

A tribute to Francesco Lenci on the occasion of his 70th birthday

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Since Francesco Lenci graduated in physics from the University of Pisa, he was immediately attracted to the study of biophysical processes, in particular those that involve the interaction of light and biological matter. He and his group have been one of the leading groups in the field of the study of motile responses of microorganisms to light stimuli, with particular attention devoted to the first photophysical steps initiating the sensory transduction chain. In the early 1980s he became involved in the study of the processes of arms control, peace and disarmament. His contribution to the growth of the peace movement in Italy has been of great value, universally recognized and he has become rapidly one of the leading scientists in this field. For many years he was Secretary General of USPID (Italian Union of Scientists for Disarmament), a position that he held until he was nominated Director of the Institute of Biophysics. In 2006 he was elected member of the General Scientific Committee of the Italian National Research Council, a committee that gives advice on the scientific policy of the institution.

As a photobiologist, among other duties, he has been President of the Italian Society for Photobiology (1992–1998), President of the European Society of Photobiology (ESP; 2003–2005), Vice-President of the IUPB (2000–2004), council member of the American Society for Photobiology (ASP; 1998–2001 and 2010–2013), chair of the ESP Education Committee, associate editor for *Journal of Photochemistry & Photobiology, B* (1989–1995) and *Photochemistry & Photobiology* (2000–2010). In 2001 he received the ESP Award for excellence in photobiological research.

Silvia Braslavski has known Francesco Lenci since the Foundation of the ESP in 1985. She notes that Francesco

has played a very important role within the ASP and the ESP, as an officer in the Executive Committee, as responsible for the education Committee and as associate editor for the journals, but also as a strong supporter and promoter of the sometimes neglected research groups devoted to photosensors. She mentions that Francesco was a very active participant and “tourist guide” during the Gordon Conferences on Biological Photosensors in Il Ciocco, near Lucca, in 2000 and 2002. These were very exciting and special conferences in which the type and number of biological photosensors that were presented underwent an explosion and all the participants shared their happiness, astonishment and sometimes critical views about the expansion of the field. Silvia also remembers Francesco’s enormous generosity and friendship by hosting several participants in his home before and after the meetings and by showing them the beauties of his country as well as the culinary jewels (never forgetting the wine!). She also points out that Francesco also has been very active in supporting young researchers, both in his institute in Pisa and from his position on the ESP committees, and has always been open to the application of new technologies to solve old photobiological problems, in particular those related to photomovement of microorganisms. Last but not least, Francesco has always been very aware of his social responsibility as a scientist and has contributed to the Pugwash Conferences for a more peaceful world with fewer weapons and in which conflicts are solved by dialogue instead of brute force. Silvia wishes Francesco many more years of active participation in the several activities he has engaged on, *i.e.*, photobiology, the Pugwash movement and family life with his wife Mavi, their children and grandchildren, and the many

friends he has made around the world. “Salud, querido amigo Francesco!”

Pill-Soon Song wants first to explain what *go hee* is. In 2002 Francesco celebrated his *hwan gap*, meaning ‘return cycle of 60 years’ on his 60th birthday. Adding ten years to the cycle is called *go hee*, which means ‘pleasure of being old’ in Korean and Chinese. “So, Carissimo Francesco, congratulations on your *go hee* and enjoy it!” Scientific collaboration and friendship with Pill began when Francesco visited Texas some forty years ago. In the literature and at conferences in those days, one of the hotly debated issues in photobiology revolved around the chemical identification of the blue light receptors in algae and higher plants. One school of thought favoured a carotenoid pigment for the blue light receptor chromophore, whereas the other proposed a flavin molecule for it. Francesco and his co-workers strengthened the flavin hypothesis on the basis of a cutting edge fluorescence microscopic study of the phototactic *Euglena gracilis* cell. This work represented a seminal contribution to the carotenoid *vs.* flavin debate. The debate ended in favour of the flavins for both the *Euglena gracilis* blue light photoreceptor (see later) and the *Arabidopsis* receptor. Donat Häder introduced Pill to the photomovement of *Stentor coeruleus*, a giant single cell ciliate in 1979 when Donat joined him for collaboration on sabbatical leave at Michigan State University Plant Research Laboratory. Then, Francesco and his colleagues were also studying the photomovement biology of ciliates. This led Pill to a series of visits to Francesco’s laboratory in Pisa and the NATO Advanced Schools organized around Italy in the subsequent two decades. One of the outcomes of their collaborative studies includes the chemical identification of blepharismine, the chromophore of the photophobic

ciliate *Blepharisma japonicum* by Francesco's former student Giovanni Checucci.

