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COLLOQUIUM SERIES: Breaking the red-limit: driving oxygenic photosynthesis with far-red light

ROBERTA CROCE

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12:00 to 13:00
ICFO Auditorium

BIO:

Roberta Croce studied chemistry at the University of Padova and completed her Ph.D. in Plant Biology/Biophysics at the University of Milano in 1998. After two postdoc periods in Germany (MPI Mulheim a.d. Rurh) and Italy (University of Verona), she got a permanent position at the Institute of Biophysics of the CNR first in Milan and then in Trento. In 2005 she moved to the Netherlands at Wageningen University with a visitor fellowship and in 2006 she got a tenure track assistant professor position (Rosalind Franklin fellowship) at the University of Groningen where she became associate professor in 2008. Since 2011 she is Professor of Biophysics, Photosynthesis and Energy and head of the group at Department of Physics of the Vrije Universiteit in Amsterdam. Her research focuses on the molecular mechanisms of

photosynthesis, using an integrated approach including molecular biology, biochemistry and ultrafast spectroscopy. She published more than 180 scientific articles on the topic of photosynthesis. She is an elected member of the Royal Netherlands Academy of Arts and Sciences (KNAW) and the Royal Holland Society of Science and Humanity (KHMW). She is also a member of the Board of Reviewing Editors of Science and the Plant Cell, and the recipient of several personal research grants. In August 2022 she was elected president o the International Society of Photosynthesis

ABSTRACT:
The capacity of photosynthetic organisms to harvest light is a crucial factor in the photosynthetic process, especially in light-limited conditions, which occur in greenhouses and canopies. It was believed that only visible light could drive oxygenic photosynthesis, bu the discovery of cyanobacteria species containing chlorophyll d and f, which absorb in t e far-red region of the spectrum, has shown that this is not the case. However, due to the r different energetics, chlorophyll d and f are expected to alter the excited state dynamics f the photosynthetic units and, ultimately, their performances. How can cyanobacteria u e far-red light for efficient photochemistry? To answer this question, we use a combination f biochemistry and spectroscopic measurements on intact cells and isolated complexes. e show that chlorophyll f insertion marginally affects the charge separation efficiency f Photosystem I but decreases significantly that of Photosystem II. Surprisingly this effect is mitigated by the addition of an antenna that at the same time increases the absorpt on cross-section of the complex and its efficiency. The difference between the wo photosystems, the response of plants to far-red light, and the possibility of extending he photosynthetic active radiation in crops will be discuss
HOST: Prof. Dr. Nicoletta Liguori
Hosted by: Prof. Dr. Nicoletta Liguori