Superoxide Dismutase during Glucose Repression of *Hansenula polymorpha* CBS 4732

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Z. Naturforsch. 57c, 313–318 (2002); received October 31/December 5, 2001

Glucose Repression, M ethylotrophic Yeast, Superoxide Dismutase

*Hansenula polymorpha* CBS 4732 was studied during cultivation on methanol and different glucose concentrations. Activities of Cu/Zn and Mn superoxide dismutase, catalase and methanol oxidase were investigated. During cultivation on methanol, increased superoxide dismutase and catalase activities and an induced methanol oxidase were achieved. Transfer of a methanol grown culture to medium with a high glucose concentration caused growth inhibition, low consumption of carbon, nitrogen and phosphate substrates, methanol oxidase inactivation as well as decrease of catalase activity (21.8 \(\pm\) 0.61 \(\Delta E_{240}\) \(\times\) min\(^{-1}\) \(\times\) mg protein\(^{-1}\)). At the same time, a high value for superoxide dismutase enzyme was found (42.9 \(\pm\) 0.98 U \(\times\) mg protein\(^{-1}\), 25% of which was represented by Mn superoxide dismutase and 75% – by the Cu/Zn type). During derepression methanol oxidase was negligible (0.005 \(\pm\) 0.0001 U \(\times\) mg protein\(^{-1}\)), catalase tended to be the same as in the repressed culture, while superoxide dismutase activity increased considerably (63.67 \(\pm\) 1.72 U \(\times\) mg protein\(^{-1}\), 69% belonging to the Cu/Zn containing enzyme).

Apparently, the cycle of growth inhibition and reactivation of *Hansenula polymorpha* CBS 4732 cells is strongly connected with the activity of the enzyme superoxide dismutase.