

A contentious frontier

By SUSAN L. RIFE

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Tremendous strides in human health and longevity in the 20th century have come, science writer Eve Herold says, because of three things: Improved hygiene and clean water supplies; vaccines to prevent viral infections; and antibiotics to combat bacterial infections, primarily pneumonia.

That leaves genetic diseases and chronic, age-related degenerative illnesses as the great frontier for the 21st century.

Those diseases -- Alzheimer's, Parkinson's, diabetes, muscular dystrophy, multiple sclerosis, various cancers, paralysis caused by accidents and strokes -- are the ones most likely to be helped by stem-cell research.

In her just-published book, "Stem Cell Wars: Inside Stories From the Frontlines," Herold outlines in layman's terms the science of stem-cell therapies, the history of conflict between science and religion, the politics of the debate over embryonic stem-cell research, and the potential cures that lie in "pluripotent" cells, those few cells that occupy the human embryo in the first few days after conception.

Herold, director of public policy research and education at the Genetics Policy Institute, a nonprofit organization "dedicated to establishing a positive legal framework to advance the search for cutting-edge cures," will discuss her book Nov. 4 at the Sarasota Reading Festival. She is clearly in the business of advocating embryonic stem-cell research, which she sees as holding the promise of cures for many of the diseases that devastate human lives.

There are several different kinds of stem cells. Embryonic stem cells, Herold explains, "hold the blueprint for every cell, tissue, and organ of the human body." They are the master cells that eventually generate every kind of cell in the body.

Adult stem cells -- adult being defined as those from the fully developed human body -- also hold tremendous healing potential, but they are limited in their ability to become other types of cells. For example, bone marrow stem cells, useful in battling blood-related diseases, cannot be made into neuron cells useful in healing neurological disease.

Although stem-cell research on animals has been done for about 30 years, it's only been since 1998 that breakthroughs in human stem-cell research have occurred. But those eight years have provoked a firestorm of controversy, with scientists and patients desperate for the cures that seem to hover on the horizon on one side, and conservative politicians and the right-to-life movement on the other. President George W. Bush's decision in 2001 to severely limit federal funding for human embryonic stem-cell research sparked an even greater level of discussion and argument.

For Herold, writing the book seemed a necessary step.

"The whole field is like a roller coaster," she said in a telephone interview last week. "There are so many developments in the science, and the politics are so involved, and the ethics have been discussed far and wide. But there's so much misinformation about it. That was really kind of the catalyst for me to say I have got to answer some of the basic questions about the field. At least understand it before you make a decision."

She acknowledges in her book that there are enough ethical considerations in scientific research to keep bioethicists busy for years to come.

She outlines the wide range of religious beliefs about when life begins and ends. But, she says, the debate over stem-cell research has been misdirected by abortion opponents even though, she said, embryos used for stem-cell research are not the product of abortion. Rather, she said, they are primarily the remaining embryos from couples using in vitro fertilization to conceive their children -- embryos that now either remain frozen in storage or are disposed of as medical waste. Another kind of research involves therapeutic cloning, in which an unfertilized human egg cell has its nucleus removed and replaced with DNA from a patient. Such cell clusters have the potential to be used to treat a specific patient for a specific disease without the risk of rejection that comes with organ transplants.

"That is the clearest, most effective way that we know of today to create stem cells that can't be rejected," said Herold.

She noted that once the DNA is introduced into the egg cell and it is stimulated to begin dividing, "it could be seen as an embryo. No one's done it in humans."

Most Americans support stem-cell research, according to her research, whether it's on embryonic or adult stem cells, said Herold.

"Unfortunately, it's the extremists who ... kind of dominate the debate," she said. "I think that's really unfortunate. There are millions and millions of people who believe that this research is pro-life and it's the right thing to do."

Herold said she's tried to look at the stem-cell debate from the pro-life side, "because truly you want to try to understand. Their position is that an embryo at the stage of fertilization, because it has human DNA, because there are human genes there, should be considered a full-fledged human being."

For Herold, there's a wide range of points of view regarding what constitutes a human being.

"There's more to a person than cells and genes," said Herold, who points out that few-celled embryos "don't really have a high survival rate in nature."

The lack of federal funding for embryonic stem-cell research has brought developments in the United States to a standstill, Herold said.

Research is moving quickly in Great Britain and Singapore, where there's significant government funding. Even in South Korea, where the scientific community was rocked by a scandal in the stem-cell research area last year, research continues at a rapid pace.

"It is an amazingly fast-moving field," said Herold. "Scientists hope they'll be able to offer treatments to genetic illnesses within a decade.

"Some diseases will be treatable earlier than others. The disease that's considered most likely to be treatable first is Parkinson's disease, because it's a very specific type of cell in the brain. Those cells have been created already in the labs."

Still, with all the rapid scientific movement and controversy, Herold expects bioethicists will have plenty of job security.

"It's a question of finding the right place on a spectrum of possibilities," she said. "I'm not optimistic that we'll ever have a 100 percent moral consensus on this."