Analytical and Bioanalytical Chemistry (2018) 410:3405–3406
https://doi.org/10.1007/s00216-018-1024-8

EDITORIAL

Discovery of bioactive compounds

Anna Laura Capriotti[1] · Chiara Cavaliere[1] · Aldo Laganà[1]

Published online: 23 March 2018

Interest in bioactive compounds obtainable from natural sources, mainly various plant organs, mammalian milk, eggs, meat, and fish, but also microalgae, macroalgae, and bacteria, has increased considerably in recent years. The attention paid to bioactive compounds is confirmed by the large amount of literature published in this field, and also by the several calls for the identification and recovery of valuable bioactives from renewable resources within the European Union Horizon 2020 program.

Compounds with biological activity are either peptides or small molecules, in particular phenolics. Bioactive peptides are very heterogeneous protein fragments, usually containing up to 20 amino acids, with some beneficial activity for human health. Sometimes these peptides are endogenous in the matrix, but more often to become active they need to be released from the parent protein by hydrolysis or some food processing (ripening, fermentation, cooking). The most common functions exerted by bioactive peptides include antioxidant, antimicrobial, anti-inflammatory and angiotensin-converting enzyme inhibitor activities, as well as antiproliferative, antimutagenic, anticancer, antithrombotic, and hypocholesterolemic activities.

Among nonpeptide bioactive molecules, there are many plant metabolites, such as phenolics (e.g., flavonoids, anthocyanins, phenolic acids, curcuminoids, other polyphenols), alkaloids, carbohydrates, carotenoids, fat-soluble vitamins, phytosterols, polyunsaturated lipids, and organosulfur compounds. The most frequently reported properties of these compounds are antioxidant, anti-inflammatory, antibacterial, and immunomodulatory activities; indeed, they could help to prevent diseases, including cancer, cardiovascular illness, neuronal degenerative diseases, and diabetes.

With bioactives, attention is often devoted mostly to assess the activity of the fraction where these compounds were isolated, whereas the identification and validation of both the structure (mainly achievable by mass spectrometry techniques) and the bioactivity of the single compound is neglected.

For these reasons, we wished to produce a topical collection focused on the critical analytical points in discovering new bioactive compounds (i.e., their separation, identification, and bioactivity assessment and validation). We think we have reached our goal, collecting four critical reviews and 12 research articles.

We would like to thank all authors for their high-quality contributions to this topical collection. We would also like to acknowledge the reviewers for their accurate and constructive criticisms. Finally, we would like to thank the Editorial Office and editors of *Analytical and Bioanalytical Chemistry* for their valuable cooperation and support.

We hope that this topical collection will provide an analytical prospective and useful support for researchers working in the field of bioactive compounds.

Published in the topical collection *Discovery of Bioactive Compounds* with guest editors Aldo Laganà, Anna Laura Capriotti and Chiara Cavaliere.

✉ Chiara Cavaliere
chiara.cavaliere@uniroma1.it

[1] Department of Chemistry, Università di Roma "La Sapienza", Rome, Italy

Anna Laura Capriotti is Assistant Professor of Analytical Chemistry in the Department of Chemistry, University of Rome "La Sapienza." Her main research interests are focused on the development of new analytical methods and tools based on liquid chromatography and high-resolution mass spectrometry for protein, peptide, and small molecule characterization. She has been able to apply these tools to issues of biological and biochemical relevance as well as in the fields of nutraceutical analysis and food analysis. She has also contributed fundamental research in the study of the interaction between liposomes and biological fluids. She is the author or coauthor of more than 90 articles in international peer-reviewed journals, cited approximately 1700 times, with a resulting *h*-index of 23. She is a member of the Editorial Board of *Journal of Essential Oil Research*.

Chiara Cavaliere is Associate Professor of Analytical Chemistry in the Department of Chemistry, University of Rome "La Sapienza." Her research is aimed at the development of new analytical methods based on liquid chromatography coupled with (high-resolution) mass spectrometry, with application to the determination of natural and anthropogenic organic compounds in food, biological, and environmental matrices. Flavonoids, mycotoxins, and emerging contaminants are the main target of interest. Differential proteomic analysis and mass spectrometry-based metabolomics profiling are other relevant research fields. She is the author or coauthor of more than 90 articles in international peer-reviewed journals, with more than 2500 citations and an *h*-index of 27. She is a member of the Editorial Board of *Applied Sciences*.

Aldo Laganà is Full Professor of Analytical Chemistry in the Department of Chemistry, University of Rome "La Sapienza." His main research interest is the development of novel methods based on liquid chromatography coupled with mass spectrometry to determine trace contaminants in food, biological, and environmental samples. The compounds of interest are mainly mycotoxins, estrogenic compounds, emerging contaminants, and natural compounds. In the last 10 years, he has focused on differential proteomics and metabolomics analysis. He is the author or coauthor of more than 210 articles in international peer-reviewed journals, cited approximately 5400 times, with a resulting *h*-index of 40. He is member of the Editorial Board of *Analytical and Bioanalytical Chemistry* and Editor of *Toxins*.