniTo



## Focus on Technology Transfer at UniTo



The theme of technology transfer took place with several conferences led by renowned experts. Professor Angelo Bifone shared the experience of the Patent Commission of the University of Turin in the specific field of biotechnology.

An in-depth presentation of technology transfer tools was given by the head of the 2i3T incubator at the University of Turin, providing valuable insight into the practical methods used in the transfer process.

Additionally, the university's experience in European projects aimed at promoting entrepreneurship at all levels of the education system, from primary school to university, was discussed in detail.

Finally, the day concluded with interventions from investors, including the CEO of Agomab, a renowned biotechnology company specializing in the development of innovative treatments for fibrotic diseases.



### Testimony

***Innovations such as the Butterfly Area, conferences on contemporary educational approaches, technology transfer, Bio-Industrial Park initiatives and particularly the founding of the 2i3T incubator highlight the importance of collaboration between universities and businesses.***



***This experience reinforced my conviction in the potential of our international collaboration to boost the biotechnology sector in Tunisia.***

**Dr Abir Gmidem- ISBST**

# VISIT THE BIOINDUSTRY PARK SILVANO FUMERO TURIN - ITALY

BY DR YOSR HAFFANI, UNIVERSITY OF MANOUBA



## IMMERSION AT THE BIO-INDUSTRIAL LIFE SCIENCES PARK

The visit to the Bio-industrial Life Sciences Park was at the heart of the mission. The missions, visions and activities of the Bio-park were presented by F. Altruda and Dr. S. Falvo. The role of the BioPmed Innovation Cluster was presented by Dr. M. Squarciafico. Subsequently, presentations were given by the companies located on the site. Dr. A. Forlenza presented the Foundation of the Higher Institute of Biotechnology of Life Sciences, whose mission is to train students in biotechnology on site. This institution, aiming to produce operational biotechnologists, selects License 3 students to train them according to study programs developed in collaboration with industrialists in the region. After a networking lunch, the day concluded with a guided tour of the Bio-park facilities.

### Testimony

“It was an extraordinary experience which allowed me to meet renowned experts, to discuss with them about technology transfer, entrepreneurship and research and development in biotechnology applied to health



and discover innovative technologies within the “Guido Tarone” Molecular Biotechnology Center and the Bio-Industry Park in Turin.

Dr. Amine Zaouali- ISBM



# THE TRAINING ACTIVITIES OF THE BIOTECH-TUNISIA PROJECT ARE BEING DEPLOYED

BY DR TAREK HAJJI, UNIVERSITY OF MANOUBA



## TRAINING OF TRAINERS IN TUNISIAN PARTNER UNIVERSITIES

As part of the BiotechTunisia project, WPI "Training" activities took off with a series of training sessions for trainers in four Tunisian partner universities. These sessions, led by the same competent trainers, aim to strengthen the skills of educators to meet the evolving demands of the biotechnology field.

- Atelier « A la Quête de l'Approche Adéquate »  
Mise en situation (11h30-12h30)  
Discussion (13h-14h)
- Présentation des approches en faveur de l'autonomisation (14h-15h)
- Débat de clôture (15h-16h)

 Mercredi 24 Mai 2023

 Institut Supérieur de Biotechnologie de Sfax



**DR. BESMA MARDASSI**  
MAÎTRE ASSISTANTE À ISBS  
COFIL CEC "PÉDAGOGIE EN SCIENCES DE LA SANTÉ"  
ASSOCIATION FORUM TUNISIEN POUR L'ÉDUCATION

## ACTIVE LEARNING

Dr Besma Mardassi from the University of Sfax brilliantly led a session on learner empowerment: a paradigm shift. This enlightening workshop, held on May 11, 2023 at the Higher Institute of Biotechnology of Monastir and later on May 24, 2023 at the Higher Institute of Biotechnology of Sfax, explored the quest for adapted approaches to empower learners and align methods teaching on employability strategies. This enriching training is scheduled to be reproduced in the coming months in the two other partner universities.