Over the years, Pill came to admire (and envy) Francesco's attributes as a scientist and as a mentor. To Francesco a student in his lab is not only a researcher but also a friend. His concerns for his students and their future careers are truly genuine and unmatched. Pill thinks this personal quality of Francesco accounts for the fact that he remains a popular friend among his scientific colleagues in different countries. To Pill, Francesco is not just a scientist, not just a collaborator, but a true friend. Now that he celebrates his *go hee*, Pill wishes him the very best until the next tribute on his *san soo*, 80th birthday [*san soo* means 'life under umbrella', an appropriate term for the photophobists?].

Masamitsu Wada wants to congratulate Francesco Lenci for his seventieth birthday! Time flies as an arrow. It is now 10 years since Pill kindly celebrated Francesco's 60th birthday, *kanreki*, on Jeju Island. In Japan the celebration of a person reaching 70 years old is called *koki*. The word means "few people live to be seventy from ancient times". In these days the situation has changed, of course. Many people live more than 80 as average life. So, Francesco is still young! Masamitsu hopes he will enjoy the next 10 years not only for public service in science but also for his own life.

It is with great pleasure and respect that **Donat-P. Häder** writes about his honour of having known Francesco Lenci for so many decades. It was in the early 1970s that they first met during an international photobiology conference and soon after started collaborating. They tried to identify the photoreceptor for phototaxis in the flagellate *Euglena gracilis* and even came close to suggesting a flavin as the receptor chromophore (see above). The final honour of solving the puzzle is attributed to Masakatsu Watanabe and coworkers who identified the structure and genetic makeup of a novel photoreceptor (photoactivated adenylyl cyclase) with two flavin (FAD) binding sites. Donat also remembers with joy participating in several NATO summer schools and research conferences that Francesco organized with his co-workers from the C.N.R. Often these conferences were located in a former monastery in

exquisite tourist places such as Florence or Volterra so that after long and interesting days in the lecture hall the participants could delve into the culture and architecture of millennia-old Italian cities, followed by a good night's sleep in a former monk cell. Later Donat and Francesco collaborated on ecophysiological problems in aquatic ecosystems in the Mediterranean, measuring the effects of solar UV radiation on motility and photosynthesis of phytoplankton and macroalgae and occasionally plunging into the pleasant waters themselves and enjoying solar radiation. Donat will always remember Francesco Lenci as a noble, unobtrusive and distinguished character, and will continue to enjoy his cordial friendship.

Francesco Lenci and **Giulio Jori** had plenty of chances for interaction during their long scientific life because of their deeply dedicated activities in the field of photobiology, often coinciding points of view toward many social problems, and – most of all – a very sound friendship. Thus, Giulio and Francesco collaborated and worked side by side in a variety of initiatives, including the strengthening of photobiological research in Italy, the contribution to the establishment and expansion of the ESP, as well as of photobiology in countries outside Europe, through support to photobiology journals and the organization of congresses, advanced schools, books and themed journal issues. They both paid great attention to the opening of possibilities for young investigators to improve their knowledge of the basic and experimental aspects of photobiology. As a consequence, Francesco and Giulio have the pleasure of sharing many pleasant memories, enthusiasm for successful outcomes and a few disappointments. However, the most vivid and fascinating memories of their relationship which are stuck in Giulio's mind are certainly represented by the conversations outside the scientific sessions at congresses, during dinners or post-dinner time; the discussions ranged from scientific topics at large to social or educational subjects, art and culture. Giulio could thus appreciate the exquisite features of Francesco's personality, his great sensibility for problems of major significance such as peace, social justice and protection of environment, his careful attention toward the needs and hopes of younger fellows, the strong

motivation to start different initiatives to help people from developing countries, and his truly vast knowledge of literature, both classical and popular music and figurative arts. Talking with Francesco surrounded by the appropriate atmosphere has always been an enriching experience, a source of inspiration, a stimulation to have a positive and optimistic attitude towards life. Giulio mentions that Francesco has an innate ability to identify the constructive aspects even of difficult situations and transmit such feelings to persons who are in touch with him. Giulio learned from him how a real scientist can spontaneously decide to use his scientific knowledge to improve the quality of life for mankind. Giulio considers it a privilege to have Francesco as one of his dearest friends.

