Introducing Charlotte Remé, the 2004 Recipient of the Proctor Medal

It is a great privilege and pleasure to introduce my old friend Charlotte Remé as the 2004 Proctor Medal recipient.

Charlotte was born in Germany in 1939. Her family descended from the Huguenots, which explains her French name and her remarkable resolve! From her grandfather and father, who were both medical doctors, she inherited her love and aptitude for medicine and science; from her mother, who was an art historian, she inherited a passion for the arts, including poetry and dance. With her companion Heinrich, a well-known collector of contemporary art, she shares her interest in the fine arts.

After medical school at the Universities of Hamburg and Tübingen and residencies in Pathology and in Ophthalmology, she appeared destined for a clinical career. But, in 1974, she accepted a research position at the University Eye Clinic in Zürich and started work on nonvisual effects of light on the retina.

To fine-tune her gift for research, she enrolled in a postdoctoral fellowship with Richard Young at the Jules Stein Eye Institute in Los Angeles. It must have been a superb environment: In addition to Richard Young and Dean Bok, other researchers at the Institute were Joe Horwitz and Richard Lolley who would each receive the Proctor Medal (Debora Farber and Richard Lolley shared the award). Charlotte rapidly became an expert at electron microscopy and autoradiography and performed a study of the effects of hibernation on photoreceptor renewal in the ground squirrel. (The animals were hibernating in the cold room where the cadavers of the school anatomy classes were stored!) This work led to her discovery that photoreceptors undergo autophagy, a mechanism of molecular self-digestion that contributes to photoreceptor renewal.

Dr. Remé returned to beautiful Zürich and founded her own Laboratory for Retinal Cell Biology at the University Eye Clinic. She pursued her work on photoreceptor renewal, showing that autophagy occurs in several species and that it proceeds cyclically, according to a circadian rhythm. This led to studies of the role of the retina’s interaction with the circadian master clock in the suprachiasmatic nuclei. Dr. Remé and her colleagues, Anna Wirz-Justice and Michael Terman, are considered pioneers in this field.

From the late 1980s onward, Dr. Remé’s research focused more and more on the deleterious effects of visible light on photoreceptors and the RPE. These effects are strongly suspected to play a major role in the development of age-related macular degeneration. She developed rat and mouse models, in which the retinal light exposures were precisely controlled. Computerized image analyses of electron microscopic images provided accurate metrics of threshold lesions and the extent of light damage. Using these systems, she systematically studied several light conditions and factors that modulate the amount of light damage. Her discovery that lithium exacerbates light damage in rats had direct clinical implications, since lithium salts are used for the treatment of manic depression. She initiated clinical studies of lithium-treated patients and demonstrated reduced retinal sensitivities in these patients. Her concern for the damaging effects of light also led her to call attention to the potential hazards of bright-light therapy for patients afflicted with seasonal affective disorder, and she contributed substantially to the establishment of international guidelines for safe light exposures in treating this condition.

In her Proctor lecture, Dr. Remé will present her elegant work on the “silent death of vision” or the apoptosis of photoreceptors induced by light exposure. She first described this mechanism in the mid-1990s and has since, with many collaborators, demonstrated that this harmful process is regulated by a circadian clock in the retina. She further discovered that lithium sensitizes retinal cells to light damage and that patients with retinal degeneration who are taking lithium have a higher risk of photoreceptor death. She initiated clinical studies of lithium-treated patients and demonstrated reduced retinal sensitivities in these patients.

Please help me welcome Charlotte Remé, a gifted physician and scientist, who will present the Proctor Medal Lecture.

François Delori