

Somatic Cell Gene Therapy: a Leap in Technology and Reassessment of Values

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When we think of genetic engineering technology such as somatic cell gene therapy, grim thoughts come to mind regarding the consequences to the diversity of the human population. With an efficient method of physical transformation such as somatic cell gene therapy, physical changes in eye color, hair texture, stature, and weight will become as easy as obtaining contacts or hair dye. In somatic cell gene therapy any given gene may be replaced with an altered gene so that what is expressed by that gene is altered. The genes that are altered are only in somatic cells which means that the alteration is not passed on to future generations. Essentially, as long as the gene that encodes for the trait that one wants to alter is known, somatic cell gene therapy can be used to alter it. For example; if a person has heart trouble, gene therapy may be used to alter the DNA that codes for heart function. The new DNA code will then be expressed to “fix” the problem with the heart. This way it is not necessary to perform surgery, we merely reprogram the body’s instructions for heart maintenance.

This ease and availability of the technology will allow physical alterations to follow trends depending on what is fashionable at the time. One year blonde hair might be the popular trend, while another trend might be a slim figure. People will be driven by their need to fit into the norm, to follow these trends and alter their physical appearance using this technology, just as cosmetics are currently used. Certainly these possible consequences are only some of the extreme cases we might imagine, but they nonetheless remain a possibility if somatic cell gene therapy becomes readily available at the efficiency and effectiveness as is currently proposed.

It is important to consider the extreme scenarios when discussing the moral permissibility of somatic cell gene therapy, but we should be careful not to let these grim possibilities lead us to think that there is something inherently wrong with the technology of somatic cell gene therapy. What we must recognize is that somatic cell gene therapy does not present the possibility for morally impermissible consequences in virtue of anything distinct to its genetic technological basis. Rather, morally impermissible consequences such as those described are just as much a possible consequence of traditional medicine¹ as from genetic technology. We must come to terms with the fact that possible morally impermissible consequences do not result from an inherent evil in somatic cell gene therapy. They result from morally unjustified decisions made by humans in the application of

available self altering methods such as medicine or genetic technology.

Most share the same intuitions that something wrong is going on regarding the cases previously described, where vast trends in physical alteration run rampant in the population. However, it is not the fact that human DNA is being altered that gives us this uneasy feeling. It is the actual physical change that occurs with such ease and the effects it has on the mental states² of society that is wrong. Consider the case in which a new flavor of ice cream results in the physical alterations possible by somatic cell gene therapy. Clearly eating ice cream is not a morally impermissible action (in the relevant sense), but the possible consequence such as the fashionable physical alteration scenario previously presented does seem morally impermissible (or at the very least an undesirable scenario resulting from a morally impermissible action). This detachment of action and consequence seems to be merely a clever manipulation of language clearing DNA alteration of any blame. However, consider the following as a further elucidation. Ritalin is a traditional medical treatment used for ADD. It balances the chemical composition of the patient’s brain such that normal function results. The technological basis for the treatment and also the consequences of the treatment seem to be perfectly permissible as well as desirable. Now a possible scenario exists where Ritalin’s popularization leads many parents to misdiagnose their children with ADD and to request a doctor to prescribe their children Ritalin. This is no doubt an undesirable scenario caused by a morally

¹ *The definition of traditional medicine is unclear and at this point I do care to try to clearly define it. However, I use the term to refer to any form of medical treatment commonly used before genetic treatment was available. That is, medical treatment that does not alter one’s DNA sequence.*

² *By affecting mental states I mean to include cases such as when a person becomes self-conscious due to the trend in enhancing oneself. If big ears become unfashionable then those who do not change their ear size may feel outcaste.*

impermissible action. However, the immorality of the action is not in virtue of the technology of traditional medicine; it is in virtue of the unnecessary prescription of Ritalin to misdiagnosed children ultimately resulting from a popularization of the drug. In the same sense, the act of altering human DNA is not wrong, though its overuse based on personal inclinations such as the desire to fit-in is wrong. (Fukuyama 41-56)

This initial fear of somatic cell gene therapy is healthy and should not be overlooked, though it is important to realize its true cause. When we no longer cringe at the sound of “genetic engineering” the important issues at hand can be properly addressed. For this reason, I wish to show that in virtue of the moral equivalence of both the technological foundation of somatic cell gene therapy and traditional medical treatment, the moral standing of the application of each technology will also be equivalent. That is if it is considered morally permissible to treat a condition with traditional medical technology then it is morally permissible to treat a condition with somatic cell gene therapy (and vice versa).

