



OBITUARY

## Bacon Ke (1920–2022): a pioneer of primary photochemistry of photosynthesis

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Bacon Ke (26 July 1920–20 May 2022; *see Fig. 1*) was a physical chemist and an ingenious instrument designer whose work led to an in-depth understanding of the primary photochemistry of photosynthesis, while he worked at the Charles F. Kettering Research Laboratory in Yellow Springs, Ohio. He was a legend among the many luminaries in photosynthesis research (for details, references, and reminiscences, *see Govindjee et al. 2021*). Together with Tetsuo Hiyama (from Japan) and the late Vladimir Shuvalov (from Russia), he discovered the electron acceptor of Photosystem I (PSI), then labeled as P430, shown later to be FeS-A/FeS-B of PSI (for references and overviews, *see Ke 1973 and Ke 2002*). In addition, Ke's research group provided the exact extinction coefficient of P700, the reaction center of PSI, as well as new information on electron tunneling in PSI. A major contribution of Bacon Ke, to students around the world, is his thorough a single-authored book on photosynthesis in Chinese (Ke 1991), and another in English (Ke 2001).

Bacon Ke was born on 26 July 1920, in Hankou, China. He graduated, in 1943, in Chemistry (with a specialization in Physical Chemistry) from Shanghai, and then in Biology, in 1945, from Wuhan. In 1947, he came to the USA, and worked first on 'Artificial photosynthesis' with Dan Trivich, and later on pure chemistry, on the 'Mechanism of bright plating in the acid copper bath', obtaining his Ph.D. in Chemistry, in 1959, at the Wayne State University. From there, he went to the Charles F. Kettering Research Laboratory in Yellow Springs, where he did research in many areas, particularly on the 'Primary photochemistry of photosynthesis'. After several decades of research, he retired, spending the last years of his life in San Francisco, California. During his retirement, he was very active in teaching all aspects of photosynthesis to graduate students in China.

Bacon Ke was a generous donor to the American Chemical Society (<https://legacyplanning.acs.org/legacy->

[leader-stories/bacon-ke](#)); further, at the Wayne State University, he is remembered through 'Dr. Bacon Ke scholarships' for the undergraduates. Bacon Ke passed away peacefully on 20 May 2022 in San Francisco, California. The entire photosynthesis community misses this great friend and well-wisher of us all; he is remembered here for his in-depth understanding of the mechanism of photosynthesis and its application for the benefit of us all.



Fig. 1. A 2006 photograph of Bacon Ke. Source: Teruo Ogawa.

Received 23 May 2022

Accepted 24 May 2022

Published online 26 May 2022

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*Acknowledgment:* We thank G. Garab for reading this obituary and for editing it before its submission.

*Conflict of interest:* The authors declare that they have no conflict of interest.

## References

- Govindjee G., Shen Y.K., Zhu X.-G. *et al.*: Honoring Bacon Ke at 100: a legend among the many luminaries and a highly collaborative scientist in photosynthesis research. – *Photosynth. Res.* **147**: 243-252, 2021.
- Ke B.: The primary electron acceptor of photosystem I. – *BBA-Rev. Bioenergetics* **301**: 1-33, 1973.
- Ke B.: [Photosynthesis: Photons, excitons, electrons, protons, ions, and their interactions with photosynthetic membranes.] Pp. 348. Anhui Education Press, Hefei 1991. [In Chinese]
- Ke B.: Photosynthesis: Photobiochemistry and Photobiophysics. Pp. 763. Kluwer Academic Publishers, Dordrecht 2001.
- Ke B.: P430: a retrospective, 1971–2001. – *Photosynth. Res.* **73**: 207-214, 2002.

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