

Islamic Perspectives on Cancer Genetics and Gene Therapy

KANSER GENETİĞİ VE GEN TEDAVİSİ KONUSUNDAKİ İSLAMİ GÖRÜŞLER

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Summary

Islamic ethical decisions allowing procedures or actions in the field of genetics vary according to the purpose they aim to serve. The guiding principle in the sacred law of Islam is that there is seldom a thing of benefit without some inherent disadvantage affecting one's religion, body or property. Islam's concern to combine noble ends with noble means rules out the idea of good end justifying a corrupt means. Taking the specific case of genetic engineering, the most important rule is avoidance of anything that might affect human nature and human relationships. Islam forbids any tampering with human nature in any way other than legitimate methods of correction. Anything that is done for prevention or as treatment is legitimate. Ethical judgment on any medical procedure is made on the basis of predominance of benefit.

Key Words: Islamic ethics, Cancer genetics, Gene therapy

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Özet

İslam etiğinde genetik alanında yapılacak olan işlemlere ve uygulamalara izin verilip verilmeyeceğine dair karar işlemin ne amaçla yapıldığı ve ne işe yarayacağına göre değişir. İslam dininin rehber prensipleri, özünde yarar barındıran herşeyin içinde insanın dinine, bedenine veya mülküne karşı bir dezavantaj içerdiğini kabul eder. İslam'ın soylu sonucun ancak soylu yollardan elde edilmesi gerektiği düşüncesi, iyi sonucun gayrimeşru yöntemi meşru yapacağı düşüncesini tamamen ortadan kaldırır. Genetik mühendislik örneği üzerinde konuşulacak olursa, sakınılması gereken en önemli şey insanın doğasının ve ilişkilerinin olumsuz etkilenmesidir. İslam, meşru düzeltme ameliyeleri dışında insan doğasını etkileyecek her türlü girişimi yasaklamaktadır. Tedavi ve korunma için yapılan herşey meşrudur. Uygulanan her türlü tıbbi girişimin etik yargılaması yararlı olma esasına göre yapılır.

Anahtar Kelimeler: İslam etiği, Kanser genetiği, Gen tedavisi

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As we begin to understand Muslim perspectives on gene therapy it is important to keep in mind that in the absence of an officially organized and recognized theological body, resembling, for instance, the Pope or Vatican Council in Catholicism, there is no single authoritative voice, nor one particular council of *ulema* (religious scholars) like *Dar al-ifta'* (the Center for Issuing Religious Decisions) in Cairo, that speaks for the entire tradi-

tion or world wide community. Muslim community is divided into two distinctive legal-ethical schools represented by the majority *Sunni* and the minority *Shi'i* communities. In the area of religious-ethical practice the *Sunnis* are further divided into four legal-religious schools with varying rulings about practical matters for social policy. Hence, in our search for views on gene therapy I will avoid identifying particular views as being strictly *Sunni* or *Shi'i*. In emerging ethical issues it is not unusual to find contrary views about gamete reproduction and microbiological techniques which are still not fully understood by the practitioners of religious reasoning founded upon scriptural sources, namely, the Koran and the *Sunna* (Tradition) traced back to the Prophet Muhammad.

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In Islamic thought when framing questions regarding medical treatment the language of obligations, duties and interpersonal justice takes precedence over the language of private and autonomous individual rights. While there is an absolute obligation to save human life, the principle of public good (*maslaha*) demands that an individual's life must be weighed in the scale of general well being of those who are horizontally related to the patient. The other regarding responsibility requires to take into consideration an individual's interpersonal relationship with his own family and society in general. If active medical intervention in the case of a patient leads to further suffering of the patient and those related to him in society, then the ethical judgment cannot ignore issues of justice, access, distribution, and implications of the medical intervention on the human community in which the society shares resources, including the rising cost of preventive medicine. Availability of affordable resources, both human and technological, to sustain a patient's life must be assessed in terms of collective social needs founded upon the principle of distributive justice. In other words, benefits of medical intervention must be open to all.

Principles of justice and utility as known in the secular bioethics would be hard to implement in the case of inclusiveness and community-oriented nature of Islamic ethics of medical treatment. Moral problems connected with the allocation of scarce resources in majority of Muslim societies in the Third World remain unanswered because of authoritarian and paternalistic nature of health care in these countries. However, the requirement to adhere to the principle of equal worth of human life by a mere fact of being human suggests that no human life can be treated lightly when it comes to the distribution of limited medical resources.

