NK-1 receptor: a new promising target in treatment of cancer

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Abstract

Substance P (SP) has a widespread distribution in the whole body. After binding to the neurokinin-1 (NK-1) receptor, SP regulates biological functions related to cancer: tumor cell proliferation (favoring tumor growth), angiogenesis, and migration of the tumor cells for invasion and metastasis. SP also exerts an antiapoptotic effect. The peptide is secreted from primary tumors and from peripheral nerves, and reaches the whole body through the blood stream. NK-1 receptors are overexpressed in tumors (cancer cells express more NK-1 receptors than normal cells). By contrast, after binding to NK-1 receptors, the NK-1 receptor antagonists specifically inhibit tumor cell proliferation (tumor cells die by apoptosis), angiogenesis and the migration of the tumor cells. Thus, 1) the SP/NK-1 receptor system plays an important role in the development of cancer, angiogenesis, and metastasis; 2) a common mechanism for cancer cell proliferation mediated by the SP/NK-1 receptor system occurs; 3) NK-1 receptor antagonists act as a broad-spectrum antitumoral agent; 4) the NK-1 receptor could be a new promising target in the treatment of cancer; 5) NK-1 receptor antagonists could improve cancer treatment -- the development of antagonist molecules of the NK-1 receptor represents an important opportunity for exploiting these molecules as novel therapeutic agents.

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