Activity-Guided Purification of N-benzyl-N-methyldecan-1-amine from Garlic and Its Antitumor Activity against CT-26 Colorectal Carcinoma in BALB/C Mice

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Components of garlic (Allium sativum) have anti-proliferative effects against various types of cancer. We aimed to investigate the capacity of garlic compounds to anti-tumor on a various cancer cell lines. Fractionation of garlic extract, guided by antiproliferative activity against human gastric cancer (AGS) cells, has resulted in the isolation of N-benzyl-N-methyldecan-1-amine (NBNMA). We investigated the effect of newly isolated NBNMA from garlic cloves on the inhibition of the growth of CT-26 mouse colon carcinoma cells in vitro and in vivo. NBNMA exhibited an antiproliferative effect in CT-26 cells by apoptotic cell death. NBNMA exhibited downregulation of anti-apoptotic Bcl-2 proteins and upregulation of apoptotic Bax protein expression in western blot analyses. In addition, NBNMA meager activated caspase 3 and caspase 9, initiator caspases of the extrinsic and intrinsic pathways of apoptosis. NBNMA treatment at a dose of 10 mg/kg for 21 days in experimental mice implanted with tumors resulted in a significant reduction of the tumor weight (43%). NBNMA exhibited both in vitro and in vivo antitumor activity. These results indicate that NBNMA has promising potential to become a novel anticancer agent from garlic cloves for the treatment of colon cancer.