A Personal Perspective

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It is an honor, indeed, to pay tribute to the memory of Julio López-Gorgé, an imaginative plant biochemist and proud son of Spain. Julio’s contributions to science have recently been elegantly summarized. In this brief account, I describe the key role he played in fostering new research fields.

I first met Julio in 1981—the year Pierre Gadal and I organized the inaugural International Conference on Thioredoxins in Berkeley. Accompanied by his charming wife, Ana Chueca, Julio gave a poster presentation on chloroplast fructose bisphosphatase (FBPase) at the conference. With this, he made the first of many contributions to an area that was a fledgling at the outset, but with time developed into a vibrant field that today embraces all of biology. As the sole representatives of Spain at the Berkeley meeting, Julio and Ana helped launch this new field, now known as redox biology, on the Iberian Peninsula. Today a number of laboratories in the region focus on different aspects of redox biology. While he was engaged with the chloroplast work, I met Julio on several occasions. On two of these, he served as a gracious host in Granada, once for our whole family. In addition, Angel de la Torre, a member of the Granada group, spent a productive visit as postdoctoral scholar in our laboratory in the early 1980s.

After the Berkeley conference, Julio led a project in which he gave new insight into the properties of chloroplast FBPase with respect both to its interaction with f-type thioredoxin and its light-induced biosynthesis. This work prompted him to apply tools of molecular biology to study the problem. Again, his experiments contributed to our bank of knowledge of these two proteins that are considered fundamental to photosynthetic carbon dioxide assimilation in chloroplasts. Julio’s work also provided some of the first evidence that thioredoxins function in oxidative stress responses in plants. Julio’s young Granada colleagues have extended his work in efforts to improve the nutritional properties of foods.

The success in applying molecular biology both to chloroplasts and foods provided the background for the next chapter in Julio’s career. He was aware of the growing shortage of water in regions such as southeastern Spain. In consultation with others, he proposed the introduction of C₄ and Crassulacean acid metabolism (CAM) plants into the region. These species, that are the subject of this book, survive and, in some cases, thrive under arid conditions unable to support propagation of C₃ counterparts. Julio foresaw that land currently left fallow could be developed to cultivate crops such as sorghum to be used not only for food, but also for fuel. In this way the productivity of Spain could be invigorated and reach unforeseen highs. As with his entry in redox biology, Julio was able to look into the future and apply his talents to improve it. He was a Renaissance person not only in science but in music and the arts as well. I feel fortunate to have known him.

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