Public Lecture by Dr. Lawrence S. Goldstein
"The Stem Cell Debate: What It's All About"
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Considerable hope, excitement, and controversy surround the possible use of stem cells to treat devastating human disease. But, what are stem cells, where do they come from, and why is there so much controversy about the science and ethics of their use in medical research and disease treatment? In this lecture, I will address these questions.

The interest in possible uses of stem cells to treat disease arises because many diseases are caused by cellular, tissue, or organ loss or damage, and therefore could be treated by organ or cell transplantation. The problem, however, is that the need for transplants is growing faster than the available supply of donor organs. Hence, great interest surrounds the possibility of developing appropriate transplant material by growing and controlling the behavior of stem cells. For example, insulin-producing pancreatic cells are lost in many forms of diabetes, and so if new insulin-producing cells could be produced and transplanted, then this disease could in theory be treated.

Stem cells are defined as cells that can divide and grow to make more stem cells, but can also give rise to specialized daughter cells that can potentially adopt the normal jobs of cells that are lost in disease. Some stem cells, such as those found in embryos, appear to be able to give rise to all of the many types of specialized cells found in adults. Other types of stem cells, such as those found in adults, are generally thought to be less capable than embryonic cells, although recent experiments have raised important questions about this idea. It is also possible to generate embryonic type stem cells by a method called nuclear transplantation, which is controversial because of the potential of this method to generate cloned adult animals, or perhaps people.

While there is great scientific excitement about research on stem cell properties and the development of stem cell therapies, there is also great political and ethical controversy because some stem cells are isolated from human embryos. President Bush released a plan last summer that will allow some embryonic stem cell research to proceed under strict guidelines. Simultaneously, legislation that would criminalize nuclear transplantation to generate human embryonic stem cells for research or disease treatment has passed in the U.S. House of Representatives, and is pending in the U.S. Senate. At issue is whether and how our society and government should restrict or promote research that has great medical promise, but is also controversial. I will summarize some of the various points of view in the political and ethical debate and relate it to the current state of stem cell scientific research.