Western Photosynthesis Conference 2019
Abstract Submission Guidelines

Abstract format:

- All abstracts must be submitted as a Word document.
- The abstract title should be written entirely in **bold capital letters**.
- The next lines should include the author(s) and affiliations, followed by the body of the abstract. The presenting author should be listed first.
- The abstract should end with funding and other acknowledgments (see sample abstract, below).
- Please proof-read all abstracts carefully before submission.
- Figures, illustrations, etc. will be handled on a case-by-case basis.
- Abstracts will be available in PDF format for on-line viewing before the meeting.

Sample abstract:

EFFECTS OF VERY HIGH CO2 ATMOSPHERES ON PHOTOSYSTEMS I AND II OF COMMON CYANOBACTERIA

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The oxygen in the present-day atmosphere was produced by cyanobacteria and similar organisms 2.5-3.5 billion years ago. Early photosynthetic organisms evolved in an atmosphere rich in CO_2 and poor in O_2. We are currently investigating the tolerance of several cyanobacterial species to very high (>20%) concentrations of atmospheric CO2. Cultures of Synechococcus, Synechocystis, Plectonema boryanum and Anabaena were grown in liquid culture and bubbled with CO2-enriched air. Culture growth was monitored by measuring optical density at 750 nm. Damage to photosystems I and II was monitored by redox-dependent differential absorbance (delta A_{830} nm) and variable fluorescence (F_V/F_M), respectively. Synechococcus, Plectonema, and Anabaena tolerated CO_2 concentrations up to 100% when the CO_2 content was gradually increased from ambient by 10-15% per day. However, Synechocystis did not tolerate high CO2. Strains that were sensitive to high CO_2 were also sensitive to low initial pH (pH 5-6), indicating that the formation of carbonic acid was partially responsible for the inhibited growth in

high CO_2 environments. Cyanobacteria that were sensitive to high CO_2 environments (e.g., *Synechocystis*) exhibited rapid inhibition of photosystem II as indicated by decreased F_V/F_M. The results of photosystem I experiments (in progress) will also be presented. In addition to providing insight as to the adaptations necessary on the early Earth, this research has applications for Mars exploration (e.g. a martian exploratory base or greenhouse). Also, this research provides insight into the possibilities, however remote, of forward-contamination of Mars by robotic and human exploration, and the survival of such contaminants. (Supported by grants from the Arkansas Space Grant Consortium.)