



7<sup>th</sup> International Symposium on  
**Phytochemicals in Medicine and Food**

7-ISPMPF, August 1-7, 2023, Beijing, China



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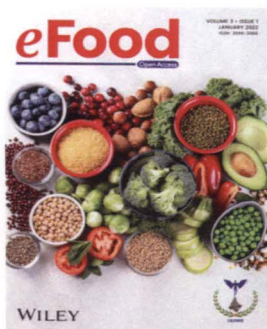
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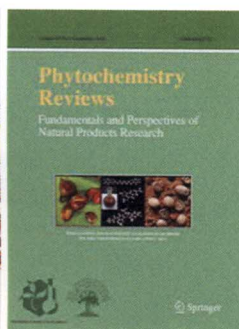
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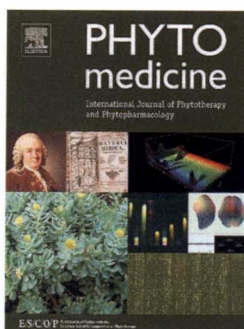
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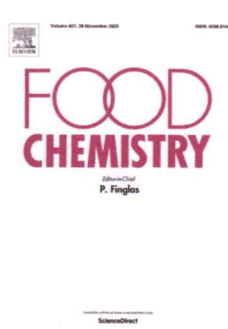
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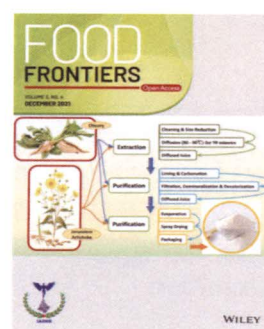
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<b>August 04</b>		
<b>08:30-10:25</b>	<b>Session 7</b> (Hang Xiao, Yuchen Zhu)	<b>Session 8</b> (Haroon Khan, Danyue Zhao)
<b>08:30-08:45</b>	<b>OL14:</b> Uranzaya Dashzeveg, Institute of traditional medicine and technology, Mongolia The nephroprotective activity of <i>Juniperus sabina</i> L. extract using rat model	<b>OL17:</b> Hansong Yu, Jilin Agricultural University, China Structure, properties and potential prebiotic activity of high-purity insoluble fiber from soybean residue (Okara)
<b>08:45-09:00</b>	<b>OL15:</b> Wenchin Yang, Academia Sinica, Taiwan, China Phytochemistry, pharmacology and mode of action of the anti-bacterial <i>Artemisia</i> plants	<b>OL18:</b> Alessandro Maugeri, University of Messina, Italy Bisphenol A-induced damage in human umbilical vein endothelial cells is hampered by a red grape juice extract
<b>09:00-09:15</b>	<b>OL16:</b> Jihang Chen, Chinese University of Hong Kong, China Antioxidant and anti-metabolic syndrome effects of <i>Cynomorii Herba</i>	<b>OL19:</b> Baiyi Lu, Zhejiang University, China Single-Cell RNA sequencing reveals stigmaterol regulates foam cell formation in atherosclerosis
<b>09:15-09:35</b>	<b>IL14:</b> Pharkphoom Panichayupakaranant, Prince of Songkla University, Thailand Preclinical safety assessment of acute and subchronic exposures to high water-soluble curcuminoid extracts	<b>IL16:</b> Hui-Min Wang, National Chung Hsing University, Taiwan, China Biomedical therapeutic developments for melanoma- don't ignore lumps on your skin - know the deadliest type of melanoma
<b>09:35-09:55</b>	<b>IL15:</b> Suowen Xu, University of Science and Technology of China, China Urolithin A protects against endothelial dysfunction and atherosclerosis in mice	<b>IL17:</b> Danyue Zhao, The Hong Kong Polytechnic University, China Potentiating the bioefficacy of polyphenols through teaming up with functional gut bacteria
<b>09:55-10:25</b>	<b>PL7:</b> Yun Suk Huh, Inha University, South Korea Antioxidative effect of Aloe vera Against the Toxicity Induced by Malathion in Wistar Rats	<b>PL8:</b> Maria Daglia, University of Napoli Federico II, Italy, Invited Lecture A new combination of <i>Cistus x incanus</i> L. and <i>Scutellaria lateriflora</i> L. as protective agents against periodontal diseases
<b>10:25-10:50</b>	<b>Coffee break</b>	
<b>10:50-12:25</b>	<b>Session 9</b> (Jelena B. Popović-phil, Chao Zhao)	<b>Session 10</b> (Avi Shpigelman, Haixia Yang)
<b>10:50-11:05</b>	<b>OL20:</b> Wen Ma, Ningxia University, China Molecular interpretation of vegetable aroma in NingXia red wines	<b>OL23:</b> Ronghui Gu, Guizhou University, China UPLC-QTOF-MS based identification of chemical constituents, antioxidant, and antitumor activity of <i>Dendrobium nobile</i>
<b>11:05-11:20</b>	<b>OL21:</b> Olgica Nedic, University of Belgrade, Serbia Analytical approaches in studying interactions between antioxidants from food and human proteins from the blood	<b>OL24:</b> Jitkunya Yuenyong, Chiang Mai University, Thailand Development of Simultaneous Analysis for sesame ( <i>Sesamum indicum</i> L.) phytochemicals using high performance liquid chromatography
<b>11:20-11:35</b>	<b>OL22:</b> Lingjun Ma, China Agricultural University, China Arecoline degradation mechanism and inhibition strategy	<b>OL25:</b> Yixi Xie, Xiangtan University, China A novel gallic acid electrochemical sensor based on glass carbon electrode modified by ZIF-67 derived carbon composite
<b>11:35-11:55</b>	<b>IL18:</b> Etil Güzelmeriç, Yeditepe University, Turkey Comparative evaluation of the chemical compositions and bioactivity profiles of pollen samples collected by honeybees from the flowers of herbaceous and woody plants in Türkiye and Slovenia	<b>IL19:</b> Niranjan Koirala, Gandaki Province Academy of Science & Technology, Nepal LC-MS based Metabolite profiling, In-vitro antioxidant and In-Vivo Anti-hyperlipidemic activity of <i>Nigella sativa</i> extract
<b>11:55-12:25</b>	<b>PL9:</b> Feng Chen, Clemson University, USA Characterization of volatile aromas of Wujiapi medicinal liquor	<b>PL10:</b> Mingfu Wang, Shenzhen University, China Polyphenol loaded $\beta$ -D-glucan delivery systems and their potential immunomodulation of macrophage
<b>12:30-14:00</b>	<b>Lunch</b>	

