Religious traditions frequently inform the contexts that shape how believers morally decide complex bioethical topics, and this certainly has been the case for the Roman Catholic community. There is a substantial number of documents from this religious tradition that have been produced on the scientific and medical interventions into the human genome, and the teachings found in these documents have illuminated the way Catholic believers have morally thought about and judged manipulations of the human genetic code.

Before discussing how the Roman Catholic moral tradition has approached the recent discoveries in genetics and the Human Genome Project, however, it would be helpful to name and describe the areas within genetic science that are or will be in need of moral evaluation. Medical scientists could conceivably develop four different types of human gene transfer from the results produced in the Human Genome Project.¹ In other words, within the next twenty or thirty years medical science will have the capacity to alter our genetic code in four ways. The first two types are therapeutic in nature because their intent is either to correct some genetic defect that causes disease or to prevent future disease. The other two types are not

therapies at all, and many question whether they are part of medicine’s goals as well. Rather, they are concerned with improving either various genetic traits of the patient him/herself (somatic cells) or with permanently enhancing or engineering the genetic endowment of the patient’s children (germline cells).

The first kind of human gene transfer is somatic cell therapy, in which a genetic defect in a body cell of a patient could be corrected by using various enzymes (restriction enzymes and ligase) to splice out the defect and to splice in a healthy gene. Medical scientists have already used a variation of this technique to help children who suffer from severe combined immune deficiency (ADA) by modifying bone-marrow cells, and a similar procedure was used in August 1999 for children who have Crygler Najjar syndrome, a genetic disease that causes fatal brain damage. Estimates are that between two and five thousand different genetic diseases are controlled by one gene, and these diseases afflict approximately two percent of all live births. Second, there is germline gene transfer therapy in which either a genetic defect in the reproductive cells—egg or sperm cells—of a patient would be repaired or a genetic defect in a fertilized ovum would be corrected in vitro before it is transferred to its mother’s womb. In either case, the patient’s future children would be free of the defect by permanently altering their genetic code.

Next there are the two kinds of nontherapeutic or enhancement human gene transfer. The first kind is enhancement somatic engineering. In this type, a particular gene could be inserted to improve a normal trait, for example, the insertion of a new gene or an improved one to enhance memory. Second, there is germline genetic engineering in which existing genes would be altered or new ones inserted into either germ cells or into a fertilized ovum such that these genes would then be permanently passed on to improve or to enhance traits of the patient’s offspring. In this last form of human gene transfer, parents could design their children according to their own desires.

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3Pamela Schaeffer, “Special Report: Body and Sold,” National Catholic Reporter, October 22, 1999, 22. It should also be noted that a similar technique was proposed by the scientists who cloned five piglets on March 5, 2000, in Blacksburg, VA, for xenotransplantation of pig organs to humans. These scientists intend to “knock out” a specific gene responsible for adding a sugar group to pig cells. This sugar group is foreign to the human immune system, so the unaltered organs would be rejected in the human body. Additionally, the scientists would introduce through gene transfer three new genes into the cells of the cloned pigs to control the causes of organ rejection. See Marjorie Miller, “5 Pigs Cloned: Transplants to Human Touted,” Los Angeles Times, March 15, 2000, A1 and A11.


In light of these four types of human gene transfer, I will begin with a very general conclusion about the Roman Catholic perspective on genetics and genetic interventions. With the exception of human cloning,\textsuperscript{7} \textit{in principle}, there is nothing in the Catholic tradition that theologically or morally prohibits interventions into the human genetic code, though in fact there may be circumstances in which a specific intervention might be immoral.\textsuperscript{8} To prove this conclusion I will focus my attention primarily on documents from the magisterium or teaching authority of the Catholic Church, i.e., documents from recent popes, bishops, and the Second Vatican Council. I will augment these teachings on occasion with various positions taken by Catholic theologians and bioethicists.

I will proceed by analyzing three sets of issues that are at stake for the Catholic tradition on the topic of human gene transfer. These three sets are: 1) anthropological issues, 2) theological issues, and 3) moral issues. My analysis of each must necessarily be brief. Though I realize there is an important dispute about what constitutes a “therapeutic” end and what constitutes an “enhancement” of the human genome,\textsuperscript{9} I will limit most of my remarks to the area of the therapeutic, i.e., interventions to cure or to prevent a disease. In the conclusion I will offer a brief summary of some definite positions taken by the Roman Catholic tradition on alterations of the human genome.

