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Italiadomani  
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UNIVERSITÀ  
DEGLI STUDI DELLA  
BASILICATA



 UNIVERZITET U SARAJEVO  
PRIRODNO-MATEMATIČKI  
FAKULTET



 diSS  
DIPARTIMENTO DI  
SCIENZE  
DELLA SALUTE



## Advanced skill course (hybrid) Secondary Metabolites: From Production to Utilization – Tools, Techniques, and Applications

**Organizers:** University of Basilicata, Department of Health Sciences;

**Co-organizers:** University of Sarajevo, Faculty of Science; University of Naples "Federico II", Department of Pharmacy

### Schedule:

Virtual session: 22<sup>nd</sup> – 23<sup>rd</sup> January

Day 1: 10:00-11:00 | Day 2: 10:00-11:00

In presence session: 2<sup>nd</sup>-4<sup>th</sup> February

Day 1: 10:00-16:00 | Day 2: 10:00-21:00 | Day 3: 10:00-16:00

### Target audience:

PhD students or postdoctoral researchers in Biology, Biotechnology, Pharmacy, Agricultural Sciences, or related disciplines.

### Objectives:

- Introduce fundamental and advanced concepts of secondary metabolite biosynthesis
- Demonstrate *in vitro* culture techniques for enhancing metabolite production
- Explore strategies for metabolite identification, quantification, and application
- Foster interdisciplinary skills and hands-on experience in the lab
- Stimulate regional networking and knowledge exchange

### Expected Outcomes:

- Strengthened knowledge on secondary metabolite production
- Skills in *in vitro* culture and basic phytochemical techniques
- Awareness of translational applications of plant-derived compounds
- Workshop certificate and materials provided to participants

### Contacts:

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SULIEIA website: <https://sulieia.it/>

# PROGRAMME

## Virtual sessions

Link: <https://meet.google.com/fue-hkcz-joh>

### **Thursday 22<sup>nd</sup> January 2026 - Introduction to Secondary Metabolites**

10.00: Welcome and course overview

*SULIEIA Team*

10.15: Fundamentals and Relevance in Plant Science

*Prof. dr. Saida Ibragić, University of Sarajevo*

### **Wednesday 23rd January 2026 - Introduction to analysis of Secondary Metabolites**

10.00: Methods for Secondary metabolite analysis and its use in plant stress research

*Dr. Sanja Čavar Zeljković, Palacký University Olomouc*

10.30: LC-MS analyses of plant metabolome

*Dr. Germana Esposito, University of Naples Federico II*

## In-presence sessions

*Amfiteatar three physis, University of Sarajevo, Faculty of Science,  
Zmaja od Bosne 33-35, Sarajevo, Bosnia and Herzegovina*

### **Monday 2<sup>nd</sup> February 2026 – Theoretical and Practical Foundation**

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**09.00: Registration of participants**

**10.00: Opening session**

- Welcome and presentation of SULIEIA Project

*Prof. Valeria Costantino, University of Naples Federico II*

- "Photography in Research", an innovative course in the frame of SULIEIA

*Salvatore Esposito, University of Naples Federico II*

- BioFarmLab: Laboratory of Physiological and Pharmaceutical Biology

*Prof. Luigi Milella, University of Basilicata*

**10.30: Session 1: Focus on Secondary Metabolites**

- Importance in traditional medicine

*Doc.dr Armin Macanović, University of Sarajevo, Faculty of Science*

- Importance in pharmaceutical, nutraceutical, and agricultural sectors

*Prof. dr Kemal Durić, University of Sarajevo, Faculty of Pharmacy*

**11.30 – 12.00: Coffee break**

**12.00: Session 2: Biosynthetic Pathways**

- Phenolics, alkaloids, terpenoids – synthesis and regulation  
*Dr. Daniela Russo, University of Basilicata*

- Role in plant physiology and stress response

*Prof. dr Saida Ibragić, University of Sarajevo, Faculty of Science*

**13.00 – 14.00: Lunch break**

**ROOM: Department for Biology**

**14.00: Session 3: *In vitro* Culture as a Tool**

- Callus induction, suspension cultures, elicitation strategies  
*Prof. dr. Erna Karalija, University of Sarajevo, Faculty of Science*

**14.30 – 16.00: Session 4: Practical Laboratory Work**

- Sterile techniques, media preparation, explant selection

- Initiation of callus and root cultures

*Prof. dr. Erna Karalija, University of Sarajevo, Faculty of Science*

*Prof. dr. Sabina Dahija, University of Sarajevo, Faculty of Science*

*Arnela Demir, MA, University of Sarajevo, Faculty of Science*

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**Tuesday 3<sup>rd</sup> February 2026 – Focus on Analytical and Applied Perspectives**

**10.00: Session 5: Extraction and Profiling of Metabolites**

- Overview of analytical techniques: TLC, HPLC, UV-Vis, GC-MS

*Prof. dr Saida Ibragić, University of Sarajevo, Faculty of Science*

- Hands-on demonstration: sample preparation, extraction

*Prof. dr. Saida Ibragić, University of Sarajevo, Faculty of Science*

**11.00: Session 6: Voices of young researchers**

- Presentations by participants

**12.30 – 14.00: Lunch break**

**15.00: Visit of Sarajevo**

**19.00: Traditional dinner**

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**Wednesday 4<sup>th</sup> February 2026 – Translational perspectives and final remarks**

**10.00: Session 7: From Lab to Industry**

- Utilisation examples in agriculture

*Prof. dr. Vasileios Fotopoulos, Cyprus University of Technology*

- Bioactivity testing

*Prof. dr. Anja Haverić, University of Sarajevo, Institute for Genetic Engineering and Biotechnology, INGEB*

- Insight into the Interaction of Olive Oil's Key Metabolites and Monoamine Oxidase B: Neuroprotective Role of Phenolic Compounds

*Nikolay T. Tzvetkov, Institute of Molecular Biology "Rumen Tsanev"*

**11.00 – 11.30: Coffee break**

- *In vivo* models for evaluating metabolite efficacy

*Dr. Ludovica Lela, University of Basilicata*

- Optimisation of extraction processes and advanced metabolite delivery systems

*Dr. Immacolata Faraone, University of Basilicata*

- *Utilisation of secondary metabolites - examples in pharmaceutics and cosmetics*

*Prof. dr. Alisa Elezović, University of Sarajevo, Faculty of Pharmacy*

**12.30 – 14.00: Lunch break**

**14.30: Session 8: ASC Evaluation**

- Interactive closing challenge

*Dr. Vittorio Carlucci, University of Basilicata*

*Dr. Nadia Benedetto, University of Basilicata*

**15.30: Certificate ceremony and official closing**