

INTERVIEW



Professor Patricia Smichowski, a researcher who works hard to contribute to science, kindly granted BrJAC an interview

Patricia Smichowski^{ID} is a Licentiate in Chemistry (equivalent to a Master in Science) of the University of Buenos Aires. She obtained an MS in Nuclear Engineering from the Engineering School of the University of Buenos Aires in 1981 and received her Ph.D. in chemistry in 1995 from the Complutense University, Madrid, Spain. In 1982, she joined the Argentine Atomic Energy Commission (CNEA) where she is currently Head of the Analytical Developments Division. She is also Principal Researcher at the National Council of Scientific and Technical Research (CONICET). She specializes in the development and application of atomic spectrometric techniques to environmental and biological analysis. Her interests lie in the preconcentration, speciation, and determination of trace metals and metalloids in a variety of matrices by employing plasma-based techniques, atomic fluorescence spectrometry, and other coupled techniques.

She has conducted national and international projects aimed at characterizing the presence of metals, metalloids, ions, and organic compounds in airborne particulate matter, as well as elucidating their origin. She holds a patent, with other researchers, relating to the development of a sorbent for arsenic retention.

Patricia Smichowski has published 130 peer reviewed articles and 12 book chapters, given 45 invited lectures at international meetings, and has co-organized several international conferences. She is a member of the advisory board of four international analytical chemistry journals, as well as the European Virtual Institute for Speciation Analysis.

How was your childhood?

I had a happy childhood in the province of Buenos Aires, Argentina where I was born. I lived a very happy family life. My parents always supported me in my pursuits, and they were a great support throughout my life.

What early influences encouraged you to study chemistry? Did you have any influencers, such as a teacher?

As a child, I wanted to be an architect (today my daughter is an architect) until the age of 16, when I had an excellent chemistry teacher who made me discover the wonderful world of chemistry. At that time I thought “chemistry is very easy”; today, I don’t think the same!!!

How was the beginning of your career in chemistry?

During my high school years, I already wanted to be a chemist. In 1980, I obtained a degree in Chemistry (equivalent to a Master in Science) from the University of Buenos Aires, Argentina. Several years later,

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I obtained my Ph.D. in Chemistry at the Complutense University of Madrid under the supervision of Dr. Carmen Cámara, who was, and still is, a great friend.

What has changed in your profile, ambitions, and performance since the time you started your career?

Many things have changed because science, research, and life have changed during all these years. What hasn't changed for me is that, if I had to start over, I would do exactly the same. I have come a long way and I have had many satisfactions. Analytical chemistry is an exciting part of my scientific life.

Could you comment briefly on the recent evolution of analytical chemistry, considering your contributions?

Analytical chemistry and spectrochemical analysis have evolved and, consequently, have changed and improved significantly. These changes have gone in hand with instrumental development that has made it possible for analytical chemists to determine lower and lower concentrations, determine inorganic and organic species of the same element, combine separation and quantification techniques, and develop methods framed in the precepts of green chemistry. The advances made in the design and application of nanomaterials, biosensors, electroanalytical, sample introduction methods, chemometrics, and imaging techniques provide clear evidence of the impact of analytical chemistry in different research areas.

What are your lines of research? You have published many scientific papers. Would you highlight any?

I have two main lines of research: *i)* development of analytical methods that allow the preconcentration, speciation, and determination of metals and metalloids at trace and ultra-trace levels using a variety of analytical techniques and instrumental couplings; *ii)* Characterization of atmospheric particles and related matrices, identifying the presence of metals, metalloids, ions, and organic compounds, as well as the identification of their sources.

In the last 20 years, I have worked very actively in environmental analytical chemistry and I am very satisfied with the work carried out and with the contributions that I and my group have made to this discipline.

What is your opinion about the current progress of chemistry research in Brazil? What are the recent advances and challenges in scientific research in Brazil?

Brazil is a huge country with great potential. My first visit to Brazil was in the 90s and, since then, I have seen more and more research growing in quality and quantity. Today, we can say that there are many groups that carry out top level research and that these research groups are competitive with the most internationally recognized researchers.

For you, what have been the most important recent achievements in analytical chemistry research? What are the landmarks? What has changed in this scenario with the COVID-19 pandemic?

In my opinion, instrumental developments, especially in mass spectrometry, have opened new fields of research, especially in trace element analysis and -omics in biochemistry and environmental chemistry.

The COVID-19 pandemic has caused a worldwide backlog, as experimental work could not be done for a long period. On the other hand, I want to remark that diagnostic tests developed during the pandemic represented an important contribution to making appropriate clinical decisions in short periods of time.

There are, in Brazil and in the world, several conferences on chemistry. To you, how important are these meetings to the chemistry scientific community? How do you see the development of national chemistry meetings in Brazil?

Conferences are an important meeting point between scientists, students, and vendors. As Brazil is a very large country, conferences in Brazil attract a large number of people. This impresses me in particular

and I find it very positive. The only criticism I make, to Brazil in particular and other countries in general, is the excessive number of conferences, often with some overlapping of topics.

What is the importance of awards for the development of science and new technologies?

Awards are always important for seniors and for young people. They are a recognition to effort and dedication; recognition is a powerful incentive to stimulate quality work.

For you, what is the importance of the national funding agencies for the scientific development of Brazil?

All over the world, funding agencies play a fundamental role in making it possible to carry out quality research that will contribute over time to the continuous development of the country. Without the help of these agencies, it is impossible to carry out sustained research.

At the moment, the situation for scientific research in Brazil is one of decreasing investment. How do you see this situation, and what would you say to young researchers?

...there is a relatively small number of scientists in South America compared to other regions of the world. In this context, added to the decrease in funding, cooperation between different research groups in the region is crucial to maintain the scientific level that we have achieved with great effort.

This is a situation that occurs in Brazil and in many other countries. To young people, I say not to be discouraged and to continue working hard to achieve their dreams. In addition, there is a relatively small number of scientists in South America compared to other regions of the world. In this context, added to the decrease in funding, cooperation between different research groups in the region is crucial to maintain the scientific level that we have achieved with great effort.

What advice would you give to a young scientist who wants to pursue a career in chemistry?

Young scientists bring new energies and perspectives to analytical chemistry research. I would advise them to be good students, to engage in research activities, and to have an active participation in workshops and conferences to be in contact with professors and researchers from Brazil and other parts of the world. An important point to highlight is to enjoy every step of their careers. Briefly, the most important thing is to be happy with what you are doing.

For what would you like to be remembered?

I would like to be remembered as an Argentine researcher who has worked hard for many years and who has made a contribution to science.