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# Dioscorea nipponica Makino Extract DNE3

National Cancer Institute

## Source

National Cancer Institute. *Dioscorea nipponica Makino Extract DNE3*. NCI Thesaurus. Code C115103.

An extract of the plant *Dioscorea nipponica* Makino and inhibitor of both the serine/threonine protein kinase Akt (protein kinase B) and members of the phosphatidylinositol 3-kinase (PI3K) family of lipid kinases, with potential antineoplastic and anti-metastatic activities. *Dioscorea nipponica* Makino extracted with ethyl acetate (DNE3) binds to and inhibits PI3K and Akt. This inhibits PI3K/Akt-mediated signaling and prevents both growth and survival of PI3K/Akt-overexpressing tumor cells. In addition, DNE3 increases the expression of tissue inhibitor of metalloproteinase-2 (TIMP-2), inhibits the secretion of matrix metalloproteinases (MMPs), primarily MMP-2 and MMP-9, and inhibits the serine protease urokinase (urokinase-type plasminogen activator; u-PA). This inhibits tumor cell invasion, migration, motility, and adhesion. This agent also inhibits the activation of both cAMP response element-binding (CREB) and activating protein-1 (AP-1), and increases the expression of I $\kappa$ B (I $\kappa$ B), which inhibits the activation of nuclear factor-kappa B (NF- $\kappa$ B). These processes further contribute to this agent's anti-tumor potential in susceptible tumor cells.