(Bio)Analytical research in Latin America

Marco A. Zezzi Arruda · Lauro T. Kubota

Published online: 28 July 2013
© Springer-Verlag Berlin Heidelberg 2013

Analytical chemistry is present in many areas of science in terms of research and in routine activity in our lives. In several countries in the world, such as the USA, the UK, Germany, France, and others, analytical chemistry appears in a diffuse way and sometimes its importance is questioned as a discipline by itself. This behavior can be explained by the strong tendency on transdisciplinary work. However, in Latin America, analytical chemistry still keeps its classic style as a discipline; in particular, Brazil is considered the “breeding ground” of the analytical chemists. Taking into account the areas of chemistry in Brazil, analytical chemistry is one of the largest and is continuing to grow quickly. In the preceding years, analytical chemistry has presented a strong adherence to the concept of life sciences, where the word “bio” is the flagship. Traditional analytical chemistry has moved to the transdisciplinary focus, and bioanalytical chemistry has emerged as a strong area in the world. The trend in Latin America is similar, but somewhat slower compared with the USA and Europe. However, research in bioanalytical chemistry has increased with consistency in the last 5 years; for example, in Brazil, an exponential growth has been observed. The most prominent technique in this growth is mass spectrometry,

followed by chromatography and fluorescence. However, it is important to highlight the growth in research in point-of-care, starting with biosensors and then focusing on disposable devices such as paper analytical devices (PAD). Subjects such as omics, speciation, and natural substances have attracted much attention among analytical chemists, and numerous papers have been published in the literature. In Brazil, Instituto Nacional de Ciência e Tecnologia de Bioanalítica (INCTBio), a National Institute of Science and Technology in Bioanalytics was created in 2009, which certainly was very important for the rapid expansion of Bioanalytical Chemistry in Brazil. The initiatives like INCTBio will certainly produce the expertise necessary for driving a long-standing development of the area. Then, after reading some works developed in Latin America and editing this issue, it was possible to realize that Latin America is emerging as a region with a strong potential in bioanalytical chemistry; besides Brazil, Argentina and Chile are also being represented in this issue with interesting contributions. The major diversity came from Brazil, with contributions from paper-based devices to oxidative footprinting experiments. Additionally, different materials are being used for bioanalytical purposes, such as nanostructured materials, molecularly imprinted polymers, or solid phase as extractor, as well as applications of mass spectrometry, including ion mobility are also emphasized. However, up to date applications focusing on metallomics, ionic liquids, and sorptive extraction are also presented by countries such as Argentina and Chile.

In this way, the present topical collection reports on some works related to bioanalytical, showing a small but representative view of Latin America.

Published in the topical collection *(Bio)Analytical Research in Latin America* with guest editors Marco A. Zezzi Arruda and Lauro Kubota.

M. A. Zezzi Arruda (✉) · L. T. Kubota
Universidade Estadual de Campinas, UNICAMP, Institute of Chemistry, Cidade Universitária Zeferino Vaz, s/n, P.O. Box 6154, 13083-970 Campinas, SP, Brazil
e-mail: zezzi@iqm.unicamp.br

Marco Aurélio Zezzi Arruda

is a Full Professor at the University of Campinas – Unicamp (Campinas, Brazil), Department of Analytical Chemistry, and a member of the National Institute of Science and Technology - INCT for Bioanalytics. His current research interests include transdisciplinary work involving comparative omics of plants (i.e., soybean, sunflower) and human body fluids (i.e., blood serum, urine) to identify possible biomarkers for transgenic species and human diseases, as well as to evaluate reactive

oxygen species production and (metallo)protein responses under stress in a given system. He is the author or co-author of over 140 research articles, seven book chapters, and holds five patents, is on the editorial staff or advisory board of Analytical and Bioanalytical Chemistry, Metallomics, Journal of Integrated Omics, and Brazilian Journal of Analytical Chemistry. He is a member of the advisory board of the Brazilian Mass Spectrometry Society (BrMASS) and the Brazilian Chemistry Association (ABQ).

Lauro Tatsuo Kubota

is a Full Professor in the Analytical Chemistry Department of the Institute of Chemistry at Universidade Estadual de Campinas. He has been a member of the Brazilian Academy of Science since 2010. He is the coordinator of the Instituto Nacional de Ciência e Tecnologia de Bioanalítica (INCTBio). The INCTBio is an institute with 35 laboratories working in bioanalysis, working together to develop analytical methods related to the biological, forensic, and medical purposes. He

has published more than 280 papers in international journals, supervised 26 PhD students and 17 post-docs. His current research interests focus on the development of electrochemical sensors, biosensors, and bioanalytical methods, mainly directed to point-of-care devices, with the purpose of using them in the field of agriculture and clinical diagnosis.