Turning Back the Clock

Robert Fee

Stem cells are pretty amazing things. Almost weekly, I seem to come across research briefs describing beneficial applications that were unimaginable just a few years ago. Stem cell therapy is becoming more commonplace, and the application potential is reaching exciting levels. The latest one I saw was a press release issued by the American Heart Association (AHA) titled, “Aging Heart Cells Rejuvenated by Modified Stem Cells.”

The research, presented at AHA’s Basic Cardiovascular Sciences 2012 and published in the Journal of the American College of Cardiology, claims that damaged and aged heart tissue of older heart failure patients was rejuvenated by stem cells modified by scientists. “We modified these biopsied stem cells and made them healthier. It is like turning back the clock so these cells can thrive again,” says Sadia Mohsin, PhD, one of the study authors and a post-doctoral research scholar at San Diego State University’s Heart Institute.

The modified human stem cells helped the signaling and structure of the heart cells, which were biopsied from elderly patients. Researchers modified the stem cells in the laboratory with PIM-1, a protein that promotes cell survival and growth. Cells were rejuvenated when the modified stem cells enhanced activity of an enzyme called telomerase, which elongates telomere length. The technique increased telomere length and activity, as well as increasing cardiac stem cell proliferation.

“Modifying aged human cardiac cells from elderly patients adds to the cell’s ability to regenerate damaged heart muscle, making stem cell engineering a viable option,” says Mohsin. “This is an especially exciting finding for heart failure patients. Right now we can only offer medication, heart transplantation or stem cell therapies with modest regenerative potential, but PIM-1 modification offers a significant advance for clinical treatment.”

Regular readers of this column will notice that telomeres come up quite often in this space. In my mind, research in this area represents the key to much of the potential of modern medicine to improve the quality of our lives and defeat many of the diseases that plague us today.

Stem cell therapy also offers this promise of potential. By way of example, I know of two people in my life who have already experienced some sort of stem cell treatment in the past year. Although the end results of those treatments are still pending, the therapy at least offers some hope where there was previously very

little. I'll continue to keep an eye on new potential applications.