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EMS-induced *Dunaliella salina* KU11 mutants affected for growth rate, biomass and beta-carotene production

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Dunaliella salina has great potential as a system for generating commercially valuable products, including beta-carotene, pharmaceuticals, and biofuels. Our goal is to improve this potential by enhancing growth rate and other properties of *D. salina* under optimal growth conditions. We used ethyl methyl sulfonate (EMS) to generate mutants in *D. salina* KU11, a strain classified in Thailand. In a preliminary experiment, we first treated *D. salina* cells with 0%, 0.8%, 1.0%, 1.2%, 1.44% and 1.66% EMS to generate a killing curve. After that, we randomly picked 30 candidates from approximately 300 isolated survivor colonies from the 1.44% EMS treatment (which permitted 30% survival) as an initial test of the mutant screen. Among the 30 survivor lines, we found that two had significantly improved growth rates and cell number accumulation at stationary phase approximately up to 1.8 and 1.45 fold, respectively, two strains had significantly decreased growth rates and cell number accumulation at stationary phase approximately down to 1.4 and 1.35 fold, respectively, while 26 of 30 lines had similar growth rates compared with the wild type control. We also analyzed cell size for each strain and found there was no significant difference comparing all mutants with the wild type. Progress towards analysis of biomass and beta-carotene production will be reported. From these preliminary results, it could be feasible to identify *D. salina* mutants with significant improved growth rate and cell accumulation compared to the wild type; this makes it possible to improve this microorganism as a platform for biotechnology application.

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The presence of *hlg* gamma-hemolysin in MRSA isolated from health care staff in Mofid Children Hospital, Tehran, Iran

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Background & Aim: Methicillin Resistance Staphylococcus aureus (MRSA) is a type of Staphylococci that is resistant to the antibiotics such as methicillin, cloxacillin, dicloxacillin, naficillin and cephalosporins. The *hlg* is an important gene in MRSA strains of *S. aureus*. Gamma-hemolysin is toxic for human erythrocytes. In present study, we sought to examine the prevalence of MRSA strains of *S. aureus* and detect the gene of *hlg* in health care staff.

Materials & Methods: The descriptive study was conducted from January to December 2014. In this survey, 229 nose specimens were taken from the health care staff of Mofid Children Hospital. The isolates were identified as *S. aureus* based on biochemical and phenotypical tests. To determine the profile of antibiotic resistance of S. aureus isolates, the disk diffusion method (Kirby-Bauer) was used according to 2013 CLSI guidelines. The PCR assays were used for detection of *hlg*.

Results: From 229 health care staff, 200 (87.33%) were female and 29 (12.66%) were male. Out of 229 samples, 27 (12%) isolates were positive for S. aureus of which 21 (77.7%) were MRSA and 6 (22.3%) were MSSA (Methicillin Sensitive *S. aureus*). PCR assays for detection of *hlg* were used. Overall, 18 (85.71%) of MRSA isolates were positive for the presence of *hlg*.

Conclusion: In conclusion, gamma-hemolysin appears to be a more possible virulence factor than other virulence factors in MRSA isolates.

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