den Brink, MD, PhD, head of Memorial Sloan Kettering's Division of Hematologic Oncology.

The new approach, which was studied in mice with the goal of evaluating the therapy in patients, makes use of immune cells called T cells that are genetically modified to suppress a condition called graft-versus-host disease (GVHD) – a serious complication of transplants in which the donor's immune system attacks the recipient's healthy tissues. In addition, the engineered cells help maintain the beneficial graft-versus-tumor (GVT) effect, which enables donor cells to recognize and attack the recipient's cancer cells.

"Relapse of disease and the development of graft-versus-host disease are some of the most serious complications of stem cell transplantation from a donor. Our study shows that it's possible to simultaneously protect against relapse and prevent GVHD," Dr. Ghosh says. "Further, we showed that cell therapy with engineered T cells could be effective in treating certain cancers."

In the study, mouse models of lymphoma were given genetically engineered T cells following a stem cell transplant from a donor (called an allogeneic transplant). The T cells were modified to produce high amounts of a protein called TRAIL, which is naturally found in some immune cells in the body and is known to induce programmed cell death (apoptosis) in cancer cells. The mice that received the engineered T cells had significantly higher survival rates than mice that received normal T cells, which did not overexpress TRAIL. This survival benefit was due to both less tumor growth and fewer instances and less-severe instances of GVHD.

The researchers also found that the TRAIL-engineered cells could be used to induce cancer cell death in mouse models of certain renal (kidney) cancers.

Dr. Ghosh is available to comment on the study and provide additional perspective.

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