We might think of somatic cell gene therapy as a very efficient and effective form of traditional medicine following all the same criterion of application as traditional medical treatment. This efficiency of genetic engineering may make immoral consequences easier, so this possibility should be taken into consideration. However, we must think of the immoral consequences as being merely a result of the abuse of the technology. It is important that the moral standing of somatic cell gene therapy is determined by its use by society. If this fact is taken to heart we will at least be able head in the right direction when addressing the permissibility of a given action. This way of looking at the moral permissibility will put the responsibility in the hands of people, where it belongs. If a certain way of using the technology is morally impermissible we then assess what can be done to prevent that form of use from happening. The point is that the evil is in the way it is used by people and not inherent in its technological foundation.

Accepting the equality in moral standing between traditional medicine and somatic cell gene therapy prevents one from arguing that gene therapy is morally impermissible because of what is called the “yuck factor.” In other words because it “seems wrong” or “is scary.” Rather, if we find that the condition is considered morally permissible to treat under traditional medicine then it is morally permissible under gene therapy. Do not think that any true problem has been solved here. We have merely shifted the burden of proof in regards to traditional medicine. Let’s say somatic cell gene therapy becomes effective in making an obese person have “normal” weight. When determining the moral

permissibility of this act we appeal to the moral permissibility of treating an obese patient with traditional medicine. It seems to be a widely accepted fact that treating an obese patient with traditional medicine is morally permissible so we would thus conclude it is morally permissible to treat that patient with somatic cell therapy. However, we must be careful not to jump to this conclusion so soon. It may be the case that the treatment of the obese patient with traditional medicine is widely accepted, but how was this determined and is it really morally permissible? We must reanalyze the moral permissibility of this action even with traditional medicine. It is as if traditional medicine has developed over the years unquestioned as far as its moral standing. It is at this time, at this genetic leap of technology, that we must take a step back and rethink the permissibility of what we so quickly accepted in the past. We must take it upon ourselves to use our rational thought to determine the moral permissibility of these actions and we must not be afraid to drastically revise our applications of medicine should need be.

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If we cannot determine the moral permissibility of the genetic treatment of a condition by appealing to what is commonly accepted as permissible for medical treatment then what sort of criterion of application must we appeal to? Ideally the moral permissibility of the treatment of a given condition would be determined by referencing a set of rules. In a perfect world we could merely input any scenario of moral question into what might be called “the algorithm of morality” and see whether the output read “morally permissible” or “morally impermissible.” However, we will find that no such perfect world is even possible. No matter how complete a set of moral rules governing the application of medical treatment, there will always be cases that fall in the grey areas of the algorithm. In other words there will be cases that are not clearly permissible or clearly impermissible when the rules are taken into consideration. Rather, their permissibility is open to debate and will be equally capable of justification for its permissibility or impermissibility depending on value judgments as opposed to an appeal to a set of rules. Is it then hopeless to even attempt to determine which conditions are permissible to treat in virtue of this impossibility to develop an algorithm of morality? The best that can be done is for a set of rules to be laid out as a good approximation to this ideal algorithm. Certainly cases will fall in the grey area of the set of rules thus allowing an argument based on value judgments to proceed either way. For this reason, it is important in addition to the set of rules (even more important than the rules themselves) to educate society of the types of things to consider when making value judgments, so that our intuitions may more closely approximate what our rationale dictates.

A moral intuition can be thought of as “what seems right.” Our moral intuitions are based on a societal conditioning of what is commonly accepted as permissible. We might say that our intuition that somatic cell gene therapy is immoral is based on the commonly held “uneasy feeling” that people have because somatic cell gene therapy just “doesn’t seem right.” However, this appeal to intuition makes the same mistake that we do when we assume that the treatment of a condition is moral because it has always been widely accepted as moral. The problem is that the moral permissibility of the treatment was never assessed in the first place, it was merely accepted. What we must do is rationally compose a definition or set of guidelines for what is to be considered a condition morally permissible to treat. This definition will in no way be the algorithm of morality previously discussed, but will be an approximation (for this reason “guideline” rather than “definition” is a better descriptive word). When we describe a condition as being a disease we mean to say that the condition falls into these guidelines as a whole. That is, the guidelines are the definition of “disease.”

There are several ways to approach the definition of disease for the purposes of discussing the moral permissibility of gene therapy. It seems as though our main goal is to define disease such that anything that qualifies as a disease would be morally permissible to treat with traditional medicine, therefore somatic cell gene therapy, and anything that does not qualify as a disease would not be morally permissible to treat. In this case it may be misleading to refer to what we set out to define as “disease.” So for now on I will refer to the concept we set out to define as “ailment.” We want the definition of ailment to capture our intuitions as to what should be acceptable to treat with traditional medicine and what should not be acceptable. In “The Concept of Genetic Malady,” Culver uses this sort of a strategy to establish his definition of disease. There are certain aspects of Culver’s approach to our desired definition, which he terms “malady,” that are essential to an adequate definition of ailment. The elements that make up Culver’s definition of malady are necessary to a definition of ailment, but are not sufficient. That is, everything that we want to call an ailment fits into the definition of malady, but some things that we do not want to call an ailment also fall into the definition of malady.