## **OL21: Analytical approaches in studying interactions between antioxidants from food and human proteins from the blood**

Olgica Nedić

*Institute for the Application of Nuclear Energy, Department of Metabolism, University of Belgrade, Banatska 31b, 11080 Belgrade, Serbia*

Understanding the interactions between antioxidants and human proteins has gained attention over the past two decades, although most studies are still based on *in vitro* experiments. Relatively simple models are needed to capture the effect. Most work has been done with one protein and one antioxidant. However, there are hundreds of antioxidants in foods and thousands of plasma proteins that can form a coupling pair, and only a small fraction of these have been studied. Binding can affect protein conformation, stability and function, and the effect can be activating, inhibitory or modulatory. A number of methods have been used to study the binding properties and structural and functional changes of proteins and antioxidants. Altered protein fluorescence confirms interaction due to changes in the environment of aromatic amino acids. Titration of proteins with varying ligand concentrations is used to calculate the affinity constant, determine the mechanism of quenching, and thermodynamic parameters. The latter can also be evaluated by isothermal titration calorimetry. Surface plasmon resonance can detect an increase in surface mass due to complex formation, while mass spectrometry can confirm only strong interactions that resist ionization conditions. UV/VIS absorption spectroscopy detects conformational changes in proteins by capturing the effects of the altered environment near aromatic amino acids. Near-UV CD spectroscopy reveals changes in the chiral environment around aromatic structures (protein tertiary structure), while far-UV CD and FTIR evaluate the effects on elements of protein secondary structure. X-ray and neutron scattering methods provide global information on the size, shape and folding state of the protein in solution. Determination of the melting temperature of the complex helps assess the effects on protein rigidity. Docking simulations predict the binding site(s) of the antioxidant by matching known structural data on binding partners. A number of assays can be used to investigate a protective effect of the antioxidant bound to the protein under artificially induced oxidative stress. A decrease in antioxidant activity of the antioxidant itself in the complex can be evaluated by free radical scavenging methods. The most frequently studied interactions are between antioxidant molecules and human serum albumin. Interactions have been recorded with 86 antioxidant species. Less work has been done with other human blood proteins such as transferrin,  $\alpha$ 2-macroglobulin, fibrinogen and hemoglobin. No results have been reported on the interaction with immunoglobulins. Most articles report only the existence of the interaction, which is usually assessed by structural changes in the proteins. A few articles describe the functional effects of complex formation. Data for the same interacting pair sometimes vary between studies and may even be contradictory. Extrapolation of results between different species should not be done because protein behavior is species-specific. Therefore, the research field of antioxidant-protein interactions remains largely open. Separation of individual proteins from a complex mixture, such as human plasma, without disturbing the interaction between antioxidants and proteins, and detection of bound individual antioxidants is still an issue to be solved.