## KNOW HOW TO EVALUATE

Just as significantly, a second session on docimology, led by Professor Nabil Sakly of the University of Monastir, emphasized the importance of evaluating learning outcomes. This insightful workshop was conducted across all four universities, ensuring a thorough understanding of assessment techniques.

## Formation présentielle en: DOCIMOLOGIE

**Pr Nabil SAKLY**  
Faculté de Pharmacie  
de Monastir



**Mercredi 10 Mai 2023 à l'Institut  
Supérieur de Biotechnologie de  
Monastir**

## EDUCATIONAL INNOVATION



Co-funded by the  
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of the European Union

### Formation des formateurs MÉTHODES PÉDAGOGIQUES

Révolutionner l'apprentissage  
avec des méthodes novatrices

23 novembre 2023  
9:30 – 15:30

Institut Supérieur de Biotechnologie de Sfax

Cible : Enseignants de l'Université de Sfax

inscription :  
<https://shorturl.at/ezCMR>  
Nombre de places limité à 24  
Premiers inscrits, premiers servis



Abir Gmidene

In addition, a third training session, focused on innovative teaching techniques for faculty members from the University of Manouba, the University of Sfax and the University of Monastir, took place on 15, 22 and November 23, 2023 respectively. Dr Abir Gmidene from the University of Manouba orchestrated this dynamic session, which will be replicated in April at the University of Jendouba.



## "ENTREPRENEURIAL SPIRIT"

A fourth training in economic intelligence and entrepreneurial innovation for the benefit of teachers from the Higher Institute of Biotechnology of Monastir ISBM, led by Dr Lobna Essid and Dr Chokri Hafsi from the University of Jendouba, was provided in a collaborative and stimulating atmosphere on December 12, 2023.



### Formation des formateurs


Innovation et intelligence  
économique en  
biotechnologie : Impact  
pédagogique

12 décembre 2023  
9:30 – 15:30

Institut Supérieur de Biotechnologie de Monastir

Cible : Enseignants de l'Université de  
Monastir

Inscription :  
<https://rb.gv/y05dxf>



Lobna ESSID & Chokri HAFSI  
Université de Jendouba  
Institut de Biotechnologie de Béja

While the project continues to deploy its educational efforts, and in parallel with the scheduled renewal of training carried out in all partner universities, another training session dedicated to the accreditation process of educational programs is looming on the horizon, under the management of the University of Jendouba, scheduled for next May.

# POSTDOCTORAL POSITION IN TUNISIA: CURRENT SITUATION AND PERSPECTIVES

BY PR NOURHENE BOUDHRIOUA, UNIVERSITY OF MANOUBA

## Framework and objectives

This survey is carried out within the framework of WP III 'Governance' of the Biotech-Tunisia project. Its objective is to analyze the situation of doctors and the contractual conditions of Post-Docs in Tunisia, focusing particularly on doctors in Biotechnologies and associated specialties. The analysis of the results will lead to the formulation of recommendations to the supervisory ministry to improve the text governing the status of Post-Doc in Tunisia (researcher contract and teaching contract). Participation in the survey was anonymous and was addressed to Post-Docs who are in a contractual position: Contractual doctor for teaching and/or research.



### Post-doc: situation, défis et opportunités

Cette enquête est effectuée dans le cadre du WP III 'Gouvernance' du projet Biotech-Tunisia 2020-2024 (Projet du programme Européen Erasmus+, CBHE, KA2, SP, 610246-EPP-1-2019-1-TN-EPPKA2-CBHE-SP, <https://biotech-tunisia.com/>). Biotech-Tunisia est un projet de partenariat qui regroupe des partenaires nationaux et étrangers dont le Ministère Tunisien de l'Enseignement Supérieur et de la Recherche Scientifique, 4 Universités Tunisiennes et 3 Universités Européennes ainsi que des partenaires associés (Centres de recherche, des acteurs du milieu socio-économique et association étudiante). L'objectif de cette enquête est d'analyser la situation des docteurs et les conditions contractuelles des Post-Docs en Tunisie. Elle aboutira à la formulation de recommandations permettant d'améliorer le texte régissant le statut du Post-Doc en Tunisie (contrat chercheur et contrat enseignant). Le terme Post-Doc correspond à la position contractuelle d'un Docteur. Ici le terme Post Doc désigne le Docteur contractuel pour l'enseignement et/ou la recherche

