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EDITORIAL

Analytical nanoscience and nanotechnology: a topical collection in honor of Prof. Miguel Valcárcel

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About a year ago, Professor Miguel Valcárcel passed away. From the outset, *Analytical and Bioanalytical Chemistry* made the decision to publish a topical collection in tribute to such an internationally renowned scientist and analytical chemist (Fig. 1). Undoubtedly, it is a well-deserved recognition for someone who has been an example, master, and guide for so many scientists and university professors worldwide.

His legacy is impressive, as are his merits and achievements. Perhaps the most important thing is that he knew how to converge academia with research, management, and leadership in his professional life. It is not often for a university professor to stand out in all these aspects.

He was a magnificent teacher, with a continuous effort to update the didactic contents and introduce innovations in the teaching-learning process, even involving his students in the co-authorship of one of his 9 published textbooks. He was rigorous and serious, but very loved and appreciated by his students. He also highlighted his teaching activity in master's degrees and postgraduate courses, many of them organized under his direction (national and international). He also trained a significant number of current university professors and research staff (75 doctoral thesis directed).

His research work has been enormous and difficult to summarize due to its diversity, extension, and scientific production, without neglecting the transfer of knowledge to society and the productive world. He was the author/coauthor of about 1000 scientific articles, a long list of plenaries, and invited conferences of different natures at national and international scientific events, 11 invention patents, and the direction of more than thirty national and international research projects, as well as 11 scientific monographs and a wide list of book chapters in this type of publication. Innovation and creativity characterized his research career, from his beginnings in the doctoral thesis that he defended at the University of Seville in 1971 on photometric analytical methods, later incorporating kinetic aspects, to later turn to more avant-garde topics, of which he pioneered, such as automation (flow systems), miniaturization, simplification of chemical measurement processes, and development of metrology in qualitative methods, including screening and vanguard–rearguard analytical systems, and more recently analytical nanoscience and nanotechnology. He also knew how to stimulate, not only his own research group, but also other national groups, towards a more innovative and competitive analytical chemistry, not only at the national level, but also with an international projection that is recognized today.

Prof. Valcárcel contributed decisively to the modernization of analytical chemistry, both in the claim of its foundations and basic principles and in its important applied facet and its role to problem solving. He incorporated multidisciplinary and internationalization and underlined its social impact, as well as the social responsibility that analytical chemistry and those of us who work in this discipline must have.

In addition to having held many positions of responsibility in national chemistry and university management, he also stands out as belonging to the Working Party of the Analytical Division of the European Federation of Chemical Societies for many years, being the chairman between 1999 and 2005. He was a representative of the Spanish Government in the Management Committee of the BCR Program of the European Union on "Tests and Measurements" and a

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In honor of Prof. Miguel Valcárcel.

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Fig. 1 Photography of Prof. Miguel Valcárcel (**a**) and tribute to his doctoral students on his retirement in 2016 (University of Cordoba, Spain) (**b**)

member of the "High-Level Expert Group" of the Growth Program (2001–2003). All this career could not be exempt from numerous prizes and distinctions, both at a national level (Maimónides Prize for Scientific and Technical Research from the Junta de Andalucía in 1992, "Solvay" Chemical Sciences Research Prize from the CEOE Foundation in 1997, Enrique Moles National Chemistry Prize in 2005, "Averroes Gold Medal Award" to a scientific career in 2006) and internationally (Enric Planquette of the Austrian Chemical Society in 1996, Gold Medal of the University of Warsaw in 2000, Portuguese Chemical Society Award in 2000, DAC-EuCheMS Award of the European Association of Chemical Sciences in 2015, and the Robert Boyle Medal of the Analytical Division of the Royal Society of Chemistry of Great Britain in 2004). He was named Numerary Academician of the Royal Academy of Exact, Physical and Natural Sciences of Madrid in 2010, and was elected Doctor Honoris Causa by the University of Valencia in 2011. Table 1 summarizes some of the international scientific activities of Prof. Valcárcel.

