Kim O’Connor, a professor in Tulane University’s Department of Chemical and Biomolecular Engineering, received a three-year $599,638 grant from the National Science Foundation to study ways to improve the survival of mesenchymal stem cells once they are implanted in patients.

Mesenchymal stem cells can change into different types of cells including bone, cartilage or muscle. Harnessing the regenerative capacity of mesenchymal stem
cells has the potential to improve the quality of human life by repairing tissue
damaged by disease, trauma and aging.

“We are delighted to receive the funding for this project,” O’Connor said. “The grant
will allow us to look at the survival of stem cells. Seventy-five percent of these cells
are lost when implanted. We are using cell culture and a mouse model to mimic
stem cell survival in patients. Our goal is to improve the survival rate, and we are
very excited about this opportunity.”

O’Connor is the principal investigator while the co-principal investigators are
Professor Bruce Bunnell, director of the Tulane Center for Stem Cell Research and
Regenerative Medicine, and Professor Yao-Zhong Liu in the Tulane Department of
Biostatistics and Bioinformatics. O’Connor and Bunnell have an ongoing
collaboration on this project, while Liu recently joined the effort.

Mesenchymal stem cells exhibit significant cell-to-cell variation in their capacity to
survive upon implantation, but the molecular basis of why some of these stem cells
survive and others don't is poorly understood. The goal of the project is to improve
the survival of these stem cells by gaining insight into the molecular mechanisms
underlying their different survival outcome. This knowledge has the potential to
advance the stem cell field by overcoming a critical barrier to achieve more effective
stem cell therapies.

O’Connor will direct the study, Bunnell will advise on the animal research aspect of
this study and Liu will advise on the bioinformatics piece. Their students will gain
first-hand experience through laboratory research funded by this grant.

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Professor Kim O'Connor