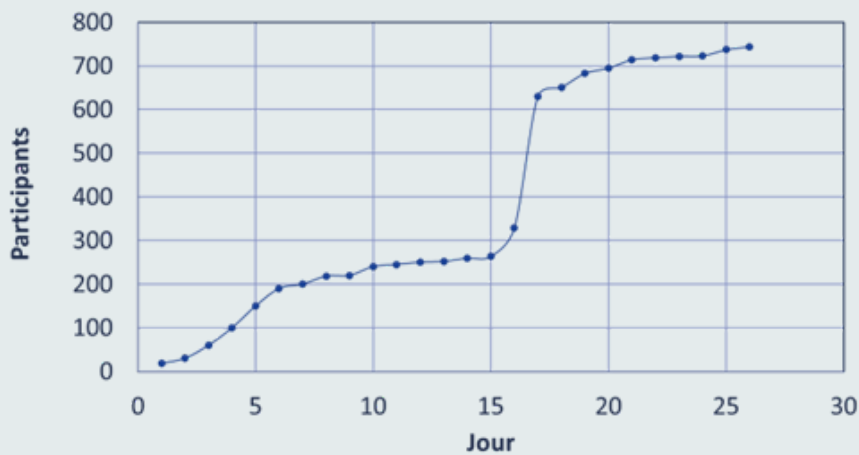
Répondre à cette enquête vous prendra entre 3 et 5 minutes. L'option anonyme a été activée

## Methodology

First a bibliographic study on similar studies in Tunisia and around the world was carried out (August and September 2023). Then the survey was designed and revised following several meetings with the various stakeholders: teachers from the consortium and outside the consortium, ministry officials and post-docs. A first launch test addressed to around twenty teachers and post-docs made it possible to adjust/clarify the questions and reduce them to the most relevant so that the real-time survey does not exceed 5 minutes. The survey form includes around thirty questions structured in 5 sections (general information, search for Post-Docs contractual conditions and status, research and teaching functions, well-being, job insecurity and opportunities).

## Effective launch

The effective launch of the survey was ensured on October 28, 2023. The dissemination was carried out via (i) the Ministry of Higher Education and Scientific Research to the heads of Doctoral Schools and teachers of Tunisian universities involved in the project, (ii) via the project website, (iii) social networks (of establishments, of the ATDocs Post doc association). Fifteen days after the first launch, a recall was carried out using the various tools above and involving the ANPR and the Ministry of Higher Education and Scientific Research. Following this second launch, the number of participants doubled and reached 780 participants.



Evolution of the number of participants depending on time and the two phases: launch and relaunch

## Data analysis and expected results

The data obtained were sorted, coded and then processed by the XLStat software. The results obtained were discussed and analyzed during the WPIII-Governance meetings. The proposals resulting from the survey made it possible to formulate recommendations which were included in a white paper which will be submitted to the supervisory ministry for evaluation. This survey and this white booklet could serve as a decision-making tool to define other specific and regular surveys in order to implement a strategic plan for the governance of the Post-Docs portfolio.

## Publication of results

The outputs of the survey will be communicated soon on the project website. A book chapter presenting these results, entitled *Insight into postdoctoral position in Tunisia: Situation, challenges and opportunities*, is accepted for publication in the book entitled *Building Resiliency in Higher Education: Globalization, Digital Skills, and Student Wellness*, (Nourhene Boudhrioua , Manel Ben M'hadheb, Fethia Skhiri, Pedro Xavier, Malek Ben Zid, Cristina Silva, Jawhar Gharbi).

