

Detection of Structural Change of Superoxide Dismutase in Solution

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Z. Naturforsch. **61c**, 273–277 (2006); received November 2, 2005

We have confirmed that dissociation of the dimeric SOD molecule into a monomeric one can be readily detected in solution by the use of capillary electrophoresis (CE), which is based on the fact that the peak height in the CE profile is highly dependent on the aggregation conditions of the protein molecule. Based on this fact, it has become apparent that the hydrogen peroxide molecule induces the dissociation of the dimeric structure of SOD, and this should give reasonable explanation for the inactivation of SOD by hydrogen peroxide. Our results may give a convenient way for the early detection of the amyotrophic lateral sclerosis in patients, because we can estimate whether the SOD molecule is of a rigid or loosed dimeric structure by the use of this technique. The loosed one has been assumed to exhibit inherent toxicity of the copper center, so-called “gain-of-function” of the mutant SOD.

Key words: SOD, Capillary Electrophoresis, Dissociation of Dimeric Structure