I shall highlight the main points in Culver’s article that adequately encompass the intuitive elements desired to be described by our definition of ailment. The most obvious element of our definition is that it must describe some “harm or evil.” To use Culver’s idea, an ailment must be something that any rational person would find to be undesirable. All rational persons must conceive of an ailment as something

unwanted unless there is a greater benefit to come from having the ailment. The common cold should still be considered an ailment even though a school boy with this ailment would consider it a good thing to have because it allows him to stay home from school. We also want to use Culver’s idea to say that an ailment must be caused by something within the body of that person. Certainly an ailment can originally be caused by something external to the body as long as the external stimuli has significantly affected the person’s body such that the ailment is present after the original external stimuli is gone. So the undesirable annoyance of a fire alarm is not an ailment because the harm is gone when the ringing stops. However, if the fire alarm caused a physical change in your eardrum such that you were deafened from then on, the deafness would be considered an ailment caused by an improperly functioning eardrum which in turn was caused by a loud fire alarm.

Another contribution by Culver to the definition of ailment is that we must not consider an unwanted harm to one’s body based on rational beliefs to be an ailment. My action of driving fast cars may put me in a situation of unwanted harm, but this action is made on a foundation of rational thought. I make a rational decision to put myself at this risk so it is not considered an ailment. However, the irrational belief that the government is trying to kill you can be considered an ailment because it counts as something unwanted by a rational human and is caused by something internal to the body (i.e., an internal chemical imbalance).

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Finally I would like to substitute the last part of Culver’s definition of malady for Boorse’s concept of health as portrayed in Caplan’s article, “The Concepts of Health and Disease.” We will say that a person is healthy if they are without ailment. More specifically a person is healthy if their body is functioning in the manner selected for by natural selection. In this way, for something to be an ailment it must not only satisfy all the above qualifications, but it also must be a variance from the normal bodily function that a specific part or parts of your body has evolved to have. This emendation to Culver’s definition allows for something to be considered an ailment even though the entire population has it. If everyone were to simultaneously break their arm, everyone would be considered to have an ailment even though relative to one another there has been no fundamental change in health. Even though there is no deviance from the societal norm there is a deviance from the normal function of the arm “intended” by natural selection.

Although the definition of ailment picks out all the extreme cases desired to be described by the term, there are some conceivable cases which are not covered. Take into consideration a person who has a lung disorder such that when breathing air of oxygen

levels lower than X amount, their lungs do not take in enough oxygen to survive. If we say that the normal atmospheric levels of oxygen are below X then we would say that this person has an ailment. They suffer a rationally unwanted harm immediately caused by an improperly functioning internal body part. However, we can argue that the cause of this ailment is not ultimately the improperly functioning lung, but the insufficient amount of oxygen in the atmosphere. After all, if we were to change the physical external environment such that the level of oxygen was well above X amount, then the person's lungs would be working just fine. This shows that the harm brought to the person is not necessarily based on an internal cause. We certainly do want this lung problem to be considered an ailment and thus allow the person who suffers from it to receive gene therapy. But if we allow this to be considered an ailment what keeps us from considering the fire alarm ringing in our ears to be an ailment. There must be a line drawn as to what we consider to be an external cause of ailment.

Major problems become immediately apparent when we start considering the specific grey area cases. There is always the line that needs to be drawn as to what our values say is permissible and what is not. We may even find a condition that our rationale and values tell us is permissible to treat yet is not included in the definition of ailment such as the lung disorder

previously mentioned. In this case we would then broaden our definition of ailment to include this condition. The problem is that we are merely fooling ourselves into thinking that the definition of ailment is something predetermined. The definition of ailment is not a rigid set of rules based on a priori reason; they are actually being created as we go. The definition is still important to use as guidelines, so long as these guidelines are called into question every time they are used. If we appeal to a rule without question whenever we want to determine the moral permissibility of an action it is like we are allowing a machine to decide for us. We merely input the condition of question and out pops the moral verdict, without any human thought required. However, we should make the moral decision, and make it every time for specific cases. No general rule can pick out every case so let's not be fooled into thinking it will. Let us accept the definition of ailment for what it is, a set of guidelines not a moral algorithm. Further, let us put the cause of moral permissibility in its proper place; in the hands of humans not in the so called inherent evil of the technology itself. When we finally take responsibility then we will at least be on the right track to addressing the permissibility of somatic cell gene therapy.