Illness as a Form of Suffering and Human Responses to it

Human beings have struggled with the question of suffering and its elimination at all times. Despite the efforts of an increasing number of Muslims and Christians to break down the intransigent situation caused by evil and injustice, there is no immediate prospect of any considerable change. In its attitude to suffering Islam represents the

Western tradition in a positive and confident form. The facts of suffering are clearly recognized, but in general are regarded as instrumental in the purposes of God. Suffering reveals God's purposes for humanity. The two elements of the power of God and the responsibility of human beings lie side by side, but they are held together in a sufficient doctrine of creation.

One of the earliest and most persistent theological problems in Islam was the need to reconcile two elements in creation: omnipotence and freewill. In that discussion, the question of human responsibility inevitably arose, and with it the question of whether suffering was or was not deserved. To all appearance, the main attitude of Islam was in favor of God determining the occurrence of suffering and knowing of it in advance, as the following narrative of human embryonic journey to personhood suggests:

Truly each of you is formed in his mother's womb for forty days, then he becomes a clot for the same length of time, then he becomes formed flesh for the same length of time. An angel is sent to him with four commands, for his sustenance, the length of his life, whether he is to be wretched or happy, (and his work) (1).

But a strong reaction set in against this over-emphasis on the omnipotence of God, which in effect was in danger of reducing human being to puppets. While emphasis on God's power could be spiritually helpful if taken to mean no more than that God was and is a beneficent maker and provider; it reduced human being to the status of puppet who is moved about pointlessly on the stage of human existence. Muslim rational theologians maintained that humans initiate their own action and thus determine their destiny. God remains in control, but He delegates actions and thus responsibility to human beings.

The tension between the two attitudes is reflected in the reality of human life. For many Muslims suffering is not an academic problem but a fact of life. Should human beings take upon themselves to alleviate suffering where possible or accept it as a trial and as a chastisement for sins already committed? There is a repeated emphasis in Islamic teachings that suffering, especially sickness, pa-

tiently endured remits sins (2). Nonetheless, there are also traditions that make clear that every effort should be made to alleviate suffering. These distinct expressions of faith in God's power and human freewill have been shaped within different cultural settings where Islam remains the controlling factor, but it accommodates and absorbs a great deal of what those cultures hold valuable. Thus Muslim struggle to understand the mysteries of life shares the common struggle of humanity to explain what human conditions were determined and what were possible to change.

Modern science and technology has uncovered a more flexible set of natural conditions that can be explored, explained and even changed for the betterment of human life. It is in this area of uncovering the derivation of certain conditions that affect human health that we find serious work in genetics has produced unparalleled technological innovation that challenge the way we understand what it means to be human and distinct from other species. Scheduled to be fully completed by the year 2006, the Genome Project initiative aims to make a detailed map of human DNA, the hereditary information in which one's genetic makeup is stored. With this knowledge will come benefit to society, for its members will begin to under the etiology and several genetically transmitted diseases. Yet, with the greater ability to differentiate both at superficial and molecular level, individuals will come to possess the ability to draw distinctions between themselves and others, a practice that may lead to discrimination along the lines of those distinctions. Laden with both promise and problem, as our understanding of genes grows so does our ability to manipulate them. The possible impact of the project on the fundamental elements of human characteristics and heredity warrants careful consideration. The gains to be made in preventive medicine and research for cures to genetic diseases such as SCID (Severe Combined Immune Deficiency) and cancer need to be weighed in relation to the detriment its results may potentially cause, such as provoking a new type of discrimination, both in health care and employment, a resurgence in eugenics, and a profound shift in the nature of human relationships (3).

The fear prompted by the clinical use of genet-

ic interventions has led to set limits on research and testing that dealt with human DNA. The technology itself being in its experimental stages has not been able to clearly foresee potential harm connected with highly risky procedures. The mere intervention into human DNA seems to tamper with what are regarded as basic building blocks of human life. Moreover, much of the proposed research on human molecular biology depends upon the uses of gametes or early embryonic tissue, and since such use involve questions of abortion and human fetal personhood, the research involving the use of human embryonic tissue to explore and manipulate human DNA is seen as a violation of fundamental moral principles.

