

Too Good to Be True? Too Early to Tell

BY Dave Andrusko

"Scientists working at a British laboratory have achieved one of the most controversial breakthroughs ever made in the field of stem cell science by taking cells from dead embryos and turning them into living tissue."

Antony Barnett and Robin McKie, writing in the September 24 Observer

"Scientists have been working feverishly in recent years on methods to create lines of human embryonic stem (ES) cells that do not involve the destruction of human embryos. Now, researchers in Europe report they can get new lines from 'arrested' embryos—early embryos that have ceased to develop but that contain individual cells that can be induced to grow separately. They and others say that the technique should satisfy people who object to stem cell research on the grounds that it harms potential human life."

Constance Holden, "Life from Arrested Development?" ScienceNow Daily News, September 22

The opening sentence of Constance Holden's story encapsulates something about which there has been a great deal of recent discussion. Lethally extracting stem cells from living human embryos is a minefield that increasingly many researchers would prefer to avoid. The report alluded to by Ms. Holden appeared September 21 on the web site of the journal Stem Cells and purports to avoid the ferocious controversy.

According to the Observer, the team was led by biologist Miodrag Stojkovic and the work was carried out while he was working at the Centre for Stem Cell Biology at Newcastle. The source was 161 embryos "donated for research" from in vitro fertilization clinics.

According to the study 13 embryos had stopped developing at 6-7 days after fertilization (while at the 16-24 cell stage) and another 119 had stopped development a few days after fertilization. All were referred to as "arrested embryos" in the ScienceNews.com story, while the Observer bluntly says they were "dead."

It was from one of what they called the 13 "late arrested" embryos that the team reported they were able to create one "fully characterized" stem cell line—cells that can develop into virtually all the different kinds of cells found in the human body. According to Nature.com,

"To ascertain that they had stopped growing permanently, the scientists waited up to 2 days after the last cell division before trying to cultivate them. They then plated the embryos on a growth medium. Five of the 13 cultures generated outgrowths. And of these, two developed cells with ES [embryonic stem] cell characteristics. One of these was cultivated into a 'fully characterized' human ES cell line, proving that it could differentiate into all three germ layers both in the dish and in live mice. The earlier-arrested embryos did not produce ES cell lines."

Donald Landry, director of the Division of Experimental Therapeutics at Columbia University in New York, is credited with originating the idea of obtaining embryonic stem cells from dead human embryos in 2004. He had kind words for the research. "Regardless of how you feel about personhood for embryos, if the embryo is dead, then the issue of personhood is resolved," Landry said.

However, there are many unanswered questions. In an Associated Press article that appeared September 22, several experts were skeptical.

For example, George Daley, of the Harvard Stem Cell Institute, told the Observer that the researchers' approach raised scientific concerns. "If there was something wrong with the embryo that made it arrest, isn't there something wrong with these cells? We don't know."