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RAINER HERTEL *

A Scientist and Friend: Alessandro Ballio

I remember him as a gentleman scientist. We met 40 years ago with a straightforward experimental collaboration. His group had characterized the fungal toxin fusicoccin, its chemistry, its action; we could characterize plant membranes and binding sites. Our common paper [1] succeeded in characterizing *in vitro* binding of fusicoccin and localizing it to the plasma membranes from coleoptiles of *Zea mays* L. (At that time, a tantalizing question remained: does the ligand bind inside or outside?) – The seven authors were Ulrike Dohrmann and myself from our Freiburg lab, Pesci, Cocucci and Erasmo Marrè from Milan, and from Rome Randazzo and Sandro Ballio.

Over many years, the Ballio lab succeeded to unravel essential biochemical, molecular aspects of fusicoccin action. From these very special studies of a fungal toxin and its exogenous signalling, important features emerged concerning of its target, the H^+ -ATPase, a key enzyme for the control and the energy charge of the cell's inside versus outside. Central problems of cell biology and physiology were explored and explained [see e.g. 2].

The work by Ballio's lab and by the Marrè group in Milan also had important implications for problems concerning the action of the plant hormone auxin, the area of my own interest. Acquaintance with these fusicoccin researchers was instrumental for two curious negative conclusions which still have to make their way into the textbooks. A positive fusicoccin control could be used [3] to argue that auxin does *not* enhance elongation by lowering pH. Furthermore, it was shown [4] that fusicoccin – increasing cell wall pH outside – did not enhance auxin export. This finding certainly conflicts with the standard chemiosmotic hypothesis for auxin transport.

I met Sandro Ballio personally only after our successful experimental collaboration. I was deeply impressed by his elegance, by his fine, sensitive character, by

* Institut Biologie III, Universität Freiburg i.Br. Schänzlestr.1, D-79104 Freiburg, Germany.
E.mail: rainer.hertel@biologie.uni-freiburg.de

his *humanitas*. He certainly represented our science at its best, maintaining scientific rigor in his research and in formal and informal discussions. It was always very clear that for Sandro Ballio the human dimension of our work and our institutions was most important. And he did not preach his creed but he lived it.

Remembering him evokes the figure of an *uomo gentile*, an exemplary gentleman scientist.

LITERATURE CITED

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