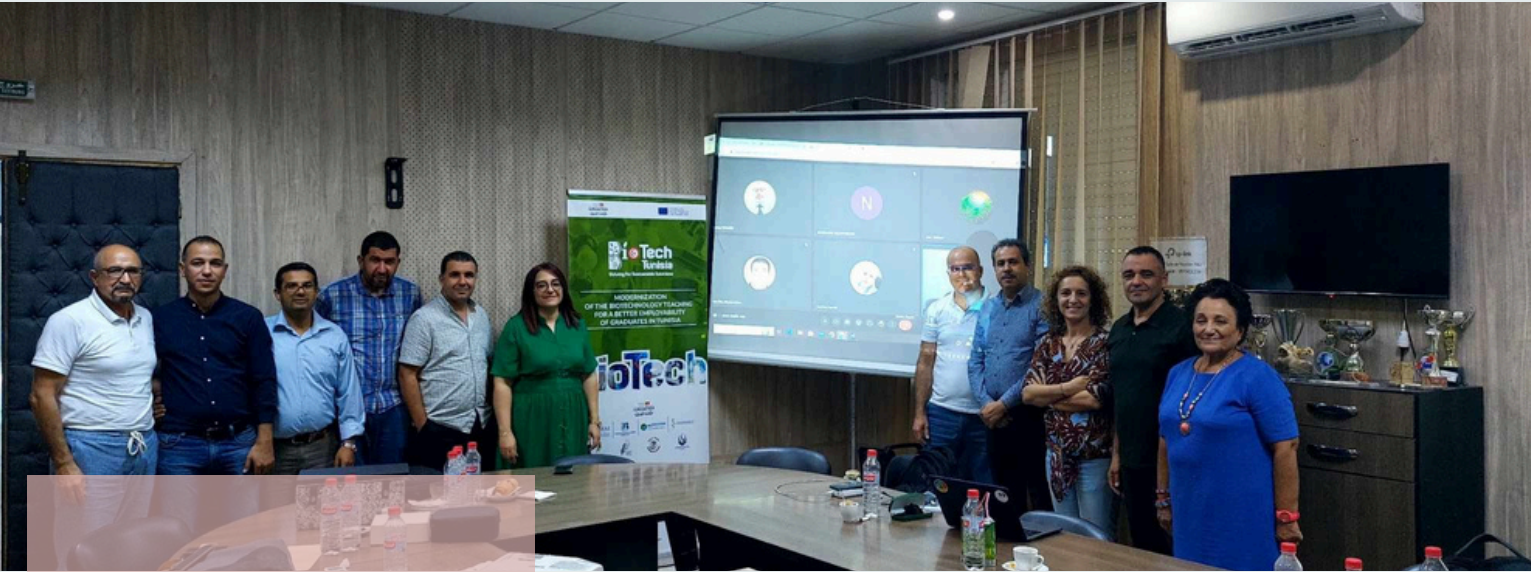
*Insight into postdoctoral position in Tunisia: Situation, challenges and opportunities, 2024. Building Resiliency in Higher Education: Globalization, Digital Skills, and Student Wellness, pp-420.*

Editor: Mustafa Kayyali.

DOI: 10.4018/979-8-3693-5483-4. ISBN13: 9798369354834 | EISBN13: 9798369354858).

# Quality Control Biotech Tunisia

BY DR ZIED ZARAI, UNIVERSITY OF SFAQ



## The BiotechTunisia WP IV meeting: pivot of coordination and evaluation for effective progress

The meeting of WP IV Quality Control of the BiotechTunisia project, which was held on November 4, 2023 at the Higher Institute of Biotechnology of Sfax, University of Sfax, was an essential milestone to assess the progress and coordinate the project activities. Bringing together the heads of the different WPs as well as the university coordinators, this meeting allowed a careful evaluation of the progress of the various activities, the deliverables achieved and the development of strategies to acquire the set objectives.

Lively discussions took place to identify possible delays and suggest effective corrective measures. Particular attention was paid to maintaining the quality of deliverables while respecting deadlines.

The GANTT chart was adjusted according to the new deadlines for planned activities, while a self-assessment report was considered, based on a model proposed by colleagues at the University of Sfax. This report should provide an objective assessment of project performance and identify areas requiring improvement.