Evelyne Sage feels it a privilege to contribute to this special tribute to Francesco Lenci on his 70th birthday. Francesco's long interest in light interaction with biological matter has sealed a prolonged and friendly relationship with the photophysics and photobiology group of the Museum National d'Histoire Naturelle in Paris. This is how Evelyne was lucky enough as a young photobiologist to approach Francesco. Since the early times, Francesco has been a major actor in establishing and strengthening the links between the Italian and the French Societies for Photobiology. The convivial atmosphere of the Aix-les-Bains and Pisa joint meetings is deep in the participant's memory. Later, Evelyne realized Francesco's engagement for photobiology and his commitment to the ESP and she was very much impressed by the way he ran the society, the input he gave to the society, defending the transdisciplinarity of photobiology and of the ESP, and carefully respecting everyone and promoting opportunities for young photobiologists to deepen and widen their cultural and scientific preparation. Francesco knows Evelyne's strong attachment to and acknowledgement of her elders and she is now happy to relate that his devotion to the ESP and photobiology, his delicacy and kindness are a great source of inspiration for her as president of the ESP, and his friendship a major support. "Wishing him happiness, good health and strength."

Renato Bessason remembered that in 1976 in Tuscany, on a hillside

overlooking Florence, the Pisa group headed by Sandro Checcuci organised a meeting on “Biophysics of Photoreceptors and Photobehaviour of Microorganisms”, at the Badia Fiesolana, a monastery built in the 15th century, where Renato met Francesco Lenci for the first time. In Tuscany, scientists have lived for centuries amongst a number of persons of great intellectual capacity: Dante Aligheri, Michelangelo Buonarroti, Sandro Botticelli, Giovanni Pico della Mirandola, Niccolò Machiavelli, Giorgio Vasari, Leonardo Da Vinci ... and the father of modern astronomy, of modern physics, of modern science, Galileo Galilei. Up to the 20th century, Pisa has remained a centre of excellence where many researchers of great talent, including Guido Pontecorvo, Bruno Pontecorvo, Enrico Fermi (Nobel Prize 1938) and Carlo Rubbia (Nobel Prize 1984) were educated and started their research. Francesco Lenci used the rigor and precision that he had been taught as a physicist at Pisa University in the field of microscopic and spectroscopic techniques to investigate photoreceptor pigments involved in phototile responses of flagellated unicellular algae and ciliated protozoa. Francesco brimmed with new ideas and very early expanded the pioneering expertise to the photoreceptors of microorganisms that were investigated in the Pisa Istituto di Biofisica. Since 2004 he also developed new fields

dealing (i) with femtosecond studies of blepharismins, polycyclic quinones found in the pigment granules of the ciliated protozoan *Blepharisma*, in collaboration with the team of Monique Martin in Paris, and (ii) with aggregation processes of toxic peptides in collaboration with his former student Antonella Sgarbossa. Moreover, in collaboration with W. H. Horspool, Francesco edited the second edition of the *Handbook of Photochemistry and Photobiology*, an essential reference for all photobiologists. He also organised and chaired sessions in a number of schools, Nato Advanced Study Institutes, Gordon conferences, and international congresses in photosciences. Young as well as senior investigators have received fruitful advice and help from Francesco Lenci. Personally, Renato had the great opportunity of being invited by him to participate in the NATO Advanced Study Institute on “Photoreception and Sensory Transduction in Aneural Organisms”, which Francesco organised in Camaiore in 1978. Francesco Lenci considered that scientists had to be strongly connected to society and its problems. He fought against nuclear tests and nuclear weapons, and he defended in many national and international committees the importance of fundamental research and the role of culture taken in its widest meaning.

Kristian Berg got to know Francesco through their joint activities on the

Executive Committee of the ESP: congress planning, the ESP education committee and the ESP Photobiology School. Francesco’s personality, knowledge and enthusiasm are a great source of inspiration for all around him and have made involvement in organizing photobiology activities a great pleasure. Every society requires a person like Francesco who always is there for you, always responding rapidly to your requests and concerns, giving you good advice based on his enormous experience and always being there as your friend. Kristian would like to thank Francesco for more than 10 years of collaboration through the ESP that made this an enjoyable period. “Happy birthday – Gratulerer med dagen!”

The Editor-in-chief (**Rex Tyrrell**) can only echo all these comments on the strength of the friendship and the contribution to science and beyond made by Francesco and from which we have all benefited over the years. This was well appreciated during the hectic organization of the Bath ESP Meeting in 2007 and the Wroclaw ESP meeting in 2009. Francesco’s warmth, positive attitude and generosity has strengthened us all and we wish him good health and happiness in his eighth decade!

Compiled by Jacques Piette (University of Liège, Belgium) with the help of Francesco Ghetti and contributions by close friends and colleagues.