

## Professor Julio Alvarez-Builla

### A Tribute



**Dedicated to Professor Julio Alvarez-Builla on the occasion of his 65<sup>th</sup> birthday**

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Julio Alvarez-Builla was born in Madrid on January 11, 1946. He studied Pharmacy at the Complutense University of Madrid (UCM) where he graduated in 1971. He was attracted by the role of organic chemistry in the development of drugs and embarked on a research programme under the supervision of Professor Gregorio Gonzalez Trigo. He obtained his Ph.D. degree in 1976 from the Department of Organic Chemistry within the Faculty of Pharmacy (UCM) working on the synthesis of natural alkaloid analogues, and his thesis was recognized with a Doctorate Special Award. In 1978 he joined the group led by Professor Alan R. Katritzky at the University of East Anglia (UK), where he spent two years as a postdoctoral fellow. This experience was particularly significant in shaping his future research in the field of heterocyclic chemistry.

Julio returned in 1980 to the Complutense University for a short time, and in 1981 he was appointed as Lecturer in the Department of Organic Chemistry at the University of Alcalá (UAH), a historical university recently reopened at the time in Alcalá de Henares, 30 km away from Madrid. He was promoted to Full Professor at the same university in 1993.

The initial years at the UAH were challenging. Although the University of Alcalá had been considered a centre of academic excellence in Spain throughout the sixteenth to eighteenth

centuries, in the mid-nineteenth century the university was moved to Madrid and only reopened in 1977. There was no tradition of chemistry or pharmacy and Julio and other colleagues worked with great tenacity in establishing research laboratories, in securing funding and in the creation of dynamic research groups.

Julio was also concerned about the role that academic public research should play in relation to private industry and he enthusiastically promoted collaboration with chemical and pharmaceutical companies in order to develop joint projects in a variety of fields. His main achievement in the context of applied research was the creation of the Pilot Plant for Fine Chemicals (PPFC) on the science campus of the University of Alcalá, a team project in which he worked with dedication for almost seven years, followed by a further ten supervising the scientific direction of the facility. The PPFC is recognized today as a centre of excellence in the development of research projects in close collaboration with national and multinational chemical and pharmaceutical companies.

Most of Julio's research interests have been concerned with heterocyclic chemistry, particularly the synthesis and chemistry of new heteroaromatic systems that contain quaternary nitrogen and heterocyclic systems with biological activity. Julio's early work in the 1980s focused on the chemistry of azinium and quinolizinium salts. His interest in the latter cationic heterocyclic system is well exemplified by his contribution in exploring the potential of the Westphal reaction for the synthesis of numerous quinolizinium- and azaquinolizinium-type heterocycles. The study of the regioselectivity of this reaction, along with its successful intramolecular and solid phase versions were landmarks in the chemistry of these charged heterocycles. Work on these heterocycles continued throughout the 2000s and led to new synthetic strategies that encompassed the metathesis reaction and new functionalization procedures, involving the use of palladium-promoted reactions.

In the 1990s, Julio's interest in heterocyclic chemistry moved from charged heterocycles to heterobetainic systems. These studies, from the beginning through to the present day, covered a number of new heterobetaines – particularly azinium-*N*-(2'-aziny)aminides-, which have been employed in a variety of efficient heterocyclic syntheses also involving some radical chemistry.

One of his major interests over the years has been in the area of the emergent synthetic techniques. He was a pioneer in the use of techniques such as ultrasound, phase transfer catalysis and microwave synthesis (I remember how excited he was after reading the pioneering work by Richard Gedye and *col.* on the use of microwaves and how he appeared days later in the lab with a domestic microwave oven in hands, encouraging everyone in the group to use it) applied to the preparation and reactivity of different heterocycles such as isoquinolines, dihydropyridines, carbolines, benzothiazepines, imidazopyridines and isoindoles, *inter alia*.

Julio is a pharmaceutical chemist who loves heterocyclic chemistry and from the very beginning of his involvement in research he understood the potential of heterocycles in the world of drugs. He understood that the vast field of heterocyclic chemistry is of immense importance in the search for new biologically active compounds. A significant amount of his academic productivity (180 scientific papers) and practically all his collaborations with pharmaceutical

companies, represented by around 80 joint projects, have been devoted to the exploration of biological activity in a variety of heterocycles. His contributions are reflected in numerous articles and, in particular, in the 40 patents dealing with antihypertensive, antitumour, antibacterial, analgesic and neuroprotective agents as well as with phosphodiesterase, elastase and 5-lipoxygenase inhibitors.

Apart from his achievements as researcher, Julio is also a motivated teacher. He has been happy teaching heterocyclic and medicinal chemistry for more than 30 years and has supervised 25 Ph.D. students. Julio also promoted the concept of a Interuniversity Doctorate in Medicinal Chemistry and acts as Director of this programme.

He served the University of Alcalá as Vice-rector for Research (1995–98), Vice-rector for Scientific and Technological Development (1998–2000) and Dean of the Faculty of Pharmacy (2009 to present), and contributed to the Spanish chemical community at local, regional and national levels on Boards and Committees. Julio has been awarded the COFARES Prize by the Spanish Royal Academy of Pharmacy (1982), the Alcalá University Prize for Research (2001) and the Innovation Medal from the Garcia Cabrerizo Foundation (2009).

Julio is married to Charo and they have two sons – Jorge, an architect, and Miguel, an economist. He is an avid reader of historical and scientific novels and enjoys going to the cinema, skiing and sharing wine and dinner with friends. Julio also enjoys visiting the seaside in the south of Spain and has a curiosity for nature (although it must be said that his knowledge of the latter field is nowhere near as extensive as his knowledge of chemistry). For any appointment with Julio I would recommend choosing a comfortable place to meet, a fine activity for the waiting time, and being patient....he will eventually appear.

Julio has been my research mentor, colleague and friend and I feel fortunate to have had the opportunity to work with him in research and teaching since I met him in the early 1980s.

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