But the enormous potential of such genetic intervention is powerful incentive to engage in genetic etiology of many complex human disorders. As the practical technical skills of genetic scientists improved, private corporations have continued to fund university researchers and the work on human genome and embryonic cellular manipulation has continued. In fact, the research in human embryonic stem cells and the possibility of successful germline intervention have proceeded swiftly, and recent breakthroughs in this technology has raised questions about the ethical implication of such interventions in the clinical context.

The moral consideration and concern in Islam in dealing with the technology behind establishing the relationship between susceptibility to disease and the accuracy of genetic testing have been connected, however, with fetus and its development to a particular point when it attains human personhood with full moral and legal status.

The inception of embryo life is an important moral and social question in Muslim community. Anyone who has followed Muslim debates over this question notices that the answer to it has differed with the different ages and in proportion to the scientific information available to Muslim legal scholars. Accordingly, each period of Islamic jurisprudence has come up with its ruling (*fatwa*), consistent with the findings of science and technology available at that time. The search for satisfactory answer as to when embryo attains legal rights has continued to this day.

Legal-Moral Status of Embryo in Islamic Law

Legal-moral status of an entity is described in terms of its relation to other moral agents, and the obligations and relationships that other moral agents have toward this entity. If fetal tissue is treated as organic non-human life form, then it might be permissible to use them for research with compelling reasons and just ends. On the other hand, if human embryonic cells are considered human entities then our moral relationship and obligation toward them shifts sharply. In Islam fetus is guaranteed legal rights by Islamic Law, and the evidence is abundant in many sections of Islamic jurisprudence. Moral status of the child-to-be puts constraints in medical research because of our obligation to another entity that is not capable of protecting itself and consenting to its use for research purpose. In the *Shi'i* moral tradition, like the Catholic formulation, eradication of fetus is a sin. This raises serious questions about the uses of fetal tissue in deriving the necessary stem cells for therapeutic use.

That the fetus has a moral-legal status in the legal corpus cannot be questioned. In the matter of inheritance, the *Sunni* and the *Shi'i* jurists have ruled:

(a) If a man dies and a pregnant wife survives him, the right of the fetus is secure, and the inheritance cannot be disposed of before the share of the fetus is set aside. If the wife delivers more than one baby, the legatees have to pay back the share of the others.

(b) If a woman aborts a fetus, at any stage of its life, and it betrays any sign of life, such as a cough, sneeze, or finger movement, etc., the fetus is entitled to inherit any legitimate legator who has died after its conception. If the fetus does not survive, its legal legatees inherit its share.

In the matter of abortion, the jurists have ruled that since Islamic Law guarantees the sanctity of fetal life it protects a fetus against deliberate abortion without legitimate excuse. We even come across the ruling that if a pregnant woman is sentenced to death, execution is postponed until after delivery, and according to some jurists, until the mother completes nursing the child (4). The para-

digm case is provided by Prophet Muhammad who postponed the stoning of a pregnant adulteress until the child was born. The same case has been further extrapolated to rule that illicit conception does not justify abortion. In its penal code the Islamic Law does not regard the embryo in its early stages simply a dormant mass. The treatment of both induced or accidental abortions, in the form of interdiction, admonition or penalties indicate that Islamic Law recognizes human dignity at conception. It safeguards the life of a fetus, as well as its rights, while it is still in the womb.

These days, however, with all the social changes and scientific findings, we find ourselves before an open window, with hands almost reaching into tamper with the lives of fetuses. Permission and prohibition seem to be obscured by the interpretations of modern science concerning fetal growth, stages, and movement, as well as the inception of embryonic life. Muslim jurists in classical age attempted to determine the time when embryonic life began. Modern methods of fetal diagnosis, such as fetoscopy, ultrasound, and other means for examining a fetus and monitoring its growth inside the uterus, were not available to them. These scientific methods allow us now to see the embryo inside the mother's womb from the earliest moments and to follow its growth, hour after hour and day after day, until it fully grows into a human being.

