

Cloning, Genetic Engineering, and IVF

A Valley Bible Church Position Paper
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This paper will outline some of the biblical, moral, and scientific issues surrounding cloning, genetic engineering, and in vitro fertilization (IVF, also known as “test-tube babies”). This paper is necessary as these procedures have now become possible and in the case of IVF, commonplace. The conclusion is that IVF and genetic engineering are acceptable within certain restrictions. The consequences of human cloning are not acceptable at this time and for the near future, though it might be acceptable in the long term.

The start of life

One crucial initial question is “when does life begin?” Our position paper on abortion addresses this question. This paper will accept the position shown in that paper: an individual person exists from the moment of conception (fertilization of an egg by a sperm). From that moment, the single cell will develop into a healthy adult human if given food, water, oxygen, and an appropriate environment. That development normally takes about 13 years. It would be unreasonable to arbitrarily pick some time between conception and adulthood to call the beginning of a person’s life. For a more complete discussion, please see the abortion position paper.

While we are morally bound to treat the fertilized egg as a person, we are not morally bound to treat other cells that way. An unfertilized egg or sperm or skin cell by itself has a different status. None of those cells will grow into an adult human given only food, water, oxygen, and an appropriate environment. None of these cells can be considered a person.

In Vitro Fertilization

In vitro fertilization (IVF) is the practice of combining egg and sperm outside the body, then implanting the resulting embryo into the uterus of a woman. This procedure was first done in 1978. Since then, it has allowed hundreds of thousands of infertile couples to be blessed with children. The procedure is usually safe for both the woman and the child.

The Bible does not specifically mention this procedure, but does give a few relevant commands such as:

- Love your neighbor as yourself (Leviticus 19:18)
- Do unto others as you would have others do unto you (Matthew 7:12)
- Children are a blessing from the Lord (Psalm 127:4-5)
- Do not murder (Exodus 20:13)

The Bible frequently treats children as a blessing from the Lord, and gives many examples of those who longed for children and were grateful when they came. If we love the people who are suffering from infertility, then helping them might be the loving thing to do. There are no biblical principles that would stop us from showing love in this way. This would suggest that IVF is acceptable, at least in principle.

However, there are several issues that must be addressed. First and foremost is the command “do not murder.” If we accept that a fertilized egg is a person, then killing a fertilized egg or embryo would violate God’s command. One common practice for IVF is to fertilize many eggs at once and implant them in the mother at the same time. They all grow for a while, then the doctor kills all but the most successful. If abortion is wrong, then this procedure is wrong. The alternative is to implant one, and wait to see if it grows. If it doesn’t work, then the doctor can try again. This procedure is more expensive, stressful, and time consuming. Another alternative is to implant several and allow all of them to be born. This can lead to multiple births. Although there are drawbacks to these alternatives, they are the only moral choices since we cannot intentionally kill any of the implanted eggs.

Another common practice is to fertilize many eggs at once, and freeze whichever embryos aren’t immediately needed. Once the mother achieves pregnancy, these embryos can be destroyed. They can also be kept in storage, which has led to numerous legal battles over who owns them, and how they should be treated. If embryos are people, then the Bible’s prohibition of murder would prevent us from killing them. The moral alternative would be to freeze unfertilized eggs and sperm separately and fertilize them as needed. The apparent reasons this alternative is not often practiced are simply due to economics and convenience. It is cheaper and easier to fertilize all the eggs at one time rather than in stages.

There is also the obvious issue of full disclosure. The IVF process can be very expensive, time consuming, and emotionally painful if there are repeated failures. If we are to show love for the couples involved, then we should ensure they are aware of these possibilities as they elect to proceed.

A more difficult question is the issue of risk. Often, an IVF embryo will die after implantation in the mother. On the other hand, an egg fertilized naturally will often die before birth. In fact, naturally-fertilized eggs often die without the mother ever being aware they existed. A Christian needs to carefully weigh the risks and benefits of IVF for the child and the parents.

Stem cell research

People with heart disease often die for lack of a transplant. That could be solved if we could grow new hearts in the laboratory. Debilitating diseases such as Parkinson’s disease might be cured if we could grow the right kind of neurons in the laboratory. We wouldn’t even need blood donors if we could grow new blood in the laboratory. None of these are possible yet, because it is difficult to grow new tissues, especially cells such as neurons that don’t naturally reproduce.

