

Analysis of Coffee's Action on Nephritis and Tumor Through *in Vitro* Testing

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SUMMARY

Transforming growth factor-beta (TGF- β) has been established to be a factor that aggravate glomerulonephritis by stimulating extracellular matrix production and its accumulation in the kidney. This suggests that the inhibition of TGF- β action may suppress further worsening of nephritis. Tumor cells have two biological characteristics, *i.e.*, endless proliferation and metastasis. It is interesting to know whether or not coffee can interfere with TGF- β activity and suppress the proliferation and/or metastasis of tumor cells. We have examined these points using *in vitro* assay systems. Inhibitory action of coffee on TGF- β activity was evaluated by using mink-derived Mv1Lu cells, their proliferation being inhibited by TGF- β . Antitumor effect of coffee was evaluated by using rat ascites hepatoma line of AH109A cells. The effect on AH109A proliferation was measured with the MTT method, while that on invasion, an important step of metastasis, was measured by coculture of AH109A with mesentery-derived cells (M cells). Hot water extract of coffee was sterilized by membrane filtration and added to experimental media. Coffee was found to weakly interfere with TGF- β action and to suppress the invasion of AH109A underneath M cell layers. Effective component(s) might be absorbed across the gut, since serum from coffee extract-loaded rats also inhibited the invasion. Of components present in coffee extract, caffeine seems not to be responsible for the inhibitory action of coffee on invasion. From these *in vitro* results, coffee is expected to reduce nephritis and to suppress tumor metastasis. *In vivo* studies using animal models such as nephritic and tumor-bearing animals will clarify the anticipation.