

# ETHICS & MEDICS

A Commentary of The National Catholic Bioethics Center on Health Care and the Life Sciences

## THREE-PARENT EMBRYO CREATION

In October 2015, the United Kingdom became the first country to legalize the creation of three-parent embryos.<sup>1</sup> In the United States, the Food and Drug Administration (FDA) effectively banned their creation in 2001, requiring anyone attempting to develop three-parent embryos to file for FDA approval, but not before thirty genetically modified individuals had been created.<sup>2</sup>

Three-parent embryo techniques supposedly treat mitochondrial disease, but they are not therapeutic. No existing individual is actually cured. Instead, new genetically engineered individuals are produced with the goal that they will not inherit mitochondrial disease.

### Four Different Techniques

Mitochondria are genetic structures inside the cytoplasm of every cell that create energy. In people affected with mitochondrial disease, the mitochondria lack certain functional metabolic enzymes, and thus do not work as they should. Mitochondria are inherited from the mother's egg. If a mother has a mutation in her mitochondrial DNA (mtDNA) that results in mitochondrial disease, she passes that mutation to her children.

Three-parent embryo techniques attempt to manipulate either the egg prefertilization or the embryo(s) postfertilization to reduce the inheritance of the genetic mutation, but these techniques are medically and ethically problematic. Some of the methods necessitate creating three individuals, two of whom will be killed for their parts. All require the use of genetic material from three parents. All change the human germ line, creating genetically modified embryos with unknown and possibly catastrophic consequences to the human race. Some of the methods use techniques of manipulation that are similar to or actually involve human cloning. None of these methods are proven safe for the developing embryo.<sup>3</sup>

*Ooplasm and Cytoplasm Transfer.* The first method, largely unused, is called ooplasm transfer or cytoplasm transfer. Ooplasm or cytoplasm is the fluid inside the egg cell. In this method, eggs from two different women are harvested. In a Petri dish, the ooplasm with healthy mtDNA is extracted from the donor egg and transferred into the recipient egg (which contains mutated mtDNA), where both healthy and mutated mtDNA populate the ooplasm.

About 5 to 15 percent of ooplasm from the donor egg is transferred into the recipient egg.<sup>4</sup> This dilutes the mutated

mitochondria with healthy mitochondria; however, the mutated mitochondria remain in the ooplasm. Alana Saarinen, now fifteen years old, is one of about two dozen individuals created using this method.<sup>5</sup>

*Maternal Spindle Transfer.* In maternal spindle transfer, eggs from two different women are harvested. The nucleus from the intended mother's egg is transferred into a donor egg with healthy mtDNA which has had its own nucleus removed. This genetically reconstructed egg containing the DNA of two women is then fertilized with the father's sperm. Because the eggs in this phase are ready for fertilization, there is a risk of fertilization by more than one sperm. Therefore, scientists recommended intracytoplasmic sperm injection (ICSI), which poses its own medical risks.

The method was originally unsuccessful. In 2009, reproductive biologist Shoukhrat Mitalipov and his team tried it on primate eggs.<sup>6</sup> The experiments led to the birth of four rhesus monkey offspring out of fifteen embryos originally transferred to the womb; 102 embryos had been originally created but most did not survive. In humans, studies have shown that this method using recombined eggs has a 50 percent fertilization failure rate. The successful fertilizations produced embryos that only developed to the blastocyst stage (between five to nine days postfertilization).

*Pronuclear Transfer.* An embryo initially contains two pronuclei: the nucleus of the sperm and the nucleus of the egg, which fuse together to form the zygote nucleus. Once sperm-egg fusion takes place, a new human being is created. In pronuclear transfer (PN), two one-celled embryos are produced using in vitro fertilization (IVF) or ICSI. The first embryo is produced by fertilizing the mother's egg (containing mutated mtDNA) with the intended father's sperm. A second embryo is produced by fertilizing the donor egg (containing healthy mtDNA) with either donor sperm or sperm from the father.