Fortunately, there are some cells in the body called “stem cells.” These cells are able to reproduce, and to turn in to many different kinds of cells. They hold the promise of being able to cure a wide range of diseases by growing new tissues or organs for transplants. Two kinds of stem cells have been in the news lately: embryonic stem cells and adult stem cells.

A fertilized egg is a single cell that will eventually grow to be an entire adult human. Even after the egg has divided several times to form a hollow ball of cells (the “blastocyst”), each of the resulting cells still has the ability to become any kind of cell in the body (“totipotent”). These are called “embryonic stem cells” because they come from an embryo. They might someday be used to grow new organs that could be transplanted to cure diseases. Unfortunately, they can only be made by killing an embryo. If an embryo is a person, this violates God’s command “do not murder.”

Research can also be done using existing embryonic stem cell lines. These are cells that are derived from an embryo that was killed in past, whose cells have now reproduced multiple times and are being cultured to reproduce still more. This has the advantage of not killing any new embryos. However, it has two problems. First, it is exploiting a killing that has been done in the past. Second, if the research is successful, it will encourage more killing in the future, by creating a market for embryonic stem cells. It would be better to find some other source of stem cells that is not morally questionable.

Fortunately, stem cells can also be obtained from adults. In recent experiments, fat was removed from adult volunteers by liposuction. It was then found that stem cells were mixed in with the fat cells. These stem cells from adults (“adult stem cells”) were then made to reproduce, and form muscle tissue, cartilage, and even neurons. That is a very promising result. The donor of the cells was not killed or injured. Some people even pay to be liposuctioned! The adult stem cell itself could not be considered a person. It will not grow into an adult human, even if given food, water, oxygen, and an appropriate environment. From a moral perspective, there are no problems with doing experiments with adult stem cells. Such experiments might even lead to treatments for a wide range of diseases that could save millions of lives.

Are adult stem cells able to become every type of cell? In other words, are they totipotent just like embryonic stem cells? No one knows. We do know that they can become a wide range of cell types. We do know that embryonic stem cells come from killing embryos, but adult stem cells do not require killing anyone. Therefore, the moral alternative is to experiment with adult stem cells only, rather than embryonic stem cells.

Human cloning

Human cloning is the creation of a person who is an identical twin of someone else. The first clone of a mammal was Dolly the sheep, born in 1997. Since then, numerous clones have been born, including sheep, goats, cows, pigs, and mice.

Other species have been cloned, but have not yet resulted in a live birth. These include pandas, monkeys, and even humans. Many labs and universities have produced clones, and the process is slowly becoming more reliable. A bull has been cloned from skin cells that were frozen for 15 years. Mice have been cloned, then the clones were cloned, then the clones of the clones were cloned. Even the final generation of mice seemed to be healthy and normal.

The word “clone” is often misused in science fiction (especially movies) so there are many common misconceptions. A human clone would simply be an identical twin of someone else. We do not treat people differently just because they happen to be identical twins. So, we wouldn't treat human clones differently just because they happen to be clones. A clone is not a robot, or a slave, or a different kind of creature. Neither do we say that identical twins are the same person. They are separate individuals. In the same way, a clone would be a separate person. If a family lost a child in an accident, cloning could not bring back that child. All cloning could do is give them *another* child, who was a brother or sister of the child that was lost, and who happened to be an identical twin. A clone of Adolph Hitler would not necessarily cause the death of millions, any more than Hitler's brother would have perpetrated atrocities if he'd had an identical twin.

Cloning is typically done by taking a single skin cell from the animal to be cloned. That cell contains DNA in its nucleus with complete blueprints of the entire animal. An egg is then taken from some other animal, and the nucleus is removed from that egg and discarded. The remainder of the egg is combined with the skin cell. The result is a single cell that acts as if it were a fertilized egg. It can be implanted in a surrogate mother and eventually be born.

