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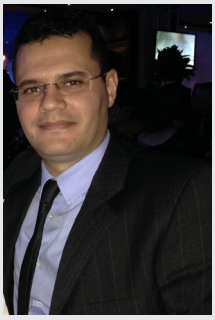
INTERVIEW



Professor César Ricardo Teixeira Tarley, a young researcher with a distinguished and internationally recognized career, kindly gave an interview to BrJAC

César Ricardo Teixeira Tarley is Full Professor at the Department of Chemistry of the State University of Londrina (UEL, PR, Brazil), Research Productivity Fellow of the National Council for Scientific and Technological Development (CNPq) since 2007, has a Bachelor's degree in Chemistry from the State University of Maringá (UEM, PR, Brazil) (1998), a Master's Degree in Applied Chemistry from UEM (2001), a Doctorate in Natural Sciences (Analytical Chemistry) from the State University of Campinas (UNICAMP, SP, Brazil) (2004), and a postdoctoral fellowship in Analytical Chemistry from UNICAMP (2005) under the supervision of Prof. Lauro Tatsuo. Since 2019, Dr. Tarley has been considered one of the most influential researchers in the world (Plos Biology – https://doi.org/10.1371/journal.pbio.3000918) and among the top chemists in Brazil (research.com) in the 2022 and 2023 rankings. He was an Associate Professor at the Federal University of Alfenas (UNIFAL, MG, Brazil) (2005-2009) and at the Federal University of Uberlândia (UFU, MG, Brazil) (2009-2010). From 2006 to 2009, he was a member of the Board of Directors of the Master's Degree Programs in Chemistry and Pharmaceutical Sciences at UNIFAL, a member of the Board of Directors of the Doctoral Program in Chemistry associated with UEL, Central-Western State University (UNICENTRO) and Ponta Grossa State University (UEPG). Dr. Tarley was also a member of the Advisory Committee of the Research Promotion Foundation of the State of Minas Gerais (FAPEMIG) in 2009, Vice Head (2014-2016) and Head of the Chemistry Department at UEL (2016-2018), Representative of the Central Committee for Extension (CCE) in the Ethics Committee for Research with Human Subjects at UEL (2015), Member of the Committee of the Program of Innovation and Information Technology (PROITI) (2015-2018), Member of the Committee of the Program of Scientific Initiation (ProIC) (2018-2019), Vice Coordinator of the Exact Sciences Advisory Committee of the Araucária Foundation (2017-2019), Coordinator of the UEL Chemistry Graduate Program (2019-2021), Vice Secretary of the Regional Brazilian Chemical Society in the State of Paraná (2021-2022), Consultant of the Coordination for the Improvement of Higher Education Personnel (CAPES) (2017-2020). He is a Full Professor of Analytical Chemistry at the State University of Londrina (UEL), Coordinator of the Advisory Committee for the Exact Sciences Area of the Araucária Foundation, and supervises undergraduate, master's, and doctoral students in chemistry. He is also a permanent professor in the Postgraduate Program in Pharmaceutical Sciences and Food Science. He has been a coordinator and/or member of research projects financed by funding agencies (CNPq, Araucária Foundation of Paraná, FAPEMIG, CAPES, FINEP, and INCT-Bio). Dr. Tarley has experience in chemistry working on the following topics: development of chromatographic methodologies for the determination of contaminants and

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toxicants in food and pharmaceutical samples; development of electroanalytical methodologies for the determination of compounds of forensic, environmental, food, and clinical interest; and development of analytical methodologies for the determination of metals and micronutrients in food and environmental samples by atomic spectrometric techniques. Emphasis is placed on the use of chemically imprinted polymers and nanomaterials and liquid-liquid microextraction methods in method development. Dr. Tarley has published more than 260 scientific papers in international and national journals, has an h-index of 41 in ISI and 42 in Scopus, and more than 5942 citations in Web of Science and 6670 in Scopus. He has supervised 75 undergraduate students, 30 master's students, and 21 Ph.D. students, and has supervised 5 postdoctoral fellows.

BrJAC: How was your childhood?
Prof. Tarley: I am a son of self-employed parents – my father was a truck driver, and my mother was a merchant (in memoriam). At 8 years old, I was already working in a coffee cooperative manufacturing coffee baskets. At 10 years old, I worked as a delivery boy for one year. At 12 years old up to 17 years old, I worked with my mother in a clothing store. Since I had to work during the day, I studied accounting at night in high school. It was a difficult time because to be approved for the university application, I had to borrow books from the Museum of Parapuã City and study on the weekends.

BrJAC: What early influences encouraged you to study chemistry? Did you have any influencers, such as a teacher?
Prof. Tarley: I clearly remember the teacher teaching about the atom in elementary school, in the eighth grade. Coincidentally or not, I did my PhD in atomic spectrometry. The Civil Engineering course was my first choice for a university course, but my application was not approved. Therefore, I opted for Chemistry at the State University of Maringá. Although it was a tough course, it was a turning point in my life, as I always liked studying and making discoveries. Chemistry provides this for us.

BrJAC: How was the beginning of your career in chemistry?
Prof. Tarley: After finishing my postdoctorate in 2004 at Unicamp, I applied for a public contest for an Analytical Chemistry Adjunct Professor role at Unifal-MG. I worked in this role from 2005 until 2009. Through another public contest, I was transferred to UFU in 2010 and then to UEL, where I am a Full Professor. At Unifal-MG, I initiated the guide for scientific initiation and graduate students; I also had the opportunity to participate in the creation of new undergraduate and graduate courses, and administrative activities.