Muslim legal opinions of earlier times maintained that the life of a fetus began with the appreciation of its movements inside the mother's womb, which is around the fourth month of pregnancy, thus equating life with quickening (the development of a spinal cord). Based on the tradition that speaks about creation developmentally in three stages of forty days certain scholars interpret the tradition to mean that life begins in a fetus with the breathing in of the spirit, which occurs towards the end of first trimester. That is the reason why some *Sunni* jurists allow justifiable abortion within that period, while all schools agree that the sanctity of fetal life must be linked after the fourth month.

The question in Islamic law is: when does the union of a sperm and an ovum entail sanctity and rights? When does fetal sanctity begin? To formulate their response to this question the jurists have

turned their attention to the Koranic embryology. The Koran describes the life of a fetus inside the womb in a detailed and precise manner:

We created (*khalaqna*) man of an extraction of clay, then we set him, a drop in a safe lodging, then We created of the drop a clot, then We create of the clot a tissue, then We created of tissue bones, then we covered the bones in flesh; thereafter We produced it as another creature. So blessed be God, the Best of creators (*khaliqin*)! (K. 24:12-14).

Muslim commentators have drawn some important conclusions from this and other passages that describe the development of embryo to a full human person. First, human creation is part of the divine will that determines the embryonic journey to a human creature. Second, it suggests that perceivable life is possible at the later stage in biological development of the embryo when God says: "thereafter We produced him as another creature." Third, it raises questions whether fetus should be accorded a status of a legal person once it lodges in the uterus in the earlier stage. Fourth, it allows for a possible distinction between a biological and moral person because of the silence of the Koran over when the ensoulment occurs in this process. Majority of the *Sunni* and some *Shi'i* scholars, make a distinction between two stages in pregnancy divided by the end of the fourth month (120 days) when, according to some traditions ascribed to the Prophet, ensoulment takes place. A fetus that has acquired human features and traits is one with sanctity and rights, but not every living organism in a uterus is entitled to the same degree of sanctity and honor. On the other hand, majority of the *Shi'i* and some *Sunni* legists have exercised caution in making such a distinction because they regard the embryo in the pre-ensoulment stages as alive and its eradication a sin.

The classical formulations based on the Koran and the Tradition provide no universally accepted definition of the term 'embryo' with which we are concerned in our ethical deliberations. Nor do these two foundational sources of the Islamic law, lend themselves to recognize the modern biological data about the beginning of life from the moment of impregnation. A tenable conclusion, derived by rationally inclined interpreters of the above-cited verse of the Koran, suggests that as participants in

the act of creating with God, human beings can actively engage in furthering the overall well estate of humanity by intervening in the works of nature, including the early stages of embryonic development, to improve human health.

In the Tradition essential boundaries of fetal development were the source of differences of opinion in dealing with establishing the moral status of fetus. The time before and the period after the appearance of form (ensoulment) provided a line of division in the embryonic development to personhood. According to the question raised by Ibn Qayyim al-Jawziyya, a leading medieval authority in Islamic traditions, ensoulment takes place at a later stage with voluntary movement in a fetus:

Does an embryo move voluntarily or have sensation before the ensoulment? It is said that it grows and feeds like a plant. It does not have voluntary movement or alimentation. When ensoulment takes place voluntary movement and alimentation is added to it (5).

Another traditionist, Ibn Hajar al-`Asqalani, maintains:

The first organ that develops in a fetus is the stomach because it needs to feed itself by means of it. Alimentation has precedence over all other functions for in the order of nature growth depends on nutrition. It does not need sensory perception or voluntary movement at this stage because it is like a plant. However, it is given sensation and volition when the soul (*nafs*) attaches itself to it (6).

The Prophet was asked about the timing of ensoulment in an embryo. In response he described stages of embryonic development until he reached the description at the end of the fourth month when bodily organs begin to become distinct. It is also at this stage, as the tradition reports, when the fetus takes a proper human form. The fetus now hears and moves voluntarily, expresses pain and happiness on its face. All this suggests that the ensoulment takes place at the end of the fourth month, which is both supported by the tradition that speaks about the three forty day stages of embryonic development and the verse of the Koran (24:12-14).

