



Boric acid increases the expression levels of human anion exchanger genes *SLC4A2* and *SLC4A3*

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ABSTRACT. Boron is an important micronutrient in plants and animals. The role of boron in living systems includes coordinated regulation of gene expression, growth and proliferation of higher plants and animals. There are several well-defined genes associated with boron transportation and tolerance in plants and these genes show close homology with human anion exchanger genes. Mutation of these genes also characterizes some genetic disorders. We investigated the toxic effects of boric acid on HEK293 cells and mRNA expression of anion exchanger (*SLC4A1*, *SLC4A2* and *SLC4A3*) genes. Cytotoxicity of boric acid at different concentrations was tested by using the methylthiazolyldiphenyl-tetrazolium bromide assay. Gene expression profiles were examined using quantitative real-time PCR. In the HEK293 cells, the nontoxic upper concentration of boric acid was 250 μ M; more than 500 μ M caused cytotoxicity. The 250 μ M boric acid concentration increased gene expression level of *SLC4A2* up to 8.6-fold and *SLC4A3* up to 2.6-fold, after 36-h incubation. There was no significant effect of boric acid on *SLC4A1* mRNA expression levels.

Key words: Boric acid; Anion exchanger; RT-PCR; Gene expression