



Research Article

Genetics and Microchimerism in the Contemporary Society: An Exegetical Discourse

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Abstract. The evolving nature of scientific issues in the contemporary society makes the world a complex terrain not only socially but also religiously. Among these issues are genetics and microchimerism which are related to individuals and the society. However, both concepts have become part and parcel of human life in the contemporary society as a result of technological advancement and civilization. It is important to note that the Muslims are being affected one way or

the other through marital affairs. Thus, this paper delves into the concept of genetics and microchimerism by exploring its implications in the contemporary Muslims. The study adopts analytical method of research. Through this, it aims to analyze the concept of genetic and microchimerism, explore its implications on individuals and the society. It also provides insights into the ethical and moral dimensions of this phenomenon from the Quranic perspectives through the explanations of *Mufasssirūn* in their exegetical works. The findings of this research highlight the need for a nuanced understanding of genetic and microchimerism, emphasizing the importance of addressing the ethical, social, and identity-related concerns associated with this phenomenon. This paper suggests further research on the intersection of genetics; Microchimerism and Islamic Jurisprudence. It also recommends the creation of awareness programme to enlighten the public on the ethical and societal implications of genetics and Microchimerism as well highlighting the limitation of DNA testing in determining child paternity.

Keywords: Genetics, Microchimerism, Bioethics, Quranic perspectives

INTRODUCTION

The rapid advancements in the field of genetics and biotechnology have brought forth a multitude of ethical, social, and religious considerations. Among these is the phenomenon of microchimerism, which refers to the presence of genetically distinct cells within an individual's body, derived from another individual. (Shrivastava et al., 2019) This biological phenomenon has significant implications on the understanding of human identity, individuality, and the boundaries between self and non-self. (Nelson, 2012) In contemporary society, microchimerism has gained increasing attention due to its potential impact on various aspects of human life, including pregnancy, organ transplantation, and autoimmune disorders. (Guth & Nelson, 2021).

The Rampant Nature of DNA tests in contemporary society calls for not only attention but also religious intervention, many homes have been shattered because of the differences in the DNA of a child and that of his parent leading to different calamities in the life of humans such as suicide which happens in the case of Mr. Tunde Thomas a former staff of the defunct Oceanic Bank, whose wife Moyo Thomas was reportedly engaging in an office romance with her boss, her bank MD. His death arose from unpleasant news that two kids from his marriage were discovered to have been fathered by the then Managing Director of First City Monument Bank (FCMB), Adam Nuru, who was his wife's boss. After Tunde received the sad news first in 2017, He reportedly suffered a stroke. He later recovered from the stroke but was not in good shape again healthwise. He was said to have cried a lot. However, on the night of 15th December 2020, Tunde was said to have got home from work and collapsed at his residence's staircase. He died instantly. The autopsy report puts the cause of his death as 'heart failure'. (Nigerian news leaders, 2020)

Also, there are cases of child misplacement from the hospital where child delivery is taking place which will also lead to different DNA between the baby and the parents. Similarly, contemporary society is facing a series of premarital and extramarital affairs that are capable of making the DNA Of the unborn child different

from that of the real parent. The most disheartening of this is that the Muslims are victims of this phenomenon.

As scientific knowledge continues to evolve, it becomes imperative to explore the religious and ethical dimensions of these discoveries, particularly within the context of the Islamic faith and the teachings of the Qur'an. The Qur'an, as the central religious text of Islam, offers a comprehensive worldview and guidance on various aspects of human existence. While the Quran does not explicitly address the concept of microchimerism, it provides principles and frameworks that can be applied to understand and navigate the ethical and social implications of this phenomenon. (Nasr, 1976).

