BenBedPhar

BENBEDPHAR TRAINING SCHOOL

BOOK OF ABSTRACTS AND PROGRAM OVERVIEW

THE NRF2 NETWORK: MOLECULES, PATHWAYS, AND THERAPEUTIC STRATEGIES IN CHRONIC DISEASE

26-30 May 2025, Ohrid, North Macedonia

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EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY

Welcome to the Training School in Ohrid!

It is our great pleasure to welcome you to the Training School "The NRF2 Network: Molecules, Pathways, and Therapeutic Strategies in Chronic Disease," which will be held from 26 to 30 May 2025, in the historic city of Ohrid, North Macedonia.

This event is organized in the frame of BenBedPhar COST Action, by local support of the Faculty of Natural Sciences and Mathematics at Ss. Cyril and Methodius University in Skopje and Faculty of Medical Sciences, Goce Delcev University, Stip.

This Training school will offer participants a comprehensive exploration of the NRF2 signaling pathway, focusing on its molecular mechanisms and its pivotal role in oxidative stress, metabolic disorders, and chronic diseases. The program features expert-led lectures, bioinformatic workshop and interactive sessions, providing an opportunity to present your research and results, fostering scientific exchange and collaboration.

Antonio Cuadrado & local coordinators

LECTURES OVERVIEW

1 Antonio Cuadrado (Spain)

antonio.cuadrado@uam.es
· Lecture 1: General introduction to NRF2
· Lecture 2: Targeting transcription factor NRF2 for brain protective therapy in Alzheimer's disease

2 Gina Manda (Romania)

gina.manda@gmail.com
· Lecture 1: NRF2 biomarkers in blood
· Lecture 2: NRF2 in cancer therapy

3 Albena Dinkova-Kostova (UK)

a.dinkovakostova@dundee.ac.uk)
· Lecture 1: NRF2 in inflammation
· Lecture 2: NRF2 pharmacology

4 Anna Grochot-Przeczek (Poland)

anna.grochot-przeczek@uj.edu.pl
· Lecture 1: KEAP1 as a key protein in O_2 and NO biology
· Lecture 2: Cytoplasmic and nuclear functions of heme oxygenase-1

5 Andrey Abramov (UK)

a.abramov@ucl.ac.uk
· Lecture 1: Regulation of energy metabolism in brain by Nrf2: implication to epilepsy excitotoxicity
· Lecture 2: Interplay of calcium, mitochondria and oxidative stress in neurodegenerative diseases: activation of Nrf2 as a neuroprotection

6 Anna-Liisa Levonen (Finland)

anna-liisa.levonen-harju@uef.fi
· Lecture 1: Causes and consequences of NRF2 dysregulation in cancer
· Lecture 2: Technical tips to study NRF2 signaling

7 Tatjana Ruskovska (North Macedonia)

tatjana.ruskovska@ugd.edu.mk
· Lecture 1: Use of integrative bioinformatic analyses to decipher molecular mechanisms of action of plant-derived bioactive compounds

Wednesday 28 May

Chairpersons: Maria Barbosa-Azevedo & Raquel Bozzo

09:00-09:50 NRF2 pharmacology
(Albena Dinkova Kostova)

09:50 – 10:40 Regulation of energy metabolism in brain by Nrf2: implication to epilepsy excitotoxicity
(Andrey Abramov)

10:40 – 11:10 Coffee break with poster viewing

Chairpersons: Şeyma Çimen & Cagla Kiser

11:10 – 12:00 Use of integrative bioinformatic analyses to decipher molecular mechanisms of action of plant-derived bioactive compounds
(Tatjana Ruskovska)

12:00 - 12:30 Meet the Experts: Students–Teachers Round table Discussion AC, GM

12:30 - 13:15 Oral Presentations:

Development of carbon dots as versatile biomedical tools **(Yingru Zhou)**

Peroxiporin AQP5 as a Modulator of Redox-Sensitive Pathways in Breast Cancer Cell Lines Exposed to H_2O_2 **(Ivan Lučić)**

AMP(K)lifying NRF2 signalling: the influence of the AMPK activator metformin on Nrf2 and Bach1 levels as well as on phenotypic responses in A549 lung cancer cells **(Shara Natalia Sosa Cabrera)**

TRAINING LECTURERS

TATJANA RUSKOVSKA

Faculty of Medical Sciences,
Goce Delcev University, Stip, North Macedonia
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Tatjana Ruskovska graduated from the Faculty of Natural Sciences and Mathematics at Ss. Cyril and Methodius University in Skopje, at the Institute of Biology, study group of biochemistry and physiology, as the best student of her generation.
From 1994 to 2010, she worked at the Central Clinical Laboratory of the Military Hospital in Skopje, initially as a biochemist and later as the Head of the Laboratory (2003 - 2010).

During this time, she completed her master's degree (1997) and doctoral studies (2002) at the Faculty of Natural Sciences and Mathematics at Ss. Cyril and Methodius University in Skopje.
In 2009, Tatjana Ruskovska was appointed as an external assistant professor at the Faculty of Medical Sciences at Goce Delcev University in Stip. Since 2010, she has been a full-time faculty member at the Faculty of Medical Sciences at Goce Delcev University, initially as an assistant professor and later as a professor. From 2011 to 2014, she served as Vice Dean, and from 2018 to 2020, she served as President of the Doctoral Studies School at the Faculty of Medical Sciences at Goce Delcev University in Stip.
During the 2014/15 academic year, she worked as a visiting professor at the Department of Biochemistry, Molecular Biology, and Biophysics at the University of Minnesota, USA, as a Fulbright Scholar.
In November 2024 she was awarded the prestigious title of Best Scientist at Goce Delcev University for the year 2023.
More information about her research can be found on ResearchGate and PubMed, on the following links: https://www.researchgate.net/profile/Tatjana-Ruskovska
https://pubmed.ncbi.nlm.nih.gov/?term=ruskovska&sort=date

Lecturer's Abstract

Use of integrative bioinformatic analyses to decipher molecular mechanisms of action of plant-derived bioactive compounds

Tatjana Ruskovska[1], Dragan Milenkovic[2]

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A plethora of bioactive compounds are present in plant-based foods and medicinal plants. Previous research has demonstrated positive health effects of many of these compounds, either as adjuvant therapy with medicinal plants or through consumption of a nutrient-dense diet designed to preserve and promote human health.

Human randomized trials have demonstrated significant inter-individual variabilities in the health effects of plant-derived bioactive compounds. Several factors contributing to these differences have been identified, including sex, age, gut microbiome, comorbidities, and, importantly, genetic factors. Among these, genetic factors remain the least studied.

To identify genetic polymorphisms underlying the inter-individual variabilities in the health effects of plant-derived bioactive compounds, a detailed investigation of their molecular mechanisms of action is necessary. The most effective approach involves applying multi-omics technologies and integrative bioinformatics analyses, which provide a comprehensive, holistic insight into modulation at the transcriptome, proteome, metabolome, and microbiome levels. This approach facilitates the identification of key molecular mechanisms of action and the targeting of crucial, potentially determinant genes, which will later be thoroughly examined in carefully designed genetic studies.

Findings from previous research have identified NRF2 transcriptional activation as one of the significantly modulated pathways in response to the consumption of a plant extract rich in bioactive compounds. These results will be presented and thoroughly discussed during our training school.

Contact Information

Local organizers

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