The grand Mufti of Jordan, Shaykh `Abd Allah al-Qalqili, regards it permissible to take medicine

for abortion as long as the embryo is still unformed in the human shape. The period of this unformed state is given by him as 120 days. Muslim jurists concur that during this period embryo or the fetus is not yet close to independent viability. A tradition reports that the second caliph, `Umar b. al-Khattab (d. 644), did not regard abortion an infanticide unless the fetus is already past the limit.

According to Ibn Hazm, another medieval legal scholar, the penalty for killing a fetus after ensoulment, if it is possible to determine the age of fetus with certainty, is equal to killing it after it is born. Hence, there is proper retribution in this crime and not simply compensation.

The Theological Dimension of the Issue

The theological dimension in the matter of human creation presented in the teachings of the Koran leaves room for human intervention in the workings of nature associated with reproduction. Nevertheless, the Koran takes into account the problem of human arrogance which takes the form of rejection of God's frequent reminders to humanity that God's immutable laws are dominant in the nature and human beings cannot willfully interfere in the laws of nature "unless God, the Lord of all Being, wills." (81:29) "The will of God" in the Koran has often been interpreted as the "processes of nature uninterfered with by human action." Hence, in Islam human manipulation of genes made possible by biotechnical intervention in the early stages of life in order to improve the health of the fetus or cloning in the meaning of embryo splitting for the purpose of improving the chances of fertility for a married couple is regarded as an act of faith in the ultimate will of God as the Giver of all life.

The Ethical Dimension of the Issue

The ethical issues associated with gene therapy for life-threatening conditions raise the question about the ways in which research that involves the possible abuse of a blastocyst that might be created by the use of nuclear transplant (cloning) and then the subsequent use of stem cell techniques. The research may lead to the acceleration of research in reproductive genetics with direct impact on inter-human relationships that occur from a naturally occurring pregnancy, uninterrupted by science

through its natural course of development within a marriage. Islam regards interpersonal relationships as fundamental to human religious life. In fact, the Prophet is reported to have said that nine-tenth of religion constitutes inter-human relationship, whereas only one-tenth is God-human.

Since the George Washington University Medical Center success in duplicating genetically defective human embryos by blastomere separation in 1993, Muslims have raised questions about manipulation of human embryos beyond IVF implantation in terms of their impact upon the fundamental relationship between man and woman and the life-giving aspects of spousal relations that culminate in parental love and concern for their offspring. The Koran declares sex-pairing to be a universal law in all things (K. 51:49). Muslim focus of the debate on genetic replication is concerned with moral issues related to the possibility suggested by the research that embryonic stem cells that have been derived from blastocysts and removed from their ordinary reproductive context may be capable of producing lines of virtually any kind of cell, whether for basic research, cell or tissue transplantation, pharmaceutical development, or some other as yet undefined purpose.

Can human advancement in biotechnically created relationships jeopardize the very foundation of human community, namely, a religiously and morally regulated spousal and parent-child relationship under the laws of God? Hence, the more intricate issues associated with embryo preservation and experimentation have received less emphasis in these ethical deliberations. To be sure, since the therapeutic uses of cloning in IVF appears as an aid to fertility strictly within the bounds of marriage, both monogamous and polygamous, Muslims have little problem in endorsing the technology. The opinions from the Sunni and Shi'i scholars studied for this presentation indicate that there would be almost a unanimity in Islamic rulings on therapeutic uses of cloning technology, as long as the lineage of the child remains religiously unblemished.

Besides the relationship issue, in the world dominated by the multi-national corporations Muslims, like other peoples around the globe, do not treat technology as amoral. No human action is

possible without intention and will. In light of the manipulation of genetic engineering for eugenics in the recent history, it is reasonable for the Muslims, like the Christians and the Jews, to fear the way the products generated by stem cell research can be treated with a marketplace approach guiding their commodification and commercialization.

It is obvious that ethically embryonic stem cell research for purposes other than therapeutic lays enormously grave responsibility on humans in terms of genetic improvement of quality of human life, the authority that can make these decisions with necessary foresight and wisdom, and the criteria that can be used in evaluating the risks and benefits of such interventions.