BrJAC: What has changed in your profile, ambitions, and performance since the time you started your career?
Prof. Tarley: I hold a master's degree in gas chromatography, a doctorate degree in atomic spectrometry, and a postdoctoral in electroanalytics. Due to my graduate training subject, I have been working in different areas of Analytical Chemistry with emphasis on material synthesis, especially chemically imprinted polymers, and the development of preconcentration methods, electrochemical sensors, and liquid-liquid microextraction methods. From my point of view, the Analytical Chemist must be a versatile professional with extensive knowledge to develop and improve analytical methods.

BrJAC: Could you comment briefly on the recent evolution of analytical chemistry, considering your contributions?
Prof. Tarley: Over the years, Analytical Chemistry has evolved and contributed to solving different analytical challenges that directly impact the population and the production field. It is possible to mention the advent of sample preparation methods, chemometrics, chromatographic methods, miniaturized analytical

systems based on microfluidics, and electrochemical sensors, among others. In this context, I especially contributed to the development of new analytical methods. In 2004, at the beginning of my postdoctorate, after an exhaustive review of the literature, I found that no research group in Brazil carried out studies with molecularly imprinted polymers. My main contribution is based on the synthesis and use of these polymers in the development of preconcentration methods and electrochemical sensors. I have published more than 80 scientific papers in this field to date.

BrJAC: What are your lines of research? You have published many scientific papers. Would you highlight any?
Prof. Tarley: My line of research focuses on the development of chromatographic, electroanalytical, and electroanalytical methodologies to determine substances of forensic, environmental, food, and clinical interest. The emphasis is the use of chemically imprinted polymers and nanomaterials for preconcentration and sensor modification, as well as liquid-liquid microextraction methods for methodology development. The highlight is not just polymer use but the study of new polymer synthesis routes to obtain materials with superior selectivity and sensitivity. These studies resulted in the filing of some patents.

BrJAC: 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?
Prof. Tarley: Analytical Chemistry carried out in Brazil is of a high level, comparable to large research hubs around the world. Most Analytical Chemistry fields have researchers who stand out on the world stage, carrying out high-quality research in sample preparation, methods based on microfluidic devices, analytical devices based on 3D printing, point-of-care devices, chemometric methods, ohmic studies, and instrumentation development.

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BrJAC: 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?
Prof. Tarley: Analytical Chemistry has been meeting the demands of chemical analysis in different areas for years. From my point of view, Analytical Chemistry reaches its purpose when the development of analytical methods and/or use of analytical tools leaves the walls of universities and research centers and becomes technologies with practical applications. In this sense, examples of recent achievements in Analytical Chemistry are routine analytical devices, especially point-of-care ones, screening methods based on chemometrics, portable electrochemical sensors used in forensic chemistry, and proteomic and metabolomic studies. Considering the COVID-19 pandemic, despite the development of different sensors for detecting the virus, I believe that Analytical Chemistry could be more proactive in anticipating new devices for detecting new virus variants that may emerge.

BrJAC: There are, in Brazil and the world, several conferences on chemistry. To you, how important are these meetings to the scientific chemistry community? How do you see the development of national chemistry meetings in Brazil?
Prof. Tarley: Conferences are essential for exchanging experiences between professors, technicians, and undergraduate and graduate students, as well as for establishing scientific partnerships. In Brazil, traditional congresses such as the Meeting of the Brazilian Chemical Society, the National Meeting of Analytical Chemistry, the Brazilian Symposium on Electrochemistry and Electroanalytics, and the Brazilian Meeting on Chemical Speciation are examples of success.

BrJAC: What is the importance of awards for the development of science and new technologies?
Prof. Tarley: Without a question, the recognition of the science and technology work provides encouragement to the researcher and contributes to more comprehensive dissemination of science in the media.

BrJAC: For you, what is the importance of the national funding agencies for the scientific development of Brazil?
Prof. Tarley: The foundation of developed countries is based on high-quality education and scientific and technological independence. The lack of large-scale investments through development agencies would negatively impact human resources training and lead to technological obsolescence. However, financial resources through partnerships between universities and the production sector are also welcome since they can promote the solution of real problems more quickly, leading to the well-being of the population.

BrJAC: 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?
Prof. Tarley: It is a very worrying situation since most of the Brazilian research is carried out by graduate students. It is necessary to increase the rating and number of scholarships. Graduate students should have rights and duties like any other working condition, and the essential infrastructure needed to carry out research should be provided. To young researchers, I recommend they prioritize human resource training and knowledge building throughout their careers, although the demands for scientific production are tough.

BrJAC: What advice would you give to a young scientist who wants to pursue a career in chemistry?
Prof. Tarley: It's a beautiful career that allows constant learning, considering either the production sector or the education and research field. Therefore, have a critical sense and be enthusiastic to produce more and more.

BrJAC: For what would you like to be remembered?
Prof. Tarley: Professionally, I would like to be recalled as a good teacher and a researcher concerned with human resource training; a teacher who works hard and demands excellent work from his students. When it comes to personal life, I would like to be remembered as a good son, a good father, and a good husband.