This paper aims to engage in an exegetical discourse, exploring the potential insights and guidance that the Quran may offer regarding genetics and microchimerism in contemporary society. (Muhsin, 1992) It will delve into relevant Quranic verses and their interpretations, drawing upon the rich tradition of Islamic scholarship and exegesis. By examining the Quranic perspectives on topics such as human creation, individuality, and the interconnectedness of all beings, this paper seeks to contribute to the ongoing dialogue between faith and science. (Golshani, 2003) It will explore how the Quranic teachings can inform our understanding and approach to the ethical and social challenges posed by the advancements in genetics and microchimerism while respecting the sanctity of human life and the divine wisdom inherent in the natural order. (Swazo, 2009).

Through this exegetical discourse, the paper will shed light on the Islamic perspective on genetics and microchimerism, fostering a deeper appreciation for the harmony between faith and scientific inquiry. The Qur'an itself is in full support of specific discoveries as it surface in page where muslims are encouraged to traverse on the expanse of earth in search of knowledge for instance Q29:20 provides this:

قُلْ سِيرُوا فِي الْأَرْضِ فَانظُرُوا كَيْفَ بَدَأَ الْخَلْقَ ثُمَّ اللَّهُ يُنشِئُ النَّشْأَةَ الْآخِرَةَ إِنَّ اللَّهَ عَلَىٰ كُلِّ شَيْءٍ قَدِيرٌ ۝ ٢٠

Say: Travel in the earth and see how He makes the first creation, then Allah creates the latter creation; surely Allah has power over all things.

Genetics and Microchimerism: A Conceptual Analysis

At this juncture, it will be relevant to briefly explain some concepts which are important to this discussion for the purpose of proper understanding of them in the way they are being used in this context as well as knowing their interconnectivity. The concepts are Genetics and Microchimerism.

Genetics: This is the study of genes and the principles and mechanisms of heredity, or how traits are passed from parents to offspring. (Griffiths et al., 2015) It also encompasses the understanding of how traits are passed down from one generation to the next, the mechanisms of gene expression, and the role of genetic factors in health and disease. If one were to put the above "descriptive definition" of Genetics in a capsule form, Bateson, who coined the term Genetics in 1906 aptly defines it as follows: Genetics is the science dealing with heredity and

variation, seeking to discover laws governing similarities and differences in individuals related to descent. The factors which are transmitted were called “Genes” by Johannsen in 1909.(Lipshitz , 2021).

The term chimerism was first used by Liegeois in the 1970s. Chimera is a single organism that is made up of two or more different populations of genetically distinct cells that originated from different zygotes involved in sexual reproduction. If the different cells have arisen from the same zygote, the organism is called a mosaic. Chimeras are formed from at least four parent cells (two fertilized eggs or early embryos fused together). Each population of cells retains its own character and the resulting organism has a mixture of tissues.(Mosby, 1996)

Microchimerism: It has been defined by many authors in different ways for instance; Galofre defined microchimerism as the presence of alien cells within an individual tissue with a genetically different background.(Williams, 2001) According to Waszak, it is defined “*as the coexistence of cells of different genetic origins within one individual*”. Microchimerism may also be defined as the presence of two genetically distinct and separately derived populations of cells, one population being at a low concentration, in the same individual or an organ such as the bone marrow according to Dawe GS (cell migration from the baby to mother). Hence, microchimerism refers to the harboring of small numbers of cells (or DNA) that originated in a genetically different individual.(Waszak, 2013)

Microchimerism is a topic of current interest due to several reasons as it plays an important role in autoimmune diseases, cancer and wound healing, etc. During pregnancy, some cells transfer from the mother to the fetus and vice versa. Interestingly, a small number of cells from mother persist in her offspring and persists till adult life, whereas a small number of cells from previous pregnancies persist in mother for many years. We are just beginning to understand the implications of these “cells” which may be beneficial or detrimental for the health of the host. Microchimeric cells have two possible lineages which are Natural and Artificial.(Boyon et al., 2011) Natural microchimerism is broadly divided into three parts:

i. Fetal Microchimerism

This is the most common form of natural microchimerism in which there is the transfer of intact living fetal cells from the fetal circulation into the maternal circulation and occurs in all pregnancies and increases as the gestational age advances.(Giacomelli et al., 2002) This transfer of fetal hematopoietic pluripotent progenitor cells starts in the 4th or 5th week after fertilization and continues throughout the pregnancy. The presence of these fetal microchimeric cells can be detected for up to 30 days in the maternal postpartum bloodstream.

