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Special issue in honor of Prof. George C. Papageorgiou

EDITORIAL

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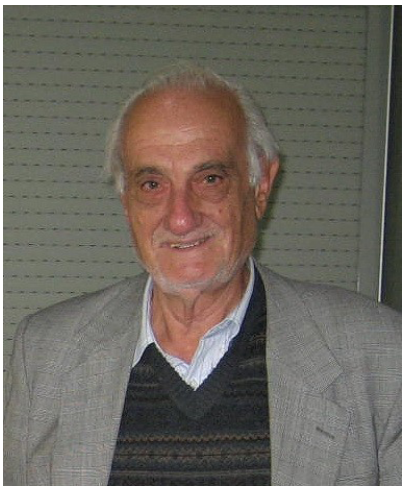
It was with great sadness when we heard, on 21 November 2020, about the death of our friend and collaborator, George C. Papageorgiou. He was a well-known, devoted, and respected scientist, who during his lifelong career contributed greatly to several areas of photosynthesis research [*see* the obituary by Tsimilli-Michael (2021)]. Soon after, we approached his colleagues, former students, and collaborators with the idea to publish a special issue of *Photosynthetica* in his honor. Our goal was to publish the latest research in areas of photosynthesis related to George's interests in a journal, where he had served on the editorial board for more than twenty years (1991–2013).

In this editorial, we do not provide biographical details of George's long and highly successful professional life but refer to Stamatakis *et al.* (2016) and Allakhverdiev *et al*. (2016). Just briefly – after obtaining his Ph.D. in Biophysics from the University of Illinois at Urbana-Champaign with one of us (Govindjee) in 1968, George was offered a position in his native Greece at the National Center for Scientific Research Demokritos in Athens, where he spent the rest of his career as a researcher and science administrator. He was the founder of biophysical research of photosynthesis in Greece. He was considered an excellent teacher and a wonderful mentor by his students (*see* Tsimilli-Michael 2021). His research interest and passion were photosynthesis and its regulation at various levels. George Papageorgiou has published more than 120 papers and edited several books. He has pioneered and developed the use of chlorophyll *a* fluorescence techniques to measure various photosynthetic reactions, including the nonphotochemical quenching of the excited state of chlorophyll *a*, and the role of ions in photosynthesis. In addition, George has also developed and applied the methods of membrane immobilization in photosynthetic studies and was involved in studies and biotechnological applications of hydrogen production by photosynthetic organisms.

The present special issue of *Photosynthetica*, in honor of George Papageorgiou, is a collection of 13 papers (4 reviews and 9 original research), contributed by 57 authors from 14 countries, covering George's research interests.



George C. Papageorgiou (provided by G. Govindjee)

The review by Lazar *et al*. (2022), submitted by one of us (Govindjee), presents the current knowledge about the effects of light spectral quality on oxygenic photosynthesis – on the pigment composition of the antenna, electron transport, and the overall growth of plants and algae. In their perspective, Norio Murata and Kostas Stamatakis (Murata and Stamatakis 2022) review the history of the discovery of the protective and stabilizing effects of glycine betaine on the oxygen-evolving complex of PSII that was initiated by George Papageorgiou; they also present an overview of the subsequent studies of the glycine-betaine-synthesizing cyanobacteria. Barbara Demmig-Adams and co-authors (Demmig-Adams *et al.* 2022) have reviewed the possible role of microbial partners in ameliorating the negative impacts of climate change on plant productivity. The last review is by Voloshin *et al.* (2022), submitted by Suleyman Allakhverdiev. It focuses on the current state and the future advances in the development and the use of PSII-based bio-photovoltaic devices.

The paper by Magyar *et al*. (2022), submitted by Petar Lambrev and Győző Garab, deals with the study of

the rate-limiting steps during the dark-to-light transition of PSII and its dependence on the lipid environment in isolated PSII core complexes from the cyanobacterium *Thermosynechococcus vulcanus*. The research paper by Mattila *et al*. (2022), submitted by Esa Tyystjärvi, deals with studies on the general question of the growth limitation and the susceptibility to photoinhibition, under batch and turbidostat growth modes in several algae. The paper by Yuan *et al.* (2022), submitted by Ya (David) Guo presents the concept of a flexible, computer-controlled plant growth chamber with a feedback mechanism that can utilize photosynthesis models in practical agriculture. The paper by Xia *et al*. (2022), submitted also by Ya (David) Guo, includes studies on the possibilities of quantitative sensing of drought stress using chlorophyll *a* fluorescence, namely the OJIP induction and the accuracy of different statistical and analytical analyses of the resulting parameters. The paper by Georgieva *et al*. (2022), submitted by Maya Velitchkova, investigates the involvement of alternative cyclic electron pathway during the recovery of photosynthesis after freezing-induced desiccation in Orpheus flower (*Haberlea rhodopensis*), a relic plant of the Bulgarian and Greek mountains. The responses of photosynthetic machinery of different growth forms of 12 Mediterranean plants to rapid and slow dehydration are compared in the paper by Koutra *et al.* (2022), submitted by George Grammatikopoulos. The combined effects of low temperature and high light on the photosynthetic performance of the lutein-deficient mutant *lut2* of *Arabidopsis thaliana* are presented in a paper submitted by Antoaneta Popova (Popova *et al.* 2022). The role of anthocyanins as light absorbers competing with photosynthetic pigments and specifically decreasing the efficiency and stoichiometry of PSII in several plant species is analyzed in the paper submitted by Yiola Petropoulou (Zeliou *et al.* 2022). The paper by Hartmut Lichtenthaler and Fatbardha Babani (Lichtenthaler and Babani 2022) reports the differences in the content of various pigments and their ratios among green leaves of C_4 and C_3 plants and their kinetics during senescence in the autumn.

We thank all the 57 authors for their contributions, all the reviewers for their time and input, and Helena Synková and Ivana Štětinová, of Photosynthetica, for their patient support.

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