THE EFFECT OF T-2 TOXIN ON PROTEIN SYNTHESIS OF AS-30D CELLS IN VITRO

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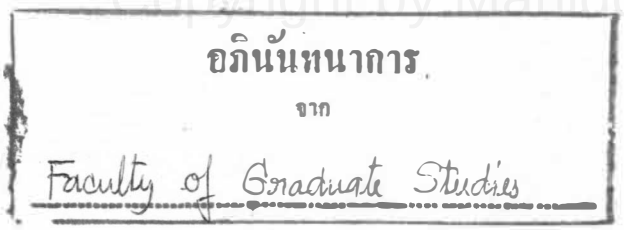

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ABSTRACT

The effect of T-2 toxin on protein synthesis was investigated in both intact AS-30D cell and in cell-free systems prepared from AS-30D cells. T-2 toxin at the concentration of 0.1 or 1.0 microgram per ml could inhibit the incorporation of radioactive labelled amino acids into precipitable protein of intact AS-30D cells to approximately 50 % of the control group within 1.5 min. of incubation. The maximum inhibition of approximately 80% could be observed by 20 min. of incubation and this effect was not influenced by dexamethasone. Similar results were obtained in cell-free protein synthesis system with less degree of inhibition. T-2 toxin at the concentration of 50 or 100 micrograms per ml could inhibit only 70% of labelled amino acid incorporation within 20 min. of incubation. However, this inhibition was still higher than that of cycloheximide at the molar

concentration about 3.4 times of T-2 toxin used. Regarding the mechanism of action of T-2 toxin, the interfering of amino acid transport across plasma membrane that would lead to deminishing the supply of amino acids was unlikely. Since the study revealed an increase in intracellular pool size of labelled amino acids after incubation with T-2 toxin. In addition, the inhibitory effect could still be observed in cell-free system where the supply of amino acids was unlimited. The derangement of cellular energy generating system that was observed after incubation with T-2 toxin could play a role in interfering with protein synthesis. However, this effect was not the major cause for inhibition of protein synthesis since the inhibition of protein synthesis was evident long before the depletion of cellular ATP level. The data on sedimentation pattern of polyribosomes suggested that T-2 toxin could interfere with protein synthesis at the initiation step. The conclusion is in accordance with other studies in different cell lines.