\textbf{Anthropological Issues}

There are several background beliefs about the human that function as starting points for a moral discussion of gene therapy, but I will mention only two. First, the Roman Catholic tradition consistently argues not only that the nature of the human person is both body and spirit but also that there is a oneness among these distinguishable but inseparable aspects. As the Pastoral Constitution on the Church in the Modern World (\textit{Gaudium et Spes}) states the matter: “Though made of body and soul, man is one.”\textsuperscript{10} The current pope, John Paul II, has reiterated this belief in


\textsuperscript{8}One Catholic theologian who argued for this conclusion was Karl Rahner, S.J. For two of his most influential essays in this area of genetics, see “The Experiment with Man,” in his \textit{Theological Investigations}, vol. IX, trans. Graham Harrison (New York: Herder and Herder, 1972), 205–224; and “The Problem of Genetic Manipulation,” in the same volume, 225–252.

\textsuperscript{9}For example, see Eric T. Juengst, “Can Enhancement be Distinguished from Prevention in Genetic Medicine?” \textit{Journal of Medicine and Philosophy} 22 (April 1997): 125–142.

several statements on genetics. For example, in his 1982 address to the Pontifical Academy of Sciences, the pontiff claimed that “the human body is not independent of the spirit, just as the spirit is not independent of the body, because of the deep unity and mutual connection that exist between one and the other.” Thus, any genetic intervention into the human subject must recognize and respect this unity; any view that separates the two is dualistic and leads to a denigration of one or the other of the two aspects of the person.

Second, the Catholic tradition argues that there are various kinds of goods whose pursuit of and acquisition by persons will define their well-being and flourishing. Two of these goods are particularly important here: life and health. In their working report on genetic intervention, the British bishops argued that “to be fulfilled in our existence as human beings requires some degree of bodily well-being. Health is a good which is a dimension of the basic good of life.” Thus, if health is a basic good that all pursue, even though there are definite limits to this pursuit, the nature of this good itself becomes the ground for the prima facie obligation on the part of both patients and physicians to seek remedies for genetic diseases. The role of medicine, then, is to serve health, and the technological means by which medicine realizes this good are ultimately subject to the objective standards of morality, which themselves are based on the nature of the human person in all its dimensions.

Theological Issues

There are two distinctively theological issues that serve as interpretive frameworks for the morality of gene therapy. The position one takes theologically on each of these issues will inform and shape how one reasons morally about genetic interventions.


13In the Roman Catholic theological tradition, to designate any potential medical intervention as “extraordinary,” i.e., that there is a disproportion between the benefits and burdens to a patient, would constitute a limit to the obligation that the patient would have to pursue that intervention. For a further discussion of the principle of proportionate versus disproportionate means (ordinary vs. extraordinary means), see the Congregation for the Doctrine of the Faith, “Declaration on Euthanasia,” Origins 10 (August 14, 1980): 154–157, at 156.

14The argument that the nature of a good itself grounds the prima facie moral obligation to pursue the good is based on a theory of natural law. For a helpful discussion of natural law theory within the Roman Catholic tradition, see Richard M. Gula, S.S., Reason Informed by Faith: Foundations of Catholic Morality (New York: Paulist Press, 1989), chapters 15 and 16.

15John Paul II, The Redeemer of Man, Redemptor Hominis (Boston: Pauline Books & Media, 1979), n. 16. The argument that the objective standards of morality are based on the nature of the human person originates from Gaudium et spes, n. 51. For a very helpful
The first issue concerns a question about whether or not we are “playing God” by intervening in the human genome in order to cure or prevent genetic diseases.\(^{16}\) This question obviously has definite anthropological implications, because at its core it is asking about the responsibility that we humans should or should not have over material reality, including the materiality (e.g., genes) of our own bodies. If the divine has not decided to share with us the dominion over our bodies but has reserved such dominion to itself, then it would seem that any act to change what God has given us in our bodies would be an improper exercise of human freedom and thus an act of “playing God.” On the other hand, if one believes that God has indeed granted this responsibility to humans, then it would seem that we have at least a prima facie moral obligation to alter our genetic makeup for therapeutic ends. Such acts in this latter view, then, would not be improper acts of “playing God”; rather, they represent the rightful taking up of our responsibility for the goods of life and health.

For the most part, the current pope, and much of the Catholic tradition, has argued rather strongly for the view that we humans, within certain moral limits, have been granted by the Divine the responsibility over material nature, including our own genetic heritage.\(^{17}\) Consequently, as long as researchers respect the nature of the human person, a moral criterion that I will develop below, at least therapeutic genetic interventions are theologically permitted in the Catholic community.

