

The dynamics of gene expression of *E. coli* in a symbiotic system with *Dictyostelium discoideum*: *E. coli* experiences reduced stress under symbiotic status

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SUMMARY

Symbiotic relationships are normal phenomena in nature, but it is difficult to understand how the relationship is created by only investigating existing symbioses. Todoriki et al. (2002) established an experimental symbiotic system composed of *Escherichia coli* and *Dictyostelium discoideum* that is suitable to monitor the symbiotic process. We report here global expression of *E. coli* genes within one month of the co-culture. Statistical analysis of expression dynamics showed many functional gene categories that characteristically changed expression level in the transition phase. We found that the transcriptional profile of symbiotic *E. coli* stress genes significantly decreased within 6 days of co-culture, for example in desiccation and starvation categories. Additionally, anaerobic respiration, iron acquisition, polysaccharide biosynthesis and amino acid biosynthesis gene expression increased in the symbiotic culture relative to the control culture. The proportion of genes significantly differently expressed was only a few percent of all *E. coli* genes, although phenotypic changes in the symbiosis were dramatic.