The two embryos have their pronuclei removed. The pronuclei from the embryo of the intended parents are injected into the cytoplasm of the donor embryo, thus

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creating a clone of the parents' embryo. This third embryo is a genetic recombination of the other two embryos containing the genetic material from the embryo created from the intended mother and father and the cytoplasm—containing the healthy mtDNA—from the donor embryo. Both original embryos are destroyed in the process. There are no published studies of PN transfer in nonhuman primates, or of human embryos produced with PN transfer developing past the blastocyst stage.

*Embryo Nuclear Transfer.* In embryo cell nuclear transfer, the nucleus of an embryo (created by IVF) is transferred into a donor mother's egg that has had its own nucleus removed. This transfer of the nucleus is cloning, which destroys the first embryo. When the nucleus is transferred, a second, genetically recombined embryo is formed with the exact same genetic makeup, that is, a clone of the first one. This technique has not yet been tried on human embryos.

### Moral Analysis

Children have a right to be created in the marital union of husband and wife and to be raised in that union. When scientists and adults play God, they not only deprive the child of creation within that union, but also deprive the child of one biological mother and one biological father.

Children created using three-parent embryo techniques will grow up with the confusion of having two genetic mothers and a father, and knowing that they were possibly the recombined "product" of other embryos—siblings whose parts were sacrificed for their sake. It is unfair to place innocent children at the center of these unethical practices with the knowledge that they were "manufactured" to increase their genetic quality. We can only imagine the emotional and psychological ramifications that such knowledge imposes.

Further, all proposed techniques are illicit because they involve germ-line engineering that permanently alters the genetic makeup of future generations and has unknown future health consequences. In addition to the inherent IVF/ICSI risks, the three-parent embryo techniques pose significant health risks to the embryo. All proposed techniques foster human cloning, and two actually clone the human embryo and also require abortions.

None of the three-parent embryo techniques treat or cure mitochondrial disease. On the contrary, they create genetically modified individuals, and often destroy other individuals in the process, in the hope that the genetically modified ones will not inherit the disease. Those embryos who carry mitochondrial disease are sacrificed "for the good" of other embryos, without regard for the human value of all of the embryos involved. The intentional creation of a "defective" embryo, which is then destroyed to obtain its desirable, healthy parts for use in a new and biologically superior embryo, is a type of eugenics.<sup>7</sup>

In IVF, the "best quality" embryos are chosen for implantation. These are the embryos that show the best chance of success according to the determination of the lab technician or doctor, a decision rooted in a eugenic mindset. In addition, all three-parent embryo techniques commodify, exploit, and endanger women because of the need for healthy donor eggs, without which the techniques

would not be possible. Some of the medical risks associated with egg retrieval include ovarian hyperstimulation syndrome, ovarian cysts, chronic pelvic pain, blood clots, kidney disease, premature menopause, respiratory distress, renal failure, stroke, loss of fertility, reproductive cancers, and even death.<sup>8</sup>

There are alternative treatments for mitochondrial disease that do not require the creation of three-parent embryos or the creation and deaths of other embryos.<sup>9</sup> Such possibilities include transfer of mitochondria from donor adult stem cells to other tissues, removal of the unhealthy mitochondria via TALENs (a technology for targeted genome editing),<sup>10</sup> and genetic modifications in already existing or born humans without alteration of the germ line. Other genome editing techniques (CRISPR/Cas9) provide hope that genetic mutations can be corrected<sup>11</sup> using targeted RNA import.<sup>12</sup>

As we seek to discover moral treatments for mitochondrial disease, we must guard the dignity of each human being.