The second theological issue concerns the question of whether or not a special sacred status should be conferred upon the human genome or DNA either because of its intimate connection to human reproduction and development or because of its participation in the image of God (\textit{imago Dei}) that resides in us.\(^{18}\) If yes, then any intervention into our genetic code would constitute an improper act on the part of medical scientists. If no, then in principle our genes are like all other aspects of the discussion of “the human person integrally and adequately considered,” see Louis Janssens, “Artificial Insemination: Ethical Considerations,” \textit{Louvain Studies} 8 (Spring 1980): 3–29.


\(^{17}\)For example, see John Paul II, Redeemer of Man, n. 16; and the Congregation for the Doctrine of the Faith, “Instruction on Respect for Human Life in Its Origin,” Intro., n. 2.

\(^{18}\)Though their focus was not on genetic interventions but on the patenting of genes, two Protestant theologians in the Southern Baptist community have recently argued for the special sacred status of genes based on the belief that the image of God (\textit{imago Dei}) pervades all aspects of human life, including one’s genes. See Richard D. Land and C. Ben Mitchell, “Patenting Life: No,” \textit{First Things} 63 (May 1996): 20–23, at 21.
created material world and thus possess no special sacred status. The Catholic tradition has understood the status of the human genome in terms of the latter view. For example, in their document on genetic intervention, the British bishops ask if the genome is morally untouchable by virtue of its special role in human development. Their answer,

We would argue not, in view of the fact that the genome is simply one highly influential part of our bodies: the part which directs the formation of other parts, both in ourselves and in our offspring. We believe that, like other parts of the body, the genome may in principle be altered, to cure some defect of the body.\footnote{British Catholic Bishops, Genetic Intervention on Human Subjects, 32, original emphasis.}

Edmund Pellegrino, M.D., and Joseph Cassidy, O.P., have also argued for a similar position. They claim that human genetic material is a cause of great wonder, but in itself it does not deserve any special status such that interventions into our genome would per se constitute immoral acts.\footnote{Joseph D. Cassidy, O.P., and Edmund Pellegrino, M.D., “A Catholic Perspective on Human Gene Therapy,” International Journal of Bioethics 4.1 (1993): 11–18, at 12.} Consequently, from a strictly theological perspective, the Catholic tradition would not prohibit interventions into the human genome for purposes of curing or preventing a genetic disorder.

**Moral Issues**

Documents from the magisterium,\footnote{For example, see Pius XII’s 1953 address on genetics, “Moral Aspects of Genetics,” in Medical Ethics: Sources of Catholic Teachings, 3d ed., eds. Kevin D. O’Rourke, O.P., and Philip Boyle (Washington, D.C.: Georgetown University Press, 1999), 170–171.} especially those from the current pope, reveal a remarkable positive evaluation of genetic interventions. These texts demonstrate an awareness of the difference between somatic cell and germline cell interventions. The distinction between therapy and enhancement is acknowledged as well. In principle, none of these in themselves is judged morally wrong, but each must be judged according to moral standards. Some of these standards are established moral principles; others serve as the foundation for the moral principles. In what follows, I will list and briefly analyze four of these moral standards in relation to the various types of genetic intervention.

**Do Good, Avoid Evil: The Fundamental Moral Imperative**

Following Thomas Aquinas’s discussion of the natural law in the thirteenth century, this moral standard in the Catholic tradition has been considered the foundation for all moral principles.\footnote{Thomas Aquinas, Summa theologiae, trans. the Fathers of the English Dominican Province (New York: Benzinger Brothers, Inc., 1947), I-II, Q. 94, a. 2.} In the present discussion, the particular goods that we are to pursue are the goods of life and of health. The nature of these goods ground the prima facie obligation to pursue them on behalf of ourselves and on behalf of others. However, we are only strictly obliged to avoid harm; we do not
have a strict obligation to accomplish all good. This understanding of our obligations clearly indicates that a good end does not justify a morally bad means and that a strict risk-benefit calculus is not the sole perspective from which to judge the moral appropriateness of genetic interventions.

Genetic Interventions and Respect for the Dignity of the Human Person

This is clearly the most fundamental moral principle that applies to our discussion of genetic intervention, and it takes various forms in the documents under consideration. In its most general terms, science and technology require *for their own intrinsic meaning* an unconditional respect for this principle. Respect must be present from the very moment of conception, and it requires that we not reduce life to a mere object. Scientific interventions into the human genome respect the integrity of the person when they focus on benefits for the patient. Thus, genetic experimentation on human subjects, including embryos, can be justified morally as long as there is informed consent (by the patient or by a proxy) and the experiments avoid harm and are directed to the well-being of the person. Furthermore, experiments that are not strictly directed toward therapy but are aimed at improving the human biological condition (enhancement) can be justified, at least in part, on the grounds that the experiments respect the human person by safeguarding the identity of the person as one in body and soul (*corporae et anima unius*). However, genetic experiments that are directed toward sex selection or other predetermined qualities and those directed toward the creation of different groups of people are forbidden morally because they violate the dignity of the person.

