# Expression of Glucose-6-phosphate Dehydrogenase and 6-Phosphogluconate Dehydrogenase Isoform Genes in Suspension-Cultured *Arabidopsis thaliana* Cells

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The activities of glucose-6-phosphate dehydrogenase (G6PDH, EC 1.1.1.49) and 6-phosphogluconate dehydrogenase (6PGDH, EC 1.1.1.44) were found to increase in suspension-cultured *Arabidopsis thaliana* cells after 10-day-old stationary phase cells were transferred to fresh Murashige-Skoog medium. The activities of these enzymes peaked early in the exponential growth stage of the culture (day 4) and then decreased gradually. The transcript levels of six isoform genes of G6PDH (*AtG6PD1* to *AtG6PD6*) and three of 6PGDH (*At6PGD1* to *At6PGD3*) were monitored during the culture. Two distinct transcript accumulation patterns were observed. In type A, the level of transcripts increased rapidly one day after the cells were inoculated into the fresh medium, and then remained almost constant until the culture reached its stationary phase (day 7). In type B, the transcripts were accumulated transiently at the first day after cell inoculation, then promptly decreased. We also investigated the effect of phosphate (Pi)-starvation and recovery on the expression of these genes. For this, the early stationary phase cultures (day 7) were transferred to fresh Pi-free culture medium. During 7 days of phosphate starvation, no growth of cultures was observed, and the transcript levels of all G6PDH and 6PGDH isoform genes were reduced, apart from one G6PDH isoform gene, *AtG6PD5*, which was continuously expressed throughout Pi-starvation. Compared to the reduction of almost all isoform genes of G6PDH in Pi-starved cultures, the reduction of 6PGDH genes was less severe. We discuss the localization and possible role of individual isoform genes of G6PDH and 6PGDH in connection with published databases.

*Key words:* Dehydrogenase, Pentose Phosphate Pathway, *Arabidopsis thaliana*