ii. Microchimerism in Twins

Microchimerism may also occur other than the transfer of cells between the mother and the fetus. An exchange of cells can also take place between bigeminal fetuses in the uterus. Microchimerism may also originate from a “spectral twin.”(Waszak et al., 2013)

iii. Microchimerism in sexual intercourse

Several studies have detected the presence of male cells in female bodies and vice versa, even in individuals who have not been pregnant or undergone transplants. These findings suggest that cell transfer can occur through other routes, which is sexual intercourse.¹⁷ During sexual intercourse, cells from the partner's semen, vaginal secretions, or micro-abrasions in the genital tract can potentially enter the bloodstream and establish microchimeric populations in various tissues and organs. (Chan et al., 2012)

If microchimeric cells are present in the germ line and contribute genetic material during fertilization, it could potentially lead to genetic mosaicism in the offspring, where cells within the same individual have different genetic compositions. (Jiang et al., 2019) If microchimeric cells from a sexual partner contribute genetic material to the offspring, it could potentially influence the child's DNA and inherited traits, albeit to a potentially small degree. (O'Donoghue, 2008).

Exegetical Discourse on Genetics

The Quran offers profound insights into the nature of creation and the intricacies of human existence. While the Quran is not a scientific treatise, it contains numerous verses that allude to the principles of genetics and heredity, inviting scholarly interpretation and exploration. *Tafsīr Qurtubī's* commentary on Qur'an 4:1 and 4:88-91 made Emphasis on the concept of "*khalq*" (creation) and "*nasab*" (lineage). (Qurtubī, 1967). Also Discussion of the creation of human beings from a single soul (Qur'an 4:1) and the importance of lineage and genealogy is being discussed by him in (Qur'an 4:88-91). Al-Qurtubī explains that the term "*khalq*" has three primary connotations:

1. **Creation (*khalq al-ibdā'*)**: This refers to the initial creation of human beings from a single soul (*nafs wa'idah*), as mentioned in Qur'an 4:1. This concept signifies the origin of humanity and the creation of the first human beings. (Qurtubī, 1967).
2. **Lineage (*khalq al-nasl*)**: This connotation refers to the subsequent generations and descendants of the initial creation. It encompasses the idea of family, tribe, and nation, highlighting the connection between individuals and their ancestors. (Qurtubī, 1967).
3. **Genealogy (*khalq al-ansāb*)**: This term specifically refers to the tracing of one's ancestry and family lineage. It involves understanding one's heritage, pedigree, and the relationships between individuals and their forebears. (Qurtubī, 1967).

Al-Qurtubī asserts that understanding the concept of "*khalq*" is crucial in grasping the significance of human lineage and genealogy. He argues that the Qur'an emphasizes the importance of knowing one's lineage and genealogy, as it serves several purposes, thus:

- i. Recognizing the honor and preference given to certain individuals and families
- ii. Understanding one's place within the larger human family
- iii. Appreciating the connections and relationships between individuals and their ancestors
- iv. Tracing the lineage of prophets, scholars, and other important figures in Islamic history. (Qurtubī, 1967). Allah says in Qur'an 3:59

إِنَّ مَثَلَ عِيسَىٰ عِنْدَ اللَّهِ كَمَثَلِ آدَمَ خَلَقَهُ مِنْ تُرَابٍ ۖ ثُمَّ قَالَ لَهُ كُنْ فَيَكُونُ ٥٩

Surely the likeness of Isa is with Allah as the likeness of Adam; He created him from dust, then said to him, Be, and he was.