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## THE HOLY INNOCENTS

*"Before I formed you in the womb I knew you, and before you were born I consecrated you." (Jeremiah 1:5)*

*"On you I was thrust from the womb; since my mother bore me you are my God." (Psalm 22:10)*

*"Human life must be respected and protected absolutely from the moment of conception. From the first moment of his existence, a human being must be recognized as having the rights of a person—among which is the inviolable right of every innocent being to life." (Catechism, n. 2270)*

The Catholic Church often finds itself alone in the United States and in the international community in its defense of life and the rights of the unborn. In the United States and Canada, we find some of the most extreme legislation and judicial decisions, literally leaving the unborn child with no rights and defenseless. Much like the *Dred Scott* decision to defend slavery in the nineteenth century, long after most predominantly Christian nations had given up the practice, *Roe v. Wade* once again puts us on the wrong side of history.

*Roe v. Wade*<sup>1</sup> is the 20th century equivalent of *Dred Scott v. Sanford*—the infamous decision holding that slaves and their descendants were not and could not be "citizens" of any American State for purposes of the Constitution. Conceptually, the *Roe* abortion rule is like slavery; it dehumanizes and treats as chattel a whole class of humanity. As *Dred Scott* held that blacks were not persons entitled to constitutional protection, so *Roe* holds that unborn humans are not entitled to basic constitutional protection for their lives. As the Court in *Dred Scott* said that black slaves are merely the property of their owners, so *Roe* said that an unborn human being is merely property belonging to her pregnant mother— which the woman can dispose of as she wishes. If, as Abraham Lincoln said at Coopers Union, the message of slavery is that a man is not a man if he is black, the core message of *Roe* is that a human being is not a human being if she is in utero.<sup>2</sup>

The justice which the Catholic Church seeks for the unborn is part of the "seamless garment" of life, the association of life issues with the cloak of Jesus that his executioners could not tear because it had no seam. This term was coined by the Catholic activist Eileen Egan (1912–2000), and popularized by the late Joseph Cardinal Bernadin (1928–1996), to promote the notion of a "consistent ethic of life" concerning abortion, capital punishment, and euthanasia. In the last hundred years, we have witnessed the holocaust of the Jewish people at the hands of the Nazis, the holocaust of the Armenians by the crumbling Ottoman Empire, and the holocaust of the unborn, which in length of years and numbers lost, is greater than all the others.

### The Right to Privacy

The philosophical and judicial notion of a "right to privacy" has its roots in the philosophy of the seventeenth-century British empiricist philosopher John Locke, whose

ideas on government greatly influenced Thomas Jefferson. Locke opposed the "divine right of kings," which was accepted in France and other European countries of his day. He supported deposing the last Catholic monarch of England, James II, and installing William and Mary to rule as limited monarchs. In his natural rights theory, Locke proposes that every person is born with a right to life, liberty, and private property. These three inalienable rights could not be taken away by any monarch or parliament.

It is this third right of Locke's theory, the right to private property, that has been employed by modern pro-choice proponents to support their idea of a woman's right over her body and its extension over the unborn child. This of course was never the intention of Locke himself. His concern was to limit governmental search and seizure of property and to further an idea that the fruit of one's labors are a part of one's person. Mary Ann Glendon, the Learned Hand Professor of Law at Harvard University and a former US ambassador to the Holy See, discusses this shift: "Much of the attention the Supreme Court once lavished on a broad concept of property . . . it now devotes to certain personal liberties that it has designated as 'fundamental.' Remarkably, the property paradigm, including the old language of absoluteness, broods over this developing jurisprudence of personal rights. The new right of privacy, like the old right of property, has been imagined by the Court and lawyers generally as marking off a protected sphere surrounding the individual."<sup>3</sup> The right to privacy was "quite literally pulled from the hat of property."<sup>4</sup>

The right of privacy first emerged from the right to private property in American jurisprudence in 1890, but was concerned with the protection of private communication from unlawful use by the press and publishers. It entered the realm of law concerning human sexuality in 1965 when the Supreme Court struck down contraceptive restrictions legislated by the states in *Griswold v. Connecticut*. This decision was a nod of the Supreme Court toward Planned Parenthood and its contraceptive programs.<sup>5</sup> This fallacious extension of the right to private property to a right to privacy, along with the usurping of states' rights by the Supreme Court, reached its pinnacle in the landmark decision of *Roe v. Wade* in 1973.

