Is Life to Be Controlled?:

The Light and Dark of Cloning Technology

Biotechnology has been rapidly developing in the recent years, and people now say that after the era of information technology (IT), it will soon become the era of biotechnology (BT). Cloning technology is categorized as part of biotechnology, and modern society still hasn't faced the problem of how to deal with this completely new technology. Whether to accept all cloning methods or ban some as taboos—that is the question. At the start of 2001, cloning technology was still unpractical and half a dream. The Advanced Cell Technology, known as the ACT, succeeded in cloning human embryos. However, these artificial embryos were only able to survive for less than 2 days. 4 years later, in 2005, cloning technology became more practical. And eventually, on January 17, 2008, a scientist team belonging to Stemagen Corporation succeeded in creating clone human embryos using original, natural human embryos. This time, the clone grew up to a complete mature level (Weiss, 2008). These embryos were made from human skin cells, and the Stemagen Corporation was the first in the world to succeed in this attempt. It is apparent that cloning technology is no longer a dream. Nonetheless, it is ironic that we humans, who are the inventors of this technology, still haven't made an international law regarding how to handle with this useful yet dangerous technology. Of course, if we decide to accept cloning, strict rules will have to be made in order to avoid ill-usage. Debates considering

whether life is to be controlled are still undergoing among specialists. There are several points for opinions both for and against cloning technology, but by comparison, it can be said that the merit outweighs the demerit.

Opinions supporting the cloning technology focus on its expectation to raise medical standards, and to revive endangered or even, extinct species. As for the medical purposes, there are 3 aspects that will benefit from the utilization of cloning technology. They are remedy for disease, renovation of damaged organs, and drug production (pharming).

Scientists are interested in stem cells, because they can multiply on their own and generate to any type of cell that constructs the human body. They come in use when understanding the progress of human growth and cure for illness (U.S. Department of Energy Office of Science, 2009). This may work for the diseases that remedies have not yet been found. Stein (2009) stated that stem cell research would help detect genes that cause a certain disease, so it is expected to develop remedies for incurable diseases such as the Parkinson's disease. However, in order for sufficient research to be undertaken, large quantities of stem cells will be needed. It will be difficult to collect natural ones, so if the new cloning technology is to be allowed widely, it will be a solution to this problem.

Since stem cells can be used to make any kind of cell, this method may be applied to make replacement tissues. Replacement tissues are transplanted to a patient who has damaged or virus affected organs. Weiss (2008) mentioned that medical specialists are wishing to grow the cloned embryos and take out organs to use them as substitute organs in the original body. Also, he said that if the embryos used for replacement organs can be cloned from the patient's own cell, the cloned tissues would not be rejected by the patient's immune system, because the organs are constructed with his or her own cell. As a result, the possibility of having problems with rejection after the transplant will greatly decrease.

Pharming "comes from a combination of the words 'farming' and 'pharmaceuticals'" ("Pharming for Farmaceuticals," 2010, para. 1). It is a method taken to create genetically modified animals, by changing the animals' DNA using cloning technology. Due to pharming, the modified animals can produce proteins used for human medicine. An example of this kind of drug is insulin, which is a hormone control drug. Farm animals are used in pharming because some human proteins need to be mixed with cells of farm animals in order to function as a medicine ("Pharming for Farmaceuticals," 2010). Genetically modified farm animals will enable us to make these kinds of medicines more efficiently.

As for using cloning to revive endangered or extinct species, in theory, this is possible. For example, if there were a DNA of a dinosaur that has been preserved in good condition, and a close specie that can offer the womb ("Why Clone?," 2010, para. 7), a dinosaur could be cloned! This procedure can be applied to other species, and it might be useful for restoring a certain area's food chain and environment. Arguments in favor of cloning technology support its potential in the medical field and restoration of global environment.

The demerits of cloning technology are its high failure rate and ethical problems. Despite the growing expectations, cloning is a very dangerous technology. The success rate is only about 0.1% to 3%. This indicates that 97% to 99.9% fails and do not function as proper clones ("What are the Risks of Cloning?," 2010). This is because cloning technology is an unnatural method, since different genes are inserted in an original egg. Also, even for these successful clones, problems occur later in their growth as well. For example, there is the Large Offspring Syndrome (LOS), in which the cloned animals have the tendency to be bigger than their originals at birth, and LOS affected animals often have trouble breathing or with blood circulation. In addition, even if the gene order is the same as the original, as they grow, the clones may not activate the right DNA at the right time ("What are the Risks of Cloning?," 2010). This results of the fact that clone is an artificial presence, and scientists still cannot control everything

yet. From this, it is apparent that cloning technology has still many unsure aspects; therefore, it will be far too dangerous to utilize it on humans until its safety is absolutely assured.