As-Suyuti's Commentary on the above verse is that the creation of Adam and Jesus, as described in the Qur'an, is a manifestation of Allah's power and wisdom. (Al-Suyuti, 1967) He also notes that the phrase "*He created him from dust*" indicates the origin of human creation from a single cell, emphasizing the concept of genetic continuity. (Al-Suyuti, 1967) Also in Qur'an 35:18, Allah says:

وَلَا تَزِرُ وَازِرَةٌ وِزْرَ أُخْرَىٰ ۗ وَإِن تَدْعُ مُثْقَلَةٌ إِلَىٰ جَمَلِهَا لَا يُحْمَلُ مِنْهُ شَيْءٌ ۚ وَلَوْ كَانَ ذَا قُرْبَىٰ ۗ إِنَّمَا تُنذِرُ الَّذِينَ يَخْشَوْنَ رَبَّهُم بِالْغَيْبِ وَأَقَامُوا الصَّلَاةَ ۗ وَمَن تَزَكَّىٰ فَإِنَّمَا يَتَزَكَّىٰ لِنَفْسِهِ ۗ وَإِلَى اللَّهِ الْمَصِيرُ

١٨

And a burdened soul cannot bear the burden of another and if one weighed down by burden should cry for (another to carry) its burden, not aught of it shall be carried, even though he be near of kin. You warn only those who fear their Lord in secret and keep up prayer; and whoever purifies himself, he purifies himself only for (the good of) his own soul; and to Allah is the eventual coming.

As-Suyuti interprets this verse as highlighting the individual's responsibility for their actions, emphasizing that each person's genetic makeup and environmental factors shape their unique characteristics. (Al-Suyuti, 1967) He notes that the phrase "*no bearer of burdens will bear the burden of another*" indicates the concept of genetic inheritance, where individuals inherit traits from their parents. Abdul A'la Maududi's commentary on Quran 4 verse 1 state thus:

The declaration 'Who created you from a single being (nafs)' implies that the creation of the human species began with the creation of one individual. In another place, the Qur'an specifies that the one person from whom the human race spread in the world was Adam. The details of how its mate was created are not known to us. The explanation which is generally given by the commentators of the Qur'an and which is also found in the Bible is that Eve was created out of a rib of Adam. (The Talmud is even more detailed in that, it states that Eve was created out of Adam's thirteenth rib on the left side.) The Qur'an, however, is silent on the matter and the tradition which is adduced in support of this statement does not mean what it is often thought to be. It is thus better that we leave the matter in the same state of ambiguity in which it was left by God, rather than waste our time trying to determine, in detail, the actual process of the creation of man's mate. (Maududi, 2006).

Exegetical Discourse on Microchimerism

Recent studies have also detected the presence of male DNA in women's bloodstreams, even if they have never been pregnant. (Bianchi et al., 2021) This phenomenon is attributed to microchimerism through sexual intercourse, where

male cells are transferred to the female body during sexual activity.(Ellis, et al., 2017).In Islamic theology, the concept of microchimerism raises questions about the nature of human creation and the relationship between individuals. The Qur'an describes human creation as a gradual process, from clay to a fully formed being (Qur'an 23:12-14)

وَلَقَدْ خَلَقْنَا الْإِنْسَانَ مِنْ سُلْطَةٍ مِنْ طِينٍ ۚ ۱۲ ثُمَّ جَعَلْنَاهُ نُطْفَةً ۚ فِي قَرَارٍ مَّكِينٍ ۚ ۱۳ ثُمَّ خَلَقْنَا الْأَلْفُفَةَ ۚ فَخَلَقْنَا الْعَلَقَةَ مُضْغَةً ۚ فَخَلَقْنَا الْمُضْغَةَ عِظْمًا ۚ فَكَسَوْنَا الْعِظْمَ لَحْمًا ۚ ۱۴ ثُمَّ أَنشَأْنَاهُ خَلْقًا آخَرَ ۚ فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ ۚ ۱۴

And certainly We created man of an extract of clay, Then We made him a small seed in a firm resting-place, Then We made the seed a clot, then We made the clot a lump of flesh, then We made (in) the lump of flesh bones, then We clothed the bones with flesh, then We caused it to grow into another creation, so blessed be Allah, the best of the creators.

