A 'Potent' Treatment For Damaged Hearts

An Interview with **Michael Laflamme**, Heart Pathologist, University Health Network, Medicine by Design, University of Toronto

There's something like 50,000 people that suffer a heart attack every year in Canada. Globally the number is obviously much, much larger. And something like a quarter of people that suffer a heart attack will go on to develop some degree of heart failure. And currently we don't have good therapies for that. We can treat the symptoms, we can attenuate the disease process, but we don't have really any way to replace the muscle that's damaged in a heart attack other than to give somebody a whole new heart. And we know there's not enough of those to go around.

The theme of our program as a whole is to try to use a special type of stem cell called pluripotent stem cells to repair a heart after a heart attack. And what happens in that disease, you have a blockage in one of the blood vessels that supplies your heart and all the muscle downstream of that vessel die. The problem is that over time, that lost muscle is replaced by scar tissue. And so our vision is to use stem cells to repopulate or remuscularize that scar tissue, to make it back into functional muscle.

We know how to make heart muscle cells 1.0, but our dream is to be able to make muscle cells 2.0, 3.0, 4.0, so we can continue to refine the cell therapy.

How will your research impact medicine?

We're really excited, we're getting fairly far with testing these cells in models of heart disease. This is what I consider big science, things that would have seemed like science fiction when we were starting this work back in 2002. So

I'm really excited that it's become so tangible. We really would like to get to a first-in-human study with a new stem cell-based therapy for heart disease, in something like a 4-5 year time horizon. So this is not a solution that we have now, but it's also not your great-grandchildren's heart therapy. So my hope is in 5 years we're there, and in 10 years we're through clinical trials, and there beyond this can ultimately become a mainstream therapy.