A careful review of the terms of reference of the external expert responsible for evaluating the progress of the project was undertaken to ensure an impartial and exhaustive evaluation of all activities, thus ensuring the quality and relevance of the results obtained.

Another major initiative focused on the deliverable "Student and graduate monitoring system", for which colleagues from the University of Jendouba offered to share an institutional model. This approach aims to harmonize practices and facilitate the establishment of effective systems for monitoring students and graduates.

In perspective, several initiatives have been planned, including accreditation awareness days, training for trainers, workshops on entrepreneurship and intellectual property, as well as a national accreditation day. These actions aim to strengthen the capacities of project stakeholders and guarantee its long-term success.

The project is scheduled to close at the beginning of July 2024, marking the conclusion of an important phase of collaboration aimed at improving biotechnology education in Tunisia.

# INTERNATIONAL DAY

BY PROF. MOHAMED BOUAZIZ, UNIVERSITY OF Sfax



As part of the activities of the Biotech Tunisia project, a day of conference and training was organized at the Higher Institute of Biotechnology of Sfax, University of Sfax.

## THE OLIVE TREE AND THE QUALITY OF OLIVE OIL: IMPACTS OF CLIMATE CHANGE

This day was a major event aimed at promoting advances and initiatives in the field of biotechnology in Tunisia. Researchers, students and industry professionals came together to exchange knowledge, share experiences and discuss the latest innovations in the field.



The conference was an opportunity for experts from the Biotech Tunisia project to present their research work, their discoveries and their results. The topics covered a wide range of themes, from biotechnology applications in agriculture and the environment to medicine and health.



The congress, which was held as part of the International Day of the Olive Tree and Olive Oil Quality: Impacts of Climate Change, in Sfax on December 13, 2023, began with a word of warm welcome presented by the chairperson Pr. Mohamed Bouaziz, the president of the university and the governor of Sfax. The first part of the event was characterized by a series of informative and insightful presentations from several renowned experts in the field.



# Expert Insights: The Challenges of the Olive Oil Industry

The session began with a lecture by Professor Mohamed Bouaziz, analyzing the chemical composition of olive oil and its health benefits. Next, Mr. Faouzi Zayani detailed the marketing challenges in the olive oil industry and the strategies needed to address climate change. Professor Bechir Ben Rouina discussed the impact of climate change on olive groves, particularly in the Régime Matoug region, highlighting the necessary adaptation measures. Finally, Dr. Ing. Hazem Jabeur examined the standard and marketing of virgin olive oil, emphasizing the importance of quality in maintaining consumer confidence and developing new markets.



In summary, this first part of the congress offered an in-depth overview of the issues and opportunities related to the chemical composition of olive oil, the challenges posed by climate change, as well as the standards and marketing strategies to promote this valuable product to the global market.

## Health Impact and Marketing of Olive Oil

The second session of the day delved into the health implications of olive oil and its strategic positioning in the market. Esteemed experts illuminated the manifold health advantages of olive oil, emphasizing its potent antioxidant properties and its role in safeguarding heart health. Recent research findings underscored its positive impact on cardiovascular well-being and its potential in mitigating chronic ailments like diabetes. In parallel, the discourse encompassed an analysis of marketing intricacies, exploring both challenges and opportunities inherent in global market dynamics. Topics ranged from navigating evolving consumer preferences to crafting robust branding strategies, alongside concerted efforts aimed at upholding product integrity and ensuring authenticity.

## Sensory Workshop: Training the Next Generation of Olive Oil Experts

The concurrent workshop, running alongside the conference, provided students with a hands-on opportunity to hone their expertise in sensory analysis of olive oil. This practical session not only bolstered their practical proficiency but also enriched their comprehension of the nuanced organoleptic qualities inherent in olive oil. Through immersive learning, participants familiarized themselves with sensory evaluation methodologies aligned with global benchmarks for olive oil quality assessment. This hands-on experience proved instrumental in cultivating students' acumen within a pivotal sector of the industry, underscoring the indispensable role of practical training in nurturing future professionals.