Anti-Tumor Promoting Effects of Aqueous Tea Non-dialysates. Effect on the Cytoskeleton of JB6 Mouse Epidermal Cells

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Introduction

We introduce a new antitumor promoting component, aqueous tea non-dialysates (TNDs)^{1,2)} as a candidate in the primary prevention of cancer. We described the properties of anti-tumor promoting effects and the effect of TNDs on the morphology of JB6 mouse epidermal cells, especially cytoskeletal actin microfilaments.

Methods

TNDs were prepared by the extraction of tealeaves with 500 ml of boiling water per 50 g for 10 min, and were lyophilized. TNDs were obtained by dialysis of the aqueous fraction remaining after sequential fractionation of the crude tea extract with chloroform, ethyl acetate and *n*-butanol. Anti-tumor promoting and related activities were then assayed using mouse epidermal JB6 cells.

Results and Discussion

TNDs suppressed the neoplastic transformation induced by 12-*O*-tetradecanoylphorbol-13-acetate (TPA) in mouse epidermal JB6 cells, although the mode of action of TNDs is different from (–)-epigallocatechin gallate (EGCG). TNDs showed only about one-tenth the cytotoxicity of EGCG in JB6 cells, and showed no selective effect on the growth of the transformants. Therefore, it is suggested that TNDs could suppress the process of tumor promotion. TNDs inhibit TPA-

induced morphological changes in JB6 p⁺ cells, different from EGCG. The effects of TNDs on cell-shape relevant factors such as cytoskeleton and extracellular matrix were investigated. When the monolayer cultured cells were incubated with TPA, cellular stress fibers quickly disappeared, and actin microfilaments became localized around the cellular and nuclear membranes. However, cells incubated with TPA and TNDs blocked the reduction of cellular stress fibers and the shape of cells became morphologically normal. TNDs also showed effects on cellular fibronectin (FN), a component of extracellular matrix, as shown in cytoskeletal stress fibers in JB6 cells. We are now examining the hypothesis that TNDs act on FN of the extracellular matrix to induce the expression, sends a signal to F-actin *via* desmosomes, and inhibits tumor promotion.

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References

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