

## Profesor Kilian Muñiz (1970-2020)

### *In memoriam*

It is with great sadness that we have received note of the sudden death of professor Kilian Muñiz. He passed away on the evening of March 16th, aged 49. With him, the chemistry community has lost an outstanding scientist, a highly regarded colleague, respected mentor, and, most of all, a dear friend.

Kilian Muñiz was born in 1970 and spent his childhood in Hildesheim, Germany. Later he went to study at the University of Hannover. A short-term stay at Imperial College and a joint Diploma research project in the groups of Prof. H. M. R. Hoffmann and Prof. José Barluenga at the University of Oviedo then led to long-lasting friendships with Prof. Sue Gibson and the Barluenga family. In the years 1996-1998 he then carried out his doctoral research in the group of Prof. Carsten Bolm at RWTH Aachen University where he developed asymmetric diarylzinc additions to aldehydes. Afterwards, he was given the chance to carry out a postdoctoral stay with Prof. Ryoji Noyori (1999-2000), whom he greatly admired as a scientist and who received the Nobel prize shortly afterwards. During that time Kilian worked on new bifunctional ruthenium diamine catalysts for asymmetric hydrogenations and the underlying mechanistic details. Knowing that he would pursue an independent career, these experiences fueled his ambition to take on challenging problems in transition metal catalysis. As the first step in his independent career, he therefore decided to solve the problem of a catalytic diamination reaction, the direct addition of two nitrogen-containing groups to an olefin. Stoichiometric thallium-, mercury-, palladium- and selenium-mediated diamination reactions had been published in the 70s and 80s by Barluenga, Bäckvall, Sharpless and others, but a catalytic variant had remained elusive. At Bonn University and with Prof. Dötz as his mentor, he began to investigate the potential of a thallium-catalyzed diamination, which eventually failed due to the strong oxidation power that was required to reoxidize thallium(I) to thallium(III) for closing the catalytic cycle. Next, he pursued an osmium catalyzed diamination in analogy to the Sharpless dihydroxylation and aminohydroxylation reactions, which led to beautiful stoichiometric studies on the mechanism and the selectivity of diaminations with imidoosmium reagents. The breakthrough was then achieved in form of an intramolecular diamination under palladium catalysis with a hypervalent iodine oxidant. The rest is history and numerous advancements in palladium-, nickel-, gold-, and even bromide-catalyzed diamination reactions followed.



After the exciting time at Bonn University, Kilian was appointed assistant professor at Strasbourg University in 2005, promoted to full professor in 2006, and shortly afterwards moved with his group to ICIQ, Tarragona in 2009. During this time, his lab successfully developed asymmetric diaminations under palladium and hypervalent iodine catalysis. Besides diamination and hypervalent iodine chemistry, Kilian became known for catalytic C-H amination and N-H activation reactions as well as the general concept of high oxidation state catalysis. All of these are topical research areas to which his lab made major contributions.

Needless to say, his efforts were acknowledged by many awards, for example the Liebig Fellowship, the ADUC-prize for habilitands, a Chaire d'Excellence, a junior membership of the Institute Universitaire de France, the ICREA Research Professorship, the RSEQ Prize for Scientific Excellence and the Yoshida Lectureship. Kilian's laboratory has been very successful to date with more than 140 publications.

Overall, the legacy of Kilian Muñiz is a fundus of unconventional and highly original chemistry that made a strong and long-lasting impact to the field of organic chemistry. At times where whole research areas grow rapidly and changes occur within months or even weeks, he was able to address a tough problem of catalysis in a journey that lasted over a decade. It is this unconditional passion, his persistence, and his great chemical intuition that made Kilian such a unique and successful chemist who was often ahead of time.

Personally, I admire Kilian's aim for tough challenges and his search for new reactivity. Together with his passion for chemistry, it inspired me to pursue an academic career myself. I still remember talking to him after one of his

classes about my own future when I was a student. Being undecided whether I should pursue a diploma in organic or physical chemistry, it took him less than two minutes to convince me to join his group. From this moment on, he has been a mentor and friend to me. Until recently, Kilian remained active in the lab and took the time to lay hands on a reaction himself. He was an excellent teacher with a unique personality and he always supported his students and group members. Kilian enjoyed life, good Mediterranean and Japanese food, sidra, and a good red wine. Besides his passion for chemistry, he loved collecting first editions of books, written and hand-signed by famous scientists and writers. At our time in Bonn and Strasbourg, besides chemistry, we often had chats over a coffee, were talking about the world and politics, were playing cards, or just having a good time. The soccer matches against the Dötz and Gansäuer groups in front of the chemistry building in Bonn as well as Kilian's support for the FC Bayern Munich soccer club were legendary. This time in Bonn led to another long-lasting friendship between Kilian and Prof. Andreas Gansäuer.

Kilian's death comes totally unexpected to all of us and at the peak of a scientific career that could easily have lasted for two more decades. His group members, colleagues, friends, and family are now facing a great loss and uncertainty. Our condolences are with them and we remain speechless, deeply shaken by his passing.

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Conocí a Kilian en Estrasburgo en 2007 cuando, durante una invitación a dar una charla en la Université Louis Pasteur, visité su laboratorio y cenamos juntos. Yo le hablé con entusiasmo del ICIQ en Tarragona. El año siguiente le invité como conferenciante en nuestra Summer School y en 2009, nuestro Director, Miquel Pericàs, le invitó a unirse al equipo de investigadores del ICIQ. Desde entonces, Kilian ha sido uno de mis vecinos de planta y hemos compartido muchos buenos momentos. Kilian era a veces gruñón, casi siempre exagerado, con un humor difícil de entender que él calificaba como humor alemán, pero, a la vez, un gran apasionado de la química, de la que tenía un conocimiento tanto profundo como enciclopédico. No exagero diciendo que era imbatible en su conocimiento de los fundamentos de la química orgánica.

Kilian tenía una enorme capacidad de trabajo y un altísimo nivel de auto exigencia. Apreciaba el talento y la originalidad tanto como disfrutaba de un buen vino o de la literatura. Los que le conocimos bien, por encima de esa capa superficial de cascarrabias, sabíamos que tenía un gran corazón y que era el mejor de los colegas, con el que siempre podíamos contar. Con esta muerte tan prematura hemos perdido a uno de los mejores de su generación, a un científico de raza que estaba llamado a dejar huella en la química a nivel internacional. En el ICIQ y en la química orgánica española hemos perdido también a un gran amigo.

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