The Legal Dimension of the Issue

In Islam although religious, ethical and legal dimensions are interrelated, it is important to understand the legal aspects of new technologies that change the way we treat the moral status of a thing outside human body. Muslim legists are expected to evoke the two fundamental principles of 'equity' (*is-tihsan*) and 'public interest' (*maslaha*) to furnish a religious basis for independent legal decisions about innovative scientific research constrained by the fact that there are no precedents available to deal with such technological advancements in the Islamic jurisprudence. These two principles function as supplementary procedures to derive rules that can be applied to formulate new decisions and override the strict letter of law. In addition, three major subsidiary principles or rules applied to resolve ethical dilemma and derive judgments related to bioethical issues are: (1) 'protection against distress and constriction' (*'usr wa haraj*); (2) 'refraining from causing harm and loss to oneself and others' (*la darar wa la dirar*), and (3) 'averting causes of corruption has precedence over bringing about benefit' (*dar'u al-mafasid muqaddam 'ala jalb al-masalih*).

Based on theological and ethical considerations derived from the Koranic passages that describe embryonic journey to personhood developmentally, and the rulings that treat ensoulment and personhood almost synonymously occurring over time, it is correct to suggest that majority of the *Sunni* and *Shi'i* jurists will have little problem in endorsing ethically regulated research on the stem

cells that promises potential therapeutic value.

Owing to the new nature of research on stem cells, gametes, embryos, and tissues from humans and animals, without conception, the ethical-religious assessment of research uses of pluripotent stem cells derived from human embryos in Islam can be inferentially deduced from the rulings of the *Shari'a*, Islamic law, that deal with the fetal viability and embryo sanctity in the classical and modern juristic decisions. Islamic Law treats a second source of cells derived from fetal tissue following abortion analogically similar to cadaver donation for organ transplantation to save other lives, and hence, permissible.

Let me reiterate here as that since the major breakthrough in scientific research on embryonic stem cells in November 1998, I have not come across any recent rulings in Islamic bioethics regarding the moral status of the blastocyst from which the stem cells are isolated. The moral consideration and concern in Islam have been connected, however, with fetus and its development to a particular point when it attains human personhood with full moral and legal status. Based on theological and ethical considerations derived from the Koranic passages that describe embryonic journey to personhood developmentally, and the rulings that treat ensoulment and personhood almost synonymously occurring over time, it is correct to suggest that majority of the *Sunni* and *Shi'i* jurists will have little problem in endorsing ethically regulated research on the stem cells that promises potential therapeutic value provided therapeutic benefits are not simply speculative.

Muslim legal rulings reflect a cautious attitude to the project beyond treatment of infertility or assessment of genetic or other abnormalities in the embryo prior to implantation. Whereas recent breakthrough in primordial stem cells provides unique opportunity to the scientists to fathom the secrets of God's creation, it also carries with it grave responsibility and unprecedented risks. Nevertheless, these breakthroughs with implications for the diagnosis and treatment of human illness are regarded as part of the divine willing to afford human kind yet another opportunity for moral training and maturity. The Koran seems to be suggesting that important scientific discoveries to ad-

vance human well-being and social justice is just that opportunity for our over all maturity as members of the global community under God.

REFERENCES

1. Majors compilations of Muslim traditions mention this narrative, with slight variations, and usually includes the sex of the child as the fourth decree instead of its work. See, for example, al-Bukhari, Sahih, *Kitab al-qadar* (the book of destiny) and Muslim, Sahih, also in the same section dealing with human destiny.
2. There are numerous traditions that speak about surrendering to the will of God in matters that cause afflictions, whether through natural or human made causes. See: al-Bukhari, Sahih, sections on destiny.
3. Carol Lee, "Creating a Genetic Underclass: The Potential for Genetic Discrimination by the Health Insurance Industry," *Pace Law Review* 13, no. 1 (1993): 196. The author correctly points out that correlation between some disease susceptibilities, such as cancer or heart disease, are not simply the result of altered gene. In reality, the actual development and progression of a disease is a result of a combination of factors, such as environment and the presence of other genes. The difference between genetic susceptibility to disease and the actual development of disease is great and must be emphasized.
4. Ibn Qudama, *al-Mughni* (Cairo: Hajar, 1992), Vol. 8, p. 170.
5. Ibn al-Qayyim, *al-Tibyan fi aqşam al-qur'an*, p. 255.
6. Ibn Hajar, *Fath al-bari fi sharh al-bukhari, kitab al-qadar*, 11:482.