Microchimerism can be seen as an extension of this process, where cells from one individual become part of another.

The persistence of male cells in a woman's body after sexual intercourse can be viewed as a manifestation of the connection between individuals, highlighting the interconnectedness of human beings.(Gonzalez-Garcia, et al. 2017). This connection is emphasized in Islamic teachings, which encourage the believers to maintain chastity and modesty as Allah says in the Qur'an 24:30-31.

قُلْ لِلْمُؤْمِنِينَ يَغُضُّوا مِنْ أَبْصَارِهِمْ وَيَحْفَظُوا فُرُوجَهُمْ ذَلِكَ أَزْكَى لَهُمْ إِنَّ اللَّهَ خَبِيرٌ بِمَا يَصْنَعُونَ ۚ ۳۰ وَقُلْ لِلْمُؤْمِنَاتِ يَغْضُضْنَ مِنْ أَبْصَارِهِنَّ وَيَحْفَظْنَ فُرُوجَهُنَّ وَلَا يُبْدِينَ زِينَتَهُنَّ إِلَّا مَا ظَهَرَ مِنْهَا ۚ وَلَا يَضْرِبْنَ بِخُمُرِهِنَّ عَلَى جُيُوبِهِنَّ وَلَا يُبْدِينَ زِينَتَهُنَّ إِلَّا لِبُعُولَتِهِنَّ أَوْ آبَائِهِنَّ أَوْ آبَاءِ بُعُولَتِهِنَّ أَوْ أَبْنَائِهِنَّ أَوْ أَبْنَاءِ بُعُولَتِهِنَّ أَوْ إِخْوَانِهِنَّ أَوْ بَنَاتِ إِخْوَانِهِنَّ أَوْ نِسَائِهِنَّ أَوْ مَا مَلَكَتْ أَيْمَانُهُنَّ أَوْ التَّبَعِينَ غَيْرِ أُولِي الْأَرْبَةِ مِنَ الرِّجَالِ أَوْ الْوَالِدِ الَّذِي لَمْ يَظْهَرُوا عَلَى عَوْرَتِ النِّسَاءِ وَلَا يَضْرِبْنَ بِأَرْجُلِهِنَّ لِيُعْلَمَ مَا يُخْفِينَ مِنْ زِينَتِهِنَّ وَتَوْبُوا إِلَى اللَّهِ جَمِيعًا أَيُّهُ الْمُؤْمِنُونَ لَعَلَّكُمْ تُفْلِحُونَ ۚ ۳۱

Say to the believing men that they cast down their looks and guard their private parts; that is purer for them; surely Allah is Aware of what they do. And say to the believing women that they cast down their looks and guard their private parts and do not display their ornaments except what appears thereof, and let them wear their head-coverings over their bosoms, and not display their ornaments except to their husbands or their fathers, or the fathers of their husbands, or their sons, or the sons of their husbands, or their brothers, or their brothers' sons, or their sisters' sons, or their women, or those whom their right hands possess, or the male servants not

having need (of women), or the children who have not attained knowledge of what is hidden of women; and let them not strike their feet so that what they hide of their ornaments may be known; and turn to Allah all of you, O believers! so that you may be successful.