Ironically, part of the argument for legalized abortion was the "bad science" of the time, specifically, the idea that it was impossible to say when human life begins, or when the fetus feels pain or has viability outside the womb. All these arguments have been debunked by science today, so much so that even the pro-choice feminist Naomi Wolf has declared that abortion is the taking of a human life.<sup>6</sup>

### *Evangelium vitae*

In 1968, Pope Paul VI reaffirmed the Catholic Church's teaching on the protection of the unborn child's right to life: "Therefore We base Our words on the first principles of a human and Christian doctrine of marriage when We are obliged once more to declare that the direct interruption of the generative process already begun and, above all, all direct abortion, even for therapeutic reasons, are to be absolutely excluded as lawful means of regulating the number of children."<sup>7</sup>



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Pope St. John Paul II further emphasized Catholic teaching on life in his encyclical letter *Evangelium vitae* of 1995, which was written to proclaim that “the Gospel of life is at the heart of Jesus’ message. Lovingly received day after day by the Church, it is to be preached with dauntless fidelity as ‘good news’ to the people of every age and culture.”<sup>8</sup>

John Paul II points to the confusion of culture today, the devaluation of life, and the violence against the poor, the elderly, women, the handicapped, and the unborn. He names this the “culture of death,” which violates the sacredness of human life:

In fact, while the climate of widespread moral uncertainty can in some way be explained by the multiplicity and gravity of today’s social problems, . . . it is no less true that we are confronted by an even larger reality, which can be described as a veritable structure of sin. This reality is characterized by the emergence of a culture which denies solidarity and in many cases takes the form of a veritable “culture of death.” This culture is actively fostered by powerful cultural, economic and political currents which encourage an idea of society excessively concerned with efficiency. . . . In this way a kind of “conspiracy against life” is unleashed. . . .

In order to facilitate the spread of abortion, enormous sums of money have been invested and continue to be invested in the production of pharmaceutical products which make it possible to kill the fetus in the mother’s womb without recourse to medical assistance. On this point, scientific research itself seems to be almost exclusively preoccupied with developing products which are ever more simple and effective in suppressing life and which at the same time are capable of removing abortion from any kind of control or social responsibility.<sup>9</sup>

Reflecting on Sacred Scripture in Jeremiah, Job, Psalms, and the meeting of the Virgin Mary and Elizabeth in Luke, John Paul II writes, “How can anyone think that even a single moment of this marvelous process of the unfolding of life could be separated from the wise and loving work of the Creator, and left prey to human caprice?”<sup>10</sup>

### Prayer to the Holy Innocents

While St. Stephen is counted as being the first Christian martyr, in fact he was preceded by the Holy Innocents. The selfish pursuit of power and the unwillingness to be open to the Truth led Herod to carry out their slaughter in the hope that one of them would be the baby Jesus. Unfortunately, in our culture the pursuit of personal wealth, power, and extreme individualism, coupled with a secular agnosticism as regards Truth, has produced a new group of Holy Innocents, again in efforts to remove Jesus, the Lord of Life, from our world.

Just as individuals are judged not so much by the way they treat their peers as by how they treat those over whom they have an advantage, so shall our society be judged by how we treat those who are least powerful and in the greatest need of our protection.

*Our Lady and the Holy Innocents, pray for us!*

Rev. David A. Fisher

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5. See Janet E. Smith, *The Right to Privacy* (Philadelphia: National Catholic Bioethics Center, 2008), 35–41.
6. Naomi Wolf, “Our Bodies, Our Souls,” *New Republic*, October 16, 1995, 26–35.
7. Paul VI, *Humanae vitae* (July 25, 1968), n. 14.
8. John Paul II, *Evangelium vitae* (March 25, 1995), n. 1.
9. *Ibid.*, nn. 12–13.
10. *Ibid.*, n. 44.

