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in honor of Nathan Nelson and T. Nejat Veziroglu

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The volume contains abstracts of the lectures and poster presentations at 7th International Conference on "Photosynthesis and Hydrogen Energy Research for Sustainability-2016: in honor of Nathan Nelson and T. Nejat Veziroglu" to be held in June 19–25 (2016) in Pushchino city (Biological Research Center), Moscow Region, Russia. Experimental and theoretical works covering a wide range of photosynthetic and biohydrogen topics, from the primary processes of electron transfer and energy bioconversion to the physiological aspects of photosynthesis and applied aspects of hydrogen production are discussed at the conference. Considerable attention is paid to discussion of structural organization of photosynthetic reaction centers and mechanisms of hydrogen production. The book will be of interest to researchers and students involved in the study of photosynthesis and biohydrogen production.

POSTER 3

ADVANTAGES OF MIXED CARBON FERMENTATION IN BIOLOGICAL HYDROGEN PRODUCTION BY *RHODOBACTER SPHAEROIDES*

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Biological hydrogen (H_2) production is considered as one of the promising ways to generate effective, ecologically clean and renewable energy from various organic substrates, and it can make a significant role in the development of energy technology. Nowadays, the interest of H_2 production by various bacteria is mixed carbon fermentation, mainly because of the cheap and effective carbon sources like glycerol or industrial wastes. Batch photofermentation experiments were carried out to investigate the effect of the composition of the mixed carbon (succinate, glucose, glycerol and acetate) on growth and H_2 production by *Rhodobacter sphaeroides* MDC6521 from Armenian mineral springs. Initial pH, temperature and light intensity were optimized for maximal H_2 production based on our previous research [1]: they were pH 7.0, 28°C, and 2000 Lx, respectively. The results obtained show that in a medium containing glucose in addition to succinate (15 mM) bacterial growth was inhibited and no H_2 production was detected. pH measurements suggest that the metabolism of glucose might create a low pH in the medium, which inhibits the further growth of bacteria. Addition of acetate (15 mM) supported bacterial growth, but didn't show significant difference in H_2 yield compared to control (15 mM succinate only). However, glycerol (15 mM) addition had a positive effect both on bacterial growth and H_2 production. Even though the H_2 production yield (3.6 mmol/L) in the medium containing 15 mM succinate and glycerol didn't reach the value obtained with 30 mM succinate only (6.3 mmol/L), further experiments will be performed to obtain the optimal succinate/glycerol ratio to get the maximum H_2 yield. Combination of carbon sources (succinate, acetate, glycerol, etc.) with different nitrogen sources and other culture condition beneficial for H_2 production can enhance H_2 yield in *R. sphaeroides* an increase the efficiency of transformation of different organic sources.

1. Hakobyan L, Gabrielyan L, Trchounian A (2012) Int Journal of Hydrogen Energy 37:6519–26