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Bone marrow transplantation may increase cancer resistance in patients

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Bone marrow transplantation with genetically modified cells may prolong the period of cancer-free survival, suggests a study led by Dr. Vivek Rangnekar, associate director of translational research for the Markey Cancer Center at the University of Kentucky.

Bone marrow, a spongy tissue inside bones, contains stem cells that produce blood cells, including leukocytes, erythrocytes and platelets. In the cover story of the July issue of *Cancer Biology & Therapy*, Rangnekar and his team explore the transfer of bone marrow from Par-4/SAC-transgenic donor mice to control mice as a means of transferring anti-cancer potential.

Par-4 (also known as PAWR) is a tumor suppressor protein that selectively induces apoptosis in cancer cells, but not normal cells. This function of Par-4 is mediated by its central core domain, SAC. SAC-transgenic mice are resistant to the growth of spontaneous and inducible tumors.

After transplantation, the researchers discovered the expression of cancer-killer SAC-GFP activity in bone marrow cells of the recipient mice, implying the successful transfer and colonization of the anti-cancer tissue from the donors. In addition, soluble Par-4 or SAC protein injected into mice inhibited the growth of metastatic tumors.

Rangnekar, the Alfred Cohen Endowed Chair of Oncology Research at Markey, says the study shows promise for treating both primary and

metastatic tumors.

"We are excited by the findings of this study as they indicate that secreted Par-4 is systemically active in mice," Rangnekar said. "Optimization of the bone marrow transplantation procedure using stem cells that are genetically modified to systemically secrete potent protein payloads of Par-4/SAC killer activity may offer a new approach to treat not only primary tumors but also metastatic tumors of diverse origin."

Provided by University of Kentucky