SL809 Production of inducible nitric oxide is required for monocytic differentiation of U937 cells induced by vitamin E-succinate

Song-Ja Kim* and Shin-Sung Kang
*Department of Biochemistry, College of Medicine, Department of Genetic Engineering, Kyungpook National University Taegu, Korea

Many putative differentiating agents arrest cell growth prior to progression of the cell through differentiation. Vitamin E-succinate is known to be a potent modulator of haematopoietic differentiation as well as an inhibitor of cell growth in vitro and in vivo. In this study, we examined whether vitamin E-siccinate could modulate the monocytic differentiation of U937 human monoblasts. Treatment with vitamin E-succinate for 1-4 days inhibited the proliferation of U937 cells. Vitamin E-succinate also induced monocytic differentiation as indicated by the increase in nitro blue tetrazolium reduction activity, and the expression of monocyte specific cell surface antigen, CD11c, and integrins alpha5 and beta1. The monocytic differentiation of U937 cells was also induced when the cells were cultured in fibronectin-coated wells. Monocytic differentiation was enhanced when the cells were treated with both vitamin E-succinate and fibronectin, suggesting that vitamin E-succinate and fibronectin synergistically act on monocytic differentiation of U937 cells induced by vitamin E-succinate and/or fibronectin, nitric oxide was detected in supernatants. The production of nitric oxide was not detected when monocytic differentiation of U937 cells was induced by phorbol-12 myristate 13-acetate, a well known inducer of macrophage-like cell differentiation. Vitamin E-succinate and/or fibronectin induced monocytic differentiation was blocked by the treatment of nitric oxide synthase inhibitor, N-G-monomethyl-L-arginine. In contrast, treatment of cells with sodium nitroprusside, a chemical nitric oxide donor, stimulated monocytic differentiation of U937 cells at early time point. Taken together, these results suggest that nitric oxidde is an important intermediator at an early stage of vitamin E-succinate and/or fibronectin-induced monocytic differentiation of U937 cells.