

# **Inhibition of Cell Proliferation and in Vitro Markers of Angiogenesis by Indole-3-carbinol, a Major Indole Metabolite Present in Cruciferous Vegetables**

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## **Abstract**

A variety of studies have suggested a cancer protective role of cruciferous vegetables. In the present study, we investigated the effect of indole-3-carbinol (I3C), a major indole metabolite in cruciferous vegetables, on cell proliferation and in vitro markers of angiogenesis in phorbol myristate acetate (PMA)-stimulated endothelial EA hy926 cells. The results showed that I3C inhibited the growth of EA hy926 cells in a concentration-dependent manner. The capillary-like tube formation by PMA-activated endothelial cells was significantly suppressed by I3C, and such inhibition was associated with decreased vascular endothelial growth factor (VEGF) and increased interleukin-8 (IL-8) secretion, but not with the expression of VEGF receptor-2 protein. Additionally, gelatin zymography analysis indicated that I3C suppressed activities of matrix metalloproteinases-2 (MMP-2) and MMP-9 stimulated by PMA. These results suggest that the dietary I3C may be useful in the treatment of human cancers and angiogenic diseases.