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Malay Genome Project(MGP): A Need from Islamic Perspectives

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ABSTRACT

The rapid technological advances have led new hopes in human genome research and have yielded important and informational contents concerning the mapping and sequencing of the entire human genome. Certainly with this powerful medical progress, geneticicsts are able to understand, identify and isolate genes that are responsible for causing more than 4,000 genetic diseases. It has been established that the Malay genome study in Malaysia has been conducted by the Center of Pharmacogenomics (iPROMISE), Faculty of Pharmacy, Universiti Teknologi MARA (UiTM) Puncak Alam, Selangor, Malaysia. Henceforth, this fundamental study is an attempt of the researchers to expose the public to the concepts and achievements of the study in Malay genome. Generally, Malay genome projects have succeeded in producing genome databases specifically on the genetic structure of the Malays as well assisting in producing new cures, diagnosing diseases as well as observing its resistance to certain drugs. In addition, some efforts have been made to identify genetic variations and pattern disequilibrium with the disease. Thus, in this intensive study, the researchers intend to explore the genetic ethics with regard to Islamic viewpoints that are seen significant to increase one's faith. This will later aid in the manipulation of scientific approaches for the benefits of Muslims worldwide.

KEYWORDS: Malay Genome Project (MGP), Islamic Perspective, Health, Malaysia.

INTRODUCTION

In 1860s, Gregor Johann Mendel was a pioneer in biotechnology. He was also the founder of the modern science of genetics where he successfully derived Mendel's Laws of Inheritance. This fact coincides with the findings by[5, 6, 19, 34, 35, 37, 39]. Mendel initially conducted an experiment on pea plant which later he discovered the concept of genetic inheritance. Due to this, Mendel's Laws of Inheritance since then has been introduced and applied in genetics and biotechnology. His research which was fundamentally based on the hybridization of pea plants has supported the idea of inheritance particles. Besides that, it explains his hypothesis of the existence of physical elements in germ cells that are inheritable from one generation to another without any change. During that time, follow-up assessment with respect to the cells was not yet executed and science of cytology was still at primitive phase. Hence, Mendel was at disadvantage as he could not explain these concepts in depth. Nevertheless, Mendel's research was rediscovered by European scientists such as Hugo de Vries and Carl Correns in the 1900s. They have made the same conclusion as Mendel's and it has been recognized by most cell biologists and breeders of plants and animals. Consequently, interest in human genetics and the variations has been rapidly growing.

Without doubt, this positive development has justified Mendel's experiments of the introduction of chromosomes as carriers of genes, an in-depth understanding of the concepts of mitosis, meiosis as well as fertilization. In 1933, due to his discoveries in heredity, Thomas Hunt Morgan was the first recipient of the Nobel Prize in Physiology or Medicine. His extensive studies in genetically-related field of chromosome, embryology and regeneration have contributed significant theories [15]. Apparently, the recipients of the Nobel Prize in the early and mid-20th century until now have been monopolized by genetic scientists involving recombinant genetic, relationship between genes and proteins, DNA structure as well as genetic code. Based on the historical records in 1944, the discovery of deoxyribonucleic acid (DNA), the molecule that carries the genetic code has opened a new era of science and technology, especially in biotechnology. Later in 1953, Watson and Crick successfully proposed that the molecular shape of a double-stranded DNA was double helix. Following these findings, rapid development in the field of molecular biology or biological research at the molecular level of cells and DNA genes had started emerging in the 1960s to 1970s. In 2002 and 2006, the Nobel Prize in Physiology or Medicine was awarded to Sydney Brenner, H. Robert Horvitz, John E. Sulston,

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Andrew Fire, Craig Mello and Roger Kornberg. Meanwhile, M. R. Capecchi, O. Smithies and M.J. Evans were the recipients in 2007.

KEY ISSUES IN MODERN GENETICS

Based on [26] pertaining the Declaration of Rabat and the International Conference on Bioethics, it is noted that the genetic research related to human genome involves various issues of legal, moral, ethical and Islamic laws. Henceforth, this matter should be taken seriously so that the biotechnologically-related investigations conducted do not contradict the norms of human life. This is also important to avoid disastrous occurrences on mankind. Here are some recommendations and proposals suggested by the Islamic Academy of Science (IAS):

- Recognize that human genome sequence is very significant for research development of human biology which involves certain diseases such as cancer, Alzheimer's, diabetes and heart disease.
- Attention should be given regarding the Universal Declaration on the Genome and Human Rights of the General Conference of UNESCO in 1997 as a pioneering instrument in universal biology, medicine and genetics.
- Issues related to legal, ethical and social have emerged as a result of new discoveries in the field of molecular biology and genetic engineering.
- The risk of genetic engineering is unknown due to lack of knowledge in the field.
- Provide reasonable mechanisms to maintain and regulate genetic resources.
- Human beings and the environment should not be exposed to danger in reference to the products of genetic engineering though it is for the benefit of small or of little value.
- The need for moratorium enforcement before a genetically modified product is approved to be safe for universal use.
- Issues relating to gene ownership must be investigated and resolved in the context of law, ethics and economics.

Among the humanitarian issues that have been debated among scholars and scientists are human cloning, molecular biology and genetic engineering [31]. According to Egypt's Grand Mufti Sheikh Nasser FaridWassel in 1999, it is stated that human cloning is clearly against the teaching of Islam [49]. Human cloning means creating a genetic copy of another human being outside of the practice of sexual intercourse [5].

