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António Xavier

Obituary

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Professor António Xavier died on May, 2006. He was born in Porto, Portugal, in August 1943. Having finished his first degree in Chemical Engineering in 1969 at the Technical University of Lisbon, he moved immediately to Oxford where, under the supervision of R.J.P. Williams, he obtained his Ph.D. in 1972 in the field of NMR using paramagnetic molecules. His pioneering work allowed the determination of the first 3D structures of biological molecules by NMR, using the geometrical constraints provided by paramagnetic metal compounds as restraints to obtain families of structures. This work provided the inspiration for later developments of biomolecular NMR techniques that nowadays allow the routine determination of the solution structure of biological macromolecules. On his return to Portugal, António directed the Molecular Biophysics Group at IST which soon became the most well-known and productive research group in Portugal. Combining biophysical and biochemical approaches, António and his collaborators contributed greatly to the unravelling of the bioenergetic metabolism of sulphate-reducing bacteria. An important facet of the interdisciplinarity of *António Xavier* was his role in the emergence of *Bioinorganic Chemistry* in the wake of the discovery and characterization of several novel metalloproteins, which now are known to be well widespread in Life. In the more recent years he devoted his attention to the structural bases for homotropic and heterotropic cooperativities observed in small multiheme cytochromes and the functional importance that may arise from positive and negative cooperativities. This knowledge allowed him, to develop structural and mechanistic models for biological electron-proton energy transduction. In particular, he proposed a very elegant model for the proton activation mechanism in the heme-copper oxygen reductases, involving positive and negative cooperativities with protic centres coupled to the redox cycle of heme *a* [1].

António's research led to more than 220 publications in major journals and he is internationally recognized due to his personal drive and commitment to science. In addition to his engagement and love for science, António devoted a great deal of his time to serving the scientific community at large. An example of this was his direct involvement in the creation of the New University of Lisbon. In this respect, one of his most outstanding achievements was his foresight in founding the Instituto de Tecnologia Química e Biológica (ITQB), placing Portuguese science at the front edge of modern scientific developments. ITQB was created as an institution where biological questions are approached in a multidisciplinary environment, always stressing what now may appear obvious, that science is only achieved by a close collaboration of multiple approaches and expertises. ITQB is presently considered one of the leading research Institutes both at the national and international level.

Those that had the privilege of knowing him personally could feel his warmth and generosity of spirit and his consuming interest in putting forward new ideas and discussing them. The scientific community has indeed suffered a great loss at his demise.

[1] Xavier, A.V. "Thermodynamic and choreographic constraints for energy transduction by cytochrome *c* oxidase", *Biochim. Biophys. Acta* 1658 (2004) 23-30.