So whether the process comes naturally when a man's sperm fertilizes a woman's egg, sperm is artificially inseminated by introducing sperm into the egg medically, the sperm and egg are united outside the body, or a cell is introduced into an egg to create a new cell, conception does occur. As with in vitro fertilization, the single cell will grow into an adult human if it is given food, water, oxygen, and an appropriate environment. If we consider the single cell fertilized egg to be a person, then we would have to consider this cell to be a person too. That would prohibit us from creating extras and killing them. Each one would have to be implanted in a woman.

One proposed use for cloning is “therapeutic cloning.” If an adult had a damaged heart, that adult would be cloned. The egg and skin cell combination would be allowed to grow until it had multiplied to several cells. It would then be killed, and the embryonic stem cells would be used to grow a new heart. If we accept that a fertilized egg is a person, then this procedure would violate God's command “do not murder”. That leaves us with using adult stem cells rather than embryonic stem cells. That issue was addressed in the stem cell section, above.

There are no biblical principles that would rule out human cloning, as long as the clone is not killed. There are several principles, though, that would rule it out *at this time*, and for the immediate future. We are commanded to love our neighbor, and that includes loving the child produced by cloning. With current technology, the vast majority of cloned animals die before birth. Those that are born frequently

have a wide range of birth defects and other problems. They are often too large at birth (about twice the normal size), and sometimes suffer from severe medical problems. It appears that the DNA is copied correctly, but something goes wrong with the controls that activate the genes (called “imprinting”). Also, there may be problems with premature aging. Finally, we don’t yet have enough experience to know whether the descendants of a clone will have medical problems. Given the current state of the process, it would not be loving to create a child with such dim prospects. Choosing human cloning is unwise and the consequences are totally unacceptable at this time.

Genetic engineering

Human genetic engineering is the intentional changing of a person’s DNA. For example, it might be used to cure cystic fibrosis. Cystic fibrosis is a disease where the body fails to produce a certain protein in the lungs. It requires frequent hospitalization throughout a person’s life, and almost always leads to an early death. It might be possible to take a gene that produces the missing protein, and splice it into an ordinary flu virus. A patient might inhale that virus, and the virus would then splice that gene into the lung walls, permanently curing the disease with a single treatment. Some early experiments suggest this might be possible, and that there might be no unwanted side effects. An alternative approach would be to add the gene to a fertilized egg before it grows into an adult with cystic fibrosis. Diagnosis is more difficult, but the treatment would work even better, since the new gene would be in every cell in the person’s body.

There are no biblical problems with genetic engineering in general. Since genetic engineering happens naturally every time we catch a cold, we can accept that genetic alteration is not unprecedented. The command to love our neighbor might move us to cure people with horrible, terminal diseases. Medical treatment is not forbidden in the Bible (cf. Luke 10:34).

However, there is an overriding issue that must be kept in mind. If we love our neighbor, we must ensure that the likely benefit outweighs the likely cost. The field of genetic engineering is still new, and the subtle side effects may not be well understood. It wouldn’t be very loving to offer someone a cure for cystic fibrosis, unless we’re reasonable sure that the cure isn’t worse than the disease. In this case, the disease is so bad, that moderate risks are probably acceptable.

Other forms of genetic engineering will require more study. For example, humans and mice lose muscle mass as they age. In mice, a single injection permanently solved that problem for the rest of their life, by inserting the gene for growth hormone.

In another experiment, a single injection permanently prevented hardening of the arteries, and even removed all of the plaque that had already formed there. These could be beneficial to humans, but don’t have as big a benefit as curing a fatal disease. Therefore, we’d have to do even more testing before trying this on humans.

Finally, there is the difficult issue of germ line genetic engineering. If new genes are inserted in the lining of the lungs, then side effects only hurt the patient. If new genes are inserted in the patient's eggs or sperm ("germ line genetic engineering"), then side effects might hurt the patient, and the patient's children, and grandchildren, and great-grandchildren and so on. The potential for harm is vastly greater for germ line genetic engineering. Therefore, it would be unloving to do it, unless we were *extremely* sure about the costs and benefits. This type of genetic engineering will be the last to become morally acceptable.

Other issues

When discussing these issues, a number of other arguments are raised. These often sound appealing, but lack a biblical basis. Some of them are listed here.

