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Expression program of new zygote-specific (*EZY*) genes in *Chlamydomonas*

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The green algae *Chlamydomonas reinhardtii* differentiates into competent gametes under nitrogen starvation. When opposite gametes are mixed, they undergo a program of zygote formation: digestion of the minus chloroplast DNA, flagellar resorption, synthesis of zygotic cell wall, fusion of nuclei, digestion of mitochondrial DNA, and fusion of chloroplasts. We isolated the mRNAs from gametes and zygotes, and they were hybridized with a cDNA macroarray containing 10,368 ESTs. About 92 ESTs, whose average expression ratio of zygote:gamete exceeded 3-fold, were selected. Twenty-five non-redundant novel genes that were predominantly up-regulated in zygotes were identified by RNA blot analyses. Seven genes were transcribed specifically in the zygote, and these were designated as *EZY*s. *EZY* genes were classified into two categories based on profiles expressed in *imp3*, *fus1* and normal mating. The mating signal alone was enough to induce two of the *EZY* genes, but cell fusion was required for expression of the other five *EZY* genes. When thecompetent gametes were pre-incubated with cycloheximide (CHX) for 30 min and mixed together, zygotes did not proceed with all the subsequent zygotic events. However, six *EZY* genes were transcribed in the presence of CHX.