

Francesco Lenci: a unique combination of top achievements in research, education and promotion in the field of photobiology

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This editorial is dedicated to Francesco Lenci on the occasion of his 67th birthday. It is certainly a great honour and a deep pleasure for me to outline Francesco's activities, as well as to comment on his achievements in the field of photobiology. Actually, for some time, I have been hesitant to accept this task owing to our warm friendship, which has now lasted for more than forty years and has steadily grown in its scientific and human aspects as a consequence of the almost spontaneous harmony of our ideas and our intensive side-by-side work to address important and challenging questions concerning the advancement of photobiology. However, an attentive reading of Francesco's CV and the unanimous statements which I collected from a number of colleagues unequivocally convinced me that the quality and far-reaching consequences of Francesco's accomplishments are above any possibility of misinterpretation or even unintentionally overstated assessments.

Graduated in physics at the University of Pisa in 1968, Francesco immediately took up his scientific career at the National Research Council (CNR) Institute of Biophysics in Pisa, where he had the

opportunity to cultivate what represented for him a particularly attractive topic, namely the effects of UV and visible light on biological systems. His dedication to this subject is witnessed by his first paper published in an international journal (*Studia Biophysica*) which appeared already in 1969. The early seventies of the previous century can be considered as a particularly fruitful era in many biological fields, including photobiology, since it marked the extensive utilization of molecular-based techniques for the interpretation of processes occurring at a cellular or subcellular level. Francesco's investigations were fully in line with this trend, as he gave significant contributions to the elucidation of energy transfer processes and photosensitized reactions involving a variety of biomolecules. This segment of Francesco's investigations is a clear demonstration of his typically interdisciplinary and experimentally accurate approach in the planning and implementation of research programmes: in many cases, his findings were reached through the concerted utilization of microscopic and spectroscopic techniques, often involving instrumentation designed or refined in-house with properties and performance tailored to

the specific system under investigation. These characteristics of Francesco's scientific mentality became even more apparent when his interests focused on an especially fascinating subject, such as the role of light as an information carrier to living organisms. Toward this end, starting from 1975 till now, Francesco's activities were predominantly devoted to the study of phototile responses in flagellated unicellular photosynthetic algae and ciliated protozoa. Such studies ranged from the primary photophysical and photochemical events taking place in the photoreceptor pigments, as well as in their complexes with the associated proteins, to the metabolic and physiological strategies adopted by microorganisms in order to optimize their interaction with light or protect themselves against potentially damaging consequences. There are very few examples of complex biological systems which have been studied to such a complete and systematic extent by one laboratory, each step in the overall work design being at the same time innovative and suggestive of additional progress.

Looking back through the decades, one can safely state that Francesco was a pioneer in the development of supramolecular photobiology, applying its concepts to both artificial models and natural targets including functionally active cells. As a result, the research unit, which he gradually organized by selecting highly motivated investigators when he was appointed as the director of the CNR Institute of Biophysics, came to play a front-running role and to represent a reference point for all those who are interested in photosensory biology, as shown by the numerous reviews and invited lectures at international congresses that Francesco and his coworkers were asked to prepare. Highlights of Francesco's scientific production in regard to this research line are represented by the paper published in *Acc. Chem. Res.*, 2001, **34**, 9, which provides an exhaustive and



well organized *mise-au-point* of the state-of-the-art for studies on photoresponsive polypeptides, and the whole set of investigations on the photosensor pigments of *Blepharisma japonicum*. These include *inter alia* the identification of the chemical structure of blepharismisin described in *J. Am. Chem. Soc.*, 1997, **119**, 5762, and the target analysis of the primary photoinduced events in the oxyblepharismisin-binding protein, published in *J. Phys. Chem. B*, 2007, **111**, 690: two really ground-breaking papers in the field.

Francesco's attitude toward science is also characterized by a high degree of versatility, probably reflecting his ability to stay abreast of the literature in several subsections of photobiology and to pull together ideas from disparate sources. Thus, he found enthusiasm and curiosity to explore a variety of research topics, including the environmental problems induced by the action of UV radiation on phytoplankton and freshwater ciliates; the effect of photosensitized processes on lens proteins; and, more recently, the possible role of hypericin in the prevention of Alzheimer disease.

Most importantly, Francesco considered a must for a scientist to use his knowledge and expertise as tools for addressing questions of high social impact. Therefore, he took advantage of his awareness about the dire consequences of high-energy radiation on humans and ecosystems to actively support initiatives aimed at stopping nuclear tests and banning nuclear weapons. For several years, Francesco was a driving force in the organization of forums and brainstorming meetings where the problems connected with disarmament were thoroughly debated. This led to a dif-

fusion of books and articles centred on the avenues to be followed in order to enhance the perspectives of peaceful solutions of conflicts. The great sensibility displayed by Francesco for this kind of problem nicely matches his unusually passionate endeavour to share his deep enthusiasm for photobiology with his peers, especially with younger investigators. Typical examples of this attitude are represented by the Digital Photobiology Compendium, edited by D. Valzeno on behalf of the American Society for Photobiology (ASP) to whose preparation Francesco gave remarkable contributions and, even more, the two editions of the *Handbook of Photochemistry and Photobiology*, a truly monumental and extremely informative work, which he personally took care of in collaboration with W. H. Horspool. However important such activities have been, they have been complemented by initiatives that allowed Francesco to directly interact with students or newcomers to photobiology, such as the Advanced Study Institutes he organized in Pisa, the Photobiology Schools inserted into the programme of several congresses, the availability to act as a visiting professor in institutions located in developing countries, the supervision of PhD dissertations, and the tutoring of students from different disciplines. As a chairman of the Education Committee of the European Society for Photobiology (ESP) he managed to grant as many fellowships as possible to young investigators to facilitate their attendance of congresses and their visits to other laboratories. I do not know of any person who contacted Francesco for help or advice and was not satisfied with his response and his kindness. I could personally experience

Francesco's exquisite way of acting. As the senior editor of photobiology journals, I often asked his collaboration for refereeing submitted papers; invariably his reviews were scientifically honest, sometimes tough, but fair: even in the case of severe criticisms Francesco never forgot to add constructive indications in a clear effort to encourage the authors (in particular, investigators of young age or belonging to "poor" laboratories) to properly address difficult situations and better orientate their work plan.

It goes without saying that Francesco's multi-faceted activities and achievements have been duly recognized by his colleagues. He was elected as an officer of both ASP and ESP and served as the ESP President in the 2005–2007 period. In 2001, ESP awarded him a medal for excellence in research and promotion of photobiology. Certainly, such appreciations represent a well deserved tribute to his tireless commitment. However, I am sure that Francesco perceives the most rewarding outcomes of his lifelong activities are to have: built a scientifically-outstanding research group which is pursuing and extending his investigations; attracted a large number of people into the photobiology world; helped several young investigators in their scientific career; contributed to the establishment of mutually-inspiring links between science and society. In this way, Francesco has generated a broad family of "photobiological children", that nicely add to his two natural children and two (for the time being) grandchildren to luckily give him a lovely and happy personal life.

Giulio Jori

University of Padova