From urolithiasis to pathological calcifications: A journey at the interface between physics, chemistry, and medicine. A tribute to Michel Daudon

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Foreword/Avant-propos

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Foreword

Michel Daudon is a worldwide recognized biologist who performed several major breakthroughs in the field of urolithiasis. It is indeed difficult to address his outstanding personality and his great contributions to urolithiasis. Michel Daudon studied many aspects of urolithiasis, from urine crystals to kidney stone morphoconstitutional analysis. He is the author of more than 500 scientific articles on urolithiasis, and more generally on pathological calcifications, including several books and nice articles in the *New England Journal of Medicine*, *The Lancet*, *Kidney International*, among many others. Michel Daudon is not only a prolific writer; his broad fields of interests range from chemistry to biology or renal pathology, but also clinical bedside subjects explain his success and his attractive way of explaining pathophysiological processes. He has already given more than 300 lectures, in France as abroad.

Among his numerous findings, he developed 25 years ago a novel characterization and classification of kidney stones according to morphology, combined with infrared analysis, allowing one to diagnose a specific origin such as genetics, diet disorders, infections, or drug-related stones. Michel Daudon is an exemplary biologist and an example to all younger generations, as he dedicated himself to the improvement of knowledge and has been particularly involved in the training of technicians, biologists, and physicians. He has created a famous French University course dedicated to urolithiasis more than 15 years ago, and has been organizing a multidisciplinary urolithiasis congress called “Confrontations clinico-biologiques sur la lithiase urinaire” for now 20 years.

To illustrate the major findings relevant to clinical practice, we can mention the identification of calcium oxalate kidney stones with Ic morphology, assessing the diagnosis of primary hyperoxaluria type I and calcium phosphate stones with IVa2 morphology, revealing distal tubular acidosis.

Another striking point and significant example taken from his research is related to adenine phosphoribosyltransferase deficiency. This pathology is a rare autosomal recessive disorder characterized by 2,8-dihydroxyadenine crystalluria. Without treatment, the kidney function can decline and lead to end-stage renal disease. Although this pathology is almost completely ignored in other countries (less than 10 cases have been reported in the United States and in Germany), between 1978 and 2014 his laboratory identified this disease in 67 patients from 56 families: 27 pediatric cases and 40 adult cases. Many of these diagnoses were performed through the development of new infrared microscopic analyses allowing one to characterize crystalline phases in kidney biopsies.

In conclusion, for this under-recognized and treatable monogenic disease as well as for urolithiasis in general, Michel Daudon has been developing original morphoconstitutional approaches to characterize pathological calcifications.

Appendix A. Supplementary data

The comprehensive list of the publications by Michel Daudon can be found at http://dx.doi.org/10.1016/j.crci.2016.10.001.

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