1. It's too early to think about human cloning

Human cloning sounds like science fiction, but it's here already. On November 25, 2001, a paper was published documenting the cloning of several humans. These clones were made using two different techniques, one of which is commonly used in cloning animals. The cloned humans were allowed to grow for a short while, and appeared to develop like ordinary embryos. They then died or were killed, very early in development, when they consisted of only a few cells. A similar experiment previously occurred in Korea. In the U.S., it is currently perfectly legal to clone and kill humans this way. There are numerous labs that have the knowledge and many researchers have said they are interested in doing this.

2. Experimentation on human embryos will save lives

This argument is usually made by those who don't admit the embryo is a person. If the embryo is a person, then the issue is much clearer. The Bible prohibits murder. Our medical community prohibits experiments on people without their informed consent. The Nuremberg trials said experimentation on unwilling humans is a crime against humanity. If the embryo is a person, then this argument is irrelevant.

In addition, it isn't clear that the claim is true. A killed embryo can provide stem cells that might be grown into useful organs to save lives. Is that the only way to get stem cells? Maybe not. Fat taken from an adult by liposuction also contains stem cells that might be grown into useful organs.

Are embryonic stem cells the only way to grow replacement organs? Or would adult stem cells work just as well? No one knows. Some researchers guess it will be easier working with embryonic stem cells, but that isn't certain. After all, adult stem cells taken from fat have been cultured and grown into muscle, cartilage, and neurons. Murdering embryos for their stem cells would be immoral, even if that were the only method to grow replacement organs. It may not be the only method anyway.

3. This is unnatural

The Bible never says to avoid unnatural things and seek natural things. In fact, the Bible describes man in his fallen state as “natural” in (1 Corinthians 2:14). Miracles are unnatural, yet some miracles are good. Even weeding a garden is unnatural, since the ground has naturally brought forth weeds since the fall, yet God intended for Adam to work hard and farm anyway (Genesis 3:18-19). Whether something is natural or not is morally irrelevant.

The issues in this paper may not be as “unnatural” as they appear. IVF is just allowing the natural process of fertilization to occur in a different location. Identical twins happen naturally through a process similar to cloning. Human genetic engineering occurs naturally every time you catch a cold, or are infected with any other virus. Even germ line genetic engineering has occurred naturally this way, according to some scientists. Researchers are simply harnessing natural processes.

4. This is meddling with life itself

The Bible never says to avoid life-and-death actions. Jesus illustrated what “love your neighbor” means by telling a story. In it, one man saved an enemy’s life by medically treating his wounds (Luke 10:34). That was interfering with life itself. So was the execution of criminals (Leviticus 20:2). It is ironic that this argument is sometimes raised by people who approve of blood transfusions. The Bible never mentions genes, but it explicitly says the life is in the blood (Leviticus 17:14).

5. This is playing God

If a doctor or scientist says “I will be like God”, that is the original sin (Genesis 3:5). All people should humbly recognize that they are merely using the tools that God has provided us. That is especially important for doctors who are instrumental in preventing death and aiding birth. It applies equally to scientists involved in genetic research. We should all humbly view ourselves as stewards of the world God has given us (Genesis 1:28). Cloning, IVF, and genetic engineering should be done with humility.

6. If God wanted us to do this, he wouldn’t have given us other means to reproduce

God gave us legs to transport us, and Jesus had perfectly good legs, yet he often used other means of travel, such as donkeys. He even used artificial, man-made transportation technology, such as boats. In fact, God gave us brains that could learn about the world, and made the mechanisms of genetics simple enough that we could understand and manage them. Was his intent for us to do so? The Bible is silent on that issue.

7. People should adopt rather than produce new children

Adoption is a wonderful idea, and many Christians adopt children, at least partially, as a ministry. But does that mean that a Christian is required to adopt,

and should never produce new children? There have always been orphans in need of adoption, yet the Bible never forbids believers to bear children of their own. God commanded that we be fruitful and multiply (Genesis 1:28) but didn't say what methods we should use.

8. God never intended for us to do this kind of thing

Is that in the Bible? If we want to know God's will, we need to rely on what He has told us in His Word. We need to obey His commands, such as love your neighbor, be humble, and do not murder.

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