In Qur'an 4:1 Allah says:

يَا أَيُّهَا النَّاسُ اتَّقُوا رَبَّكُمُ الَّذِي خَلَقَكُمْ مِنْ نَفْسٍ وَاحِدَةٍ وَخَلَقَ مِنْهَا زَوْجَهَا وَبَثَّ مِنْهُمَا رِجَالًا كَثِيرًا وَنِسَاءً ۚ وَاتَّقُوا اللَّهَ الَّذِي تَسَاءَلُونَ بِهِ وَالْأَرْحَامَ إِنَّ اللَّهَ كَانَ عَلَيْكُمْ رَقِيبًا ۝١

O people! be careful of (your duty to) your Lord, Who created you from a single being and created its mate of the same (kind) and spread from these two, many men and women; and be careful of (your duty to) Allah, by Whom you demand one of another (your rights), and (to) the ties of relationship; surely Allah ever watches over you.

This verse highlights the creation of humanity from a single soul, emphasizing the unity and solidarity of human existence. Microchimerism through sex can be seen as a manifestation of this unity, where cells from an individual become part of another, symbolizing the connection between human beings. Allah says in Qur'an 35:18:

وَلَا تَزِرُ وَازِرَةٌ وِزْرَ أُخْرَىٰ ۚ وَإِن تَدْعُ مُثْقَلَةٌ إِلَىٰ جَمِلِهَا لَا يُمْسِلُ مِنْهُ شَيْءٌ ۚ وَلَوْ كَانَ ذَا قُرْبَىٰ ۗ إِنَّمَا تُنذِرُ الَّذِينَ يَخْشَوْنَ رَبَّهُم بِالْغَيْبِ وَأَقَامُوا الصَّلَاةَ ۚ وَمَنْ تَزَكَّىٰ فَإِنَّمَا يَتَزَكَّىٰ لِنَفْسِهِ ۗ وَإِلَى اللَّهِ الْمَصِيرُ ۝١٨

And a burdened soul cannot bear the burden of another and if one weighed down by burden should cry for (another to carry) its burden, not aught of it shall be carried, even though he be near of kin. You warn only those who fear their Lord in secret and keep up prayer; and whoever purifies himself, he purifies himself only for (the good of) his own soul; and to Allah is the eventual coming.

As-Suyuti's comment on this verse emphasizes the individual's responsibility for their actions, highlighting that each person's genetic makeup and environmental factors shape their unique characteristics. Microchimerism through sex can be seen as a reminder of the interconnectedness of human beings, where cells from one individual become part of another, sharing the burden of life. (Abdel Haleem, 2005)

Relevance of Exegetical Discourse on Genetics and Microchimerism to society

The burgeoning field of genetics, particularly the phenomenon of microchimerism, presents a compelling case for the continued relevance of exegetical discourse within the Islamic law. Scientific research on microchimerism has also shed light on the transfer of cells from one individual to another, which has significant implications for the understanding of human biology and relationships. (Abdel

Haleem, 2005) The Quran, as the sacred text of Islam, contains verses that have been interpreted to address various aspects of human life, including the creation of humans and the transfer of cells. In the context of genetics and microchimerism, the Quran provides a unique perspective on the transfer of cells through sex and its implications on DNA.

Firstly, the Quran emphasizes the creation of humans from a single soul, highlighting the unity and equality of all human beings (Quran 4:1). This concept is echoed in the scientific understanding of microchimerism, where cells from one individual can be present in another individual's body. The Quran also describes the creation of humans from a drop of fluid (Quran 32:9), (Ibn Rushd, 2004), which can be seen as a reference to the transfer of cells through sexual reproduction. Additionally, the Quranic verse "And indeed, we created man from an extract of clay" (Quran 23:12) can be interpreted in the light of scientific discoveries on the origin of human life.

According to Ibn Kathir, this verse refers to the creation of humans from a drop of fluid. (Ibn Kathir, 2001). This interpretation is supported by scientific research on the origin of human life, which suggests that humans evolved from a single-celled organism. (Dawkins, 1976) The Prophet (ﷺ), also provide valuable insights into the understanding of genetics and microchimerism. For example, the *hadith* "The child belongs to the bed, and for the adulterer is the stone" (Bukhari, 2001). has been interpreted to mean that the child born out of a sexual relationship is attributed to the husband, unless there is clear evidence to the contrary. This *hadith* has implications for the concept of *lian*, or the establishment of paternity, in Islamic law. (Kamali, 2005).