With all this activity and these important milestones, Prof. Valcárcel lived with intensity and hyperactivity and with passion and enthusiasm that he transmitted to everyone around him.

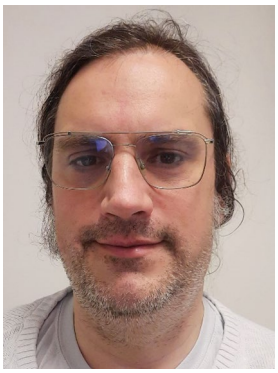
Analytical nanoscience and nanotechnology (AN&N) is a clear trend in current analytical chemistry in which Prof. Valcárcel was working during his last research period. This was the reason to select the subject of this topical collection in honor to him. This discipline has had a deep impact in analytical chemistry from two points of view: (i) the use of nanomaterials as nanotools involved in any of the main steps of analytical process and (ii) the need to obtain analytical information about the nanoworld (characterization of nanomaterials and the application of the analytical nanometrology). Both attractive scientific and technical objectives have been covered by the articles reported in this issue.

The guest editors would like to acknowledge the contributions of all authors who participated in this topical collection. The published articles are good examples of recent developments and interesting analytical applications in this very active field of current research. We are also grateful to the Editorial Office and Editors for their assistance and support. We are sure of the valuable source of information for *Analytical and Bioanalytical Chemistry* readers.

Table 1 Some of Prof. Valcárcel's international scientific offices

- ***Chairman of the Division of Analytical Chemistry of the Federation of European Chemical Societies (1998–2005).***
- ***Member of the Study Group on "Education" of the DAC-FECS during ten years.***
- ***Spain's representative in the Management Committee of the European Union's SMT Programme (BCR) (1988–1995).***
- ***Member of the High-Level Expert Group of the Growth Program (European Union) (1999–2003).***
- ***Member of the Executive Committee of EURACHEM (1982-1999).***
- ***Contributing Editor of the journal Trends in Analytical Chemistry since 1999.***
- ***Associate Editor of the "Encyclopedia of Analytical Chemistry" (2008-2016).***
- ***Member of the Editorial Board of the scientific journals: The Analyst (RSC), Talanta (Elsevier), Analusis (Elsevier), Analytical and Bioanalytical Chemistry (Springer).***
- ***Member of the jury of the Merck International Award in 1998, 2000, 2002, 2004, 2007 and 2009.***
- ***Member of IUPAC's Commission V (1988–1994).***

Ángel Ríos is Full Professor of Analytical Chemistry in the Department of Analytical Chemistry and Food Technology at the University of Castilla – La Mancha, in Ciudad Real (Spain). His current research interest is centered on the development of simplified and miniaturized analytical systems, especially involving analytical nanoscience and nanotechnology as nanotools in analytical processes and new strategics in analytical nanometrology. He has coauthored about 350 articles in scientific journals, 4 international books, 7 book chapters, and 8 patents. He is the current coordinator of the Doctorate Program in Chemistry at his university, where he has been the supervisor of 30 PhD theses and the head of the analytical nano-group.



Wolfgang J. Parak is Full Professor at the University of Hamburg. He studied physics and obtained his PhD in Munich. After a postdoctoral fellowship at Berkeley, he returned in 2003 to Munich to start his own group. Before moving to the University of Hamburg in 2017, he spent 10 years as Professor at the Philipps University Marburg. His research is dedicated towards the development of new surface chemistries of inorganic nanoparticles and towards the characterization of their physicochemical properties. In particular, the development of an amphiphilic polymer coating is nowadays used by many different groups worldwide. Nanoparticles with such high colloidal stability are the bases of experimentally correlating their physicochemical properties with their interaction with cells (involving uptake and cytotoxicity), which has been the research topic of the Parak Group for the past two decades. The group also uses polymeric polyelectrolyte capsules fabricated by layer-by-layer assembly for biological applications (in vitro sensing and delivery).