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25For example, see *Gaudium et spes*, n. 51; and the *Catechism of the Catholic Church* (New York: Paulist Press, 1994), n. 1700.


29*Donum vitae*, n. 4; and Friend, “Frontiers of Genetic Research,” 523.


Genetic Interventions Must Promote the Well-Being of the Patient

I have already alluded to this standard above, but it does have the status of a distinct moral principle in the Catholic tradition. John Paul II has used it in part to justify morally the use of therapeutic genetic interventions to cure disease. Likewise, the Science and Human Values Committee of the National Conference of Catholic Bishops has used this principle in permitting genetic testing for a cure or effective therapy of genetic diseases.

Proportion between Risks and Benefits

This is an important moral principle that applies to this topic, though most of the documents studied reject this as the sole principle that would apply to genetic interventions. The risks and benefits must be calculated in terms of their potential impact upon a patient’s well-being and not in terms of their impact on existing others or future humanity. In the end, if the benefits to the patient reasonably outweigh the risks, then this proportion can in part justify genetic interventions.

A Positive Assessment

There are a substantial number of documents from the magisterium of the Catholic Church that have been produced on the topic of scientific and medical interventions into the human genome. With the exception of human cloning, for the most part, these teachings have been quite positive in their evaluation of these potential technologies. By way of conclusion, permit me to summarize the results of my analysis in relation to genetics in general and to gene therapy in particular.

First, it seems clear that the Roman Catholic tradition would not only morally permit but would strongly encourage the development of somatic cell therapies as long as these interventions do not violate any of the anthropological, theological, or moral issues discussed previously. In principle, these therapies raise no new moral problems that have not already been dealt with in other types of medical interven-

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33Ibid. Also see idem., “Genetic Research Must Benefit Every Human Life” (February 24, 1998), address to the members of the Pontifical Academy for Life, L’Osservatore Romano (English), March 18, 1998, 5. In this address, the Pope argues that genetic interventions into somatic cells are permissible because scientists in 1998 have claimed that these procedures are safe. Of course, the fatal genetic interventions performed on Jesse Gelsinger at the University of Pennsylvania had not yet occurred when the Pope delivered this address. The pope further asserts in this address that in fact these procedures do not seem safe on germline cells or on early embryos, and thus they are not permissible. Also, idem., “The Human Person Must Be the Beginning, Subject andGoal of All Scientific Research” (October 28, 1994), address to the Pontifical Academy of Sciences, L’Osservatore Romano (English), November 9, 1994, 3, 15.


tions to cure or prevent disease. The goods of life and health ground a prima facie moral obligation in the Catholic tradition to pursue research in this area of therapy.

Second, there seems to be an emerging, but not absolute, consensus that germline therapy, if that were ever to become a possibility, would not be considered in principle unacceptable. There are several qualifications that need to be made on this claim, though. It is important to note that this is an “in principle” argument; de facto or in practice, germline therapy is currently considered unacceptable for several reasons. For example, such therapy would be developed only after experimenting on embryos and exposing them to great harm. In addition, even if one clearly distinguishes gonadal cell germline therapy from embryonic cell germline therapy, there are still problems. As the Catholic Health Association in the United States has noted, gonadal cell therapy would have to be justified on the grounds of possible beneficial results for future humanity, since this type of intervention does not alter the genetic makeup of the “patient.” This form of justification seems to violate, at least in a prima facie sense, the moral principle espoused by the Catholic tradition that any intervention should be for the benefit of the patient him- or herself and not for the benefit of some future humanity.

Finally, there is the possibility of genetic enhancement to improve the human. Though there has not been much written on this specific type of genetic manipulation from the perspective of the magisterium or official teaching authority of the Catholic Church, nonetheless at least John Paul II has not ruled it out of hand by declaring it intrinsically immoral. Rather, he seems to be open to such developments as long as they do not violate the moral principles I have already outlined.

36For example, see the Catholic Health Association, Human Genetics, 19; British Catholic Bishops, Genetic Intervention on Human Subjects, 28; and James F. Keenan, S.J., “What Is Morally New in Genetic Manipulation?” Human Gene Therapy 1.3 (Fall 1990): 289–298, at 292.

37For example, see British Catholic Bishops, Genetic Intervention on Human Subjects, 34.

38Ibid., 42–43. For additional reasons, see the Catholic Health Association, Human Genetics, 20–21.

39Catholic Health Association, Human Genetics, 21–22.