Scientific research has shown that cells from a sexual partner can be present in an individual's body for extended periods, potentially influencing DNA. (Gonzalez-Garcia et al., 2017) This phenomenon raises questions about the concept of *lian*, or the establishment of paternity, in Islamic law. Regarding *lian*, the Quran provides guidance on establishing paternity and the implications of sexual relationships on DNA. In Quran 58:2, it is stated that those who accuse their spouses of adultery and cannot produce four witnesses shall be punished. This verse has been interpreted to mean that the child born out of a sexual relationship is attributed to the husband unless there is clear evidence to the contrary. (Al-Suyuti, 1967)

However, the transfer of cells through sexual intercourse with another man before marriage has significant implications for the DNA of the child born out of such a relationship. Scientific research has shown that cells from a previous sexual partner can be present in an individual's body for extended periods, potentially influencing the DNA of the child. (Gonzalez-Garcia et al., 2017) This raises questions about the use of DNA to affirm the certainty of a child in the *Shariah*. While DNA testing can provide conclusive evidence of paternity, it is not fullproof, and the presence of cells from a previous sexual partner can potentially challenge the accuracy of DNA testing.

CONCLUSION

In conclusion, this paper has delved into the intricate relationship between genetics, microchimerism, and Islamic jurisprudence in the contemporary society.

Through a rigorous exegetical discourse, the work has explored the conceptual analysis, theological interpretations, and societal implications of genetic and microchimeric concepts. The discussion has revealed the complexities and nuances of genetics and microchimerism, highlighting the need for a multifaceted approach that incorporates scientific, ethical, and theological perspectives. The historical development and current understanding of genetics and Microchimerism have also been examined through analysis of relevant Quranic verses and *Hadith*, just like the role of genetics and microchimerism in modern society, has been examined.

A critical takeaway from this paper is that DNA testing, while a powerful tool, cannot be the sole proof for denying paternity of a child. Islamic jurisprudence emphasizes the importance of considering multiple factors, including social and familial contexts, in determining paternity and inheritance. It has been discussed that cautions should be taken not to rely solely on genetic evidence because of child misplace at the hospital during birth, as well as premarital affairs which could have effect on the DNA of the child and this may lead to unjust outcomes and disregard the complexities of human relationships. The paper, has demonstrated the significance of Islamic jurisprudence in addressing the ethical and societal implications of genetics and microchimerism. The work has shown how Islamic principles and values can provide a framework for navigating the complex issues surrounding genetic engineering, microchimerism, and DNA testing.

Ultimately, this research has emphasized the importance of a collaborative and interdisciplinary approach to understanding the intersection of genetics, microchimerism, and Islamic jurisprudence. By engaging in a rich and thought-provoking exploration of these issues, we can foster a deeper understanding of the complex relationships between science, religion, and society, and work towards a more nuanced and informed discourse.

Recommendations

1. Further research on the intersection of genetics, microchimerism, and Islamic jurisprudence needs to be explored.
2. Interdisciplinary collaboration between scientists, theologians, and ethicists to address the complex issues surrounding genetics and microchimerism.
3. Development of Islamic guidelines and frameworks for genetic engineering, microchimerism, and DNA testing to provide a clear and comprehensive approach.
4. Education and awareness programs to inform the public about the ethical and societal implications of genetics and microchimerism, highlighting the limitations of DNA testing in determining paternity.

By embracing this multifaceted approach, the Muslims navigate the complexities of genetics and microchimerism in contemporary society, and work towards a more informed, nuanced, and compassionate understanding of the human experience.

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