[P-12]

Effect of capsaicin on melanoma growth and metastasis

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Capsaicin (8-methyl-N-vanillyl-6-nonenamide), a pungent ingredient of hot chili peppers, has been reported to possess substantial anticarcinogenic and antimutagenic activities. In our previous study, we found that capsaicin (100 μM) induced significant inhibition of matrix metalloproteinase-2 activity by gelatin zymography, and that capsaicin (i.p., 2.5mg/kg) inhibited development of lung colonization (58%) in experimental lung metastasis assay. In the present study, we investigated the molecular mechanisms on the inhibition effect of capsaicin for the metastasis. We found that capsaicin (i.p.,1.25, 2.5mg/kg) inhibited the expression of nitric oxide synthase (iNOS) and vescular endothelial growth factor (VEGF) in the tumor lesions using western blot and immunohistochemisty. We also investigated the effects of capsaicin on nitric oxide synthase (iNOS) and cyclooxygenase-2(COX-2) gene expression induced by lipopolysaccharide(LPS) in murine peritoneal macrophages because NO is known to affect tumor progression by regulating the angiogenesis, possibly by stimulating the production of VEGF. We found that capsaicin inhibited production of NO, VEGF in conditioned media, and decreased expression of iNOS, COX-2 in peritoneal macrophages in a dose-dependent manner. These results suggest that capsaicin may prevent metastasis in part through suppression of iNOS, VEGF and COX-2.

Keyword : capsaicin, metastasis, NO, VEGF, iNOS