

Spotlight

By M.O.

Marine Sponges Rarely Develop Cancer

Rothmeier *et al.*

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A marine sponge in the genus *Spongia* brings unexpected advance to the treatment of pancreatic cancer. The sponge lives in the Eastern Indian Ocean in the Republic of the Maldives and contains a macrocyclic lactone called spongistatin 1. Spongistatin 1 has potent antitumor properties and is among other marine-extracted compounds that may help fight cancer. The fact that marine organisms (especially invertebrates and sharks) rarely develop cancer has fueled the search for tumorsuppressive agents in these organisms.

Rothmeier and colleagues find that spongistatin 1 is effective in preventing tumor progression and metastatic spread of pancreatic cancer in an orthotopic nude mouse model. Pancreatic cancer has one of the highest fatality rates of all cancers. It is called the ‘silent killer’ because symptoms are only noticed during advanced disease when the tumor has widely spread. Median survival from diagnosis is 3 to 6 months due to rapid growth of the primary tumor and spread of metastases.

Daily intraperitoneal administration of spongistatin 1 reduced the growth of existing pancreatic tumors in mice transplanted with L3.6pl human pancreatic tumor cells. This reduction correlated with the induction of apoptosis and enhanced phosphorylation of Bcl-2, a mechanism known to inactivate this anti-apoptotic factor. Importantly, formation of metastases was reduced in spongistatin 1-treated mice. Treatment with the compound suppressed expression of matrix metalloproteinase 9 (MMP-9) in pancreatic cancer cells, and reduced MMP-9 expression and activity correlated with decreased tumor progression and metastatic activity. These findings have obvious clinical implications for patients with pancreatic cancer. They also shed new light on the molecular mechanisms underlying aggressive pancreatic cancer disease.