As for the ethical problems, they are most severe when it comes to the topic of human cloning. Rep. Dave Weldon, who fights to ban all kinds of human cloning, said, “Human cloning is now less about the science and more about the novelty, which makes it all the more nefarious” (as quoted in Weiss, 2008, para. 18). Besides human cloning, stem cell research is often considered unethical as well. This is because to create a stem cell from an embryo, the inner cell of an embryo needs to be taken out in order to clone it, which means that the original embryo dies after the procedure (“Creating Stem Cells for Research,” 2010). Samuel H. Wood, chief executive of Stemagen in La Jolla mentioned, “[Cloning human embryos] is unethical and it’s illegal, and we hope no one else does it either” (as quoted in Weiss, 2008, para. 5). The moral objection of killing the original embryo is why former president George W. Bush didn’t approve much stem cell research using human embryos, and restricted federal research money in this field (Stein, 2009). The thought that cloning is unethical comes from the belief that God has made the world, so it is a crime for humans to take over and start controlling life. In addition, some religions including Christian are against cloning technology since they treasure the pureness in all life (Straughan, 2007). If cloning technology is to be accepted in medical fields, the ethical problem

will definitely be one of the main obstacles for cloning to become an everyday technology. To reiterate, arguments against cloning oppose cloning as unsafe and unethical.

Regarding various researches and articles, both sides are fair and relevant, but the affirmative side overpowers the negative side. The negative side's points were that cloning is unsafe and unethical. The fact that it is unsafe is supported by the data of high failure rate, and from this, it can be also said that despite the high cost to clone a living being, the probability of obtaining benefit is very low. "However, others feel that the cost is justified by the human lives that could be saved by the drugs produced" ("Pharming for Farmaceuticals," 2010, para. 17). I strongly support this opinion. If scientists are to give up stem cell research due to the extremely low success rate, who is going to find a cure for those who suffer diseases for which remedies have not yet been found? Also, the success rate is growing rapidly, so it is only a matter of time before cloning will be a safe and accurate technology. However, there is the common tendency of people being too reluctant in researching the area that used to be a taboo. Of course, thorough research is needed before actually applying cloning technology to humans, so scientists mustn't rush, but still, it is expected to positively apply this new technology to our daily lives. As for the ethical problems, it is considered the most difficult issue, because people's thoughts cannot be easily altered, especially when they come from religion beliefs. But for people who worship God,

we may persuade them by introducing an idea that God gave us humans the ability to control life and nature, and now is our chance to work as God's assistant (Straughan, 2007). In short, we can introduce a new way of thinking. However, the advantages and the disadvantages of cloning are hard to compare, because it matters whether you think moral is important than development or not. This is an conflict that cannot be simply solved.

On the other hand, as for the merits of cloning, there were medical use and restoration of the environment. It can be generally assumed that these points are stronger than the demerits, because they are more effective and allow stable benefit. Regarding medical use, the negative side may oppose that pharming should be banned and instead, like how it is now, collect proteins from donated human blood ("Pharming for Farmaceuticals," 2010). But the problem with the present situation is that "the need is far greater than the supply, and there is also the possibility of unwanted contamination in any human blood-derived products" ("Pharming for Farmaceuticals," 2010, para. 18). From this, it can be said that the present way is inefficient, and cloning technology will be the solution.

Although the use of cloning technology is highly expected in medical use, there are opinions warning its use for army uses. In theory, cloning technology including the stem cell research can result in making human clones. To prevent this, there is a definite need for

governments to strictly ban the use of cloning technology in any kind of munitions, and limit its use to medical and environmental uses first. Furthermore, this restriction would not work only by the power of one country. For example, in 2005, the British government gave permission to use cloned human embryos for research purposes ("Dolly Scientist Gets Human Cloning License," 2005). At the same time, George W. Bush vetoed a measure to lift restrictions regarding uses of human embryos in research (Stolberg, 2007). Gaps between countries will make loopholes in the law, so international resolutions limiting the use of cloning technology and agreeing on the establishment of an authoritative surveillance organization will be essential.

Cloning is a brand new technology, and although it is risky and dangerous, it has the unlimited potential to save many lives. However, the limit of how far this technology is supposed to be developed (not *can* be developed) is still vague. For example, cloned embryonic stem cells can be grown as cloned humans. Will human cloning be allowed in the future? The answer to this question must be a definite "No." Everything has its limit, and if we are to go beyond that, it might be non-artificial humans that would become an extinct specie.

(1968 words)

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