Maximizing Hydrogen Production by Cyanobacteria

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When incubated anaerobically, in the light, in the presence of C_2H_2 and high concentrations of H_2, both Mo-grown *Anabaena variabilis* and either Mo- or V-grown *Anabaena azotica* produce large amounts of H_2 in addition to the H_2 initially added. In contrast, C_2H_2-reduction is diminished under these conditions. The additional H_2-production mainly originates from nitrogenase with the V-enzyme being more effective than the Mo-protein. This enhanced H_2-production in the presence of added H_2 and C_2H_2 should be of interest in approaches to commercially exploit solar energy conversion by cyanobacterial photosynthesis for the generation of molecular hydrogen as a clean energy source.

Key words: Hydrogenases, Alternative Nitrogenases, Photobiological Hydrogen Production in Cyanobacteria