

## Kinetic analysis of glycathione inhibition of the process of nonenzymatic glycosylation *in vitro* of genetically engineered human insulin

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### Abstract

The kinetic characteristics of inhibition by reduced glutathione of the process of nonenzymatic glycosylation of insulin *in vitro* at its initial stage, wherein it consists of two consecutive steps  $s = 1, 2$  and proceeds in quasi-equilibrium regime by the stage 1 have been discussed. It has been established that glutathione supplements do not disturb the mechanism of this two-stage process, but reduce its rate and the yield of the final product – fructosamine – at stage 2 by binding glutathione (Y) of insulin (I) as a reagent of stage 1 in the chemical compound of type  $I_\alpha Y$  the routing reaction  $p = 3$ :  $\alpha I + Y = I_\alpha Y$ , where  $\alpha$  – module of stoichiometric factor of insulin. Thermodynamic calculations of equilibrium concentrations of all components in working solutions by their initial concentrations using the previously found equilibrium constants in steps 1 and 2 show that the routing reaction 3 is implemented at  $\alpha = 4$  has the equilibrium constant  $K_3^c(T, [c_k]) = 733$  ( $T = 277K$ ,  $[c_k] = 1 \text{ mol/m}^3$ ).