Human cloning seems to mock or ridicule God's creation. He emphasizes that if human cloning occurs, it is as if the doctors, counsellors, scientists and parents have questioned the creation of man and rectifying the mistakes that God has created the humans. These people are considered as individuals who are arrogant and haughty. In Malaysia, the ruling on human cloning has been issued by the Fatwa Committee in 51st National Council for Islamic Religious Affairs Malaysia on March 11, 2002. The committee has decided that human cloning for any purpose whatsoever is illegal because it is contrary to the nature of human prescribed by Allah swt[31]. According to [1], human cloning is considered a threat to humans in the view of religion and law, while in [42] stated that human cloning is absolutely banned in Islam. Not only that, this statement has been explained in depth by [4, 11] in order to avoid negative views and misconceptions about human cloning procedure. They emphasize that the act of cloning humans is completely prohibited in Islam particularly for reproduction. However, Islam is open to therapeutic cloning to treat and prevent diseases. In addition, reproductive cloning will also lead to violation of natural human nature that has been established by Allah (swt) i.e. sexual relations between man and woman [1]. This certainly involves issues of aqeedah (faith). Therefore, human cloning is a form of denial to the concept of Allah as the Creator, delirium lineage, the collapse of the family institution and corrupting humans.

HUMAN GENOME PROJECT (HGP)

In [35] states that the recombinant DNA technology is fundamental in establishing gene manipulation, product development and in other genetic analyses. Moreover, he stresses that the researchers can produce recombinant DNA molecules using cloning techniques. This technique involves the production process of the original DNA in large quantities and can be possibly utilized in various applications such as mapping, sequencing, mutating and cell transforming. The fact coincides with the results of [8, 47] in which such technique is called gene cloning. At present, extensive studies on Human Genome Project (HGP) are being conducted worldwide and these mainly involve genetic analysis. The development is significant in order to raise the quality of human life. According to [10, 51], HGP is to analyse the structure of human DNA and also to identify the position of all human genes. This approach will result in great contributions in other related fields of biology, specifically in the development of neurobiology. In [13] stated that the preliminary study of HGP done earlier has successfully increased the understanding about basic damage or genetic defects and also steps to be taken to prevent and treat the damage.

Historically, HGP began as early as in 1985 and it was spearheaded by James D. Watson. He was then appointed as the head of the National Institutes of Health (NIH) in the United States in 1988. Later in 1993, Francis Collins took over his place and changed NIH to National Human Genome Research Institute (NHGRI). This occurred due to disagreement with the issue of patenting genes. Basically, a rough draft related to genome was completed in 2000 involving collaboration of geneticists from various countries such as the United States, United Kingdom, France, Germany, Japan, China and India [10].

Nevertheless, in [5] emphasizes that in 2001, Craigh Venter and Francis Collins had declared a full draft of the human genome. As of 2003, the scientists announced that the HGP was completed i.e. 98% of the genome had been sequenced with an accuracy of 99.9%. Additionally, studies of the human genome are so closely linked to the field of bioinformatics and these two are seen as influential areas in modern biotechnology [54]. In fact, bioinformatics is the application of computer science and information technology which involves the development of databases and statistical methods to analyse and identify the relationship between biological data sets [45]. The use of this technology accelerates the research process and the transmission of information thereby improving the efficiency of such biological data storage.

After the HGP was completed 10 years ago, detailed information about mapping and sequencing of the entire human genome has been known to many researchers. Henceforth, the scientists are now capable to understand, identify and isolate genes that are responsible for causing more than 4,000 genetic diseases or commonly known as gene therapy [43]. Gene therapy involves replacing genes that do not work or mutated genes using the genetic engineering techniques in mammals, particularly humans. The main goal of gene therapy is to prevent the production of enzymes and proteins that may cause diseases. In fact, gene therapy has two types i.e. germ cell and somatic gene. This involves two approaches i.e. in vivo and ex vivo. Thus, recombinant DNA technology and genetic engineering is seen able to solve the present problems in medicine, agriculture, food, environment and so forth. Apparently, the field of genetics in modern biotechnology today has been given special emphasis by scientists around the world because it is able to solve problems related to genetic diseases and hence improving the quality of human's life.

MALAY GENOME PROJECT (MGP) IN MALAYSIA: AN ACHIEVEMENT

MGP is first pioneered by the Center for Pharmacogenomics (iPROMISE) which is part of the Faculty of Pharmacy, Universiti Teknologi MARA (UiTM) Puncak Alam Campus and led by Prof. Dr. Mohd Zaki Salleh. As a result, databases on the genetic structure of the Malays can assist in producing new cures, and also in diagnosing disease resistance to certain drugs. Several attempts have been made to identify patterns of genetic variations and linkage disequilibrium with the disease. In addition, Center of Genetics and Human Biochemistry, Faculty of Applied Sciences, UiTM Shah Alam has conducted a study of the Malay genome funded by Science Fund of RM 135,000. It is entitled Genetic Variation among Six Malay Subethnic Groups: Inferences from 8 Alu Insertion Polymorphisms. Several scientific articles have been published by iPROMISE and Center of Genetics and Human Biochemistry, Faculty of Applied Sciences, UiTM Shah Alam related to Malay genome. Among them are:

a) Systematic Pharmacogenomics Analysis of a Malay Whole Genome: Proof of Concept for Personalized Medicine [41].
b) Y Polymorphism among the Malay Sub-Ethnic Groups in Peninsular Malaysia [28].
c) ACE and TPA25 Alu insertion polymorphisms in Minang Malays subethnic groups in Peninsular Malaysia [53].

MGP FROM ISLAMIC PERSPECTIVE: A NEED

Islam never prevents its believers to explore new areas, particularly in the field of modern biotechnology. However, it must be in line with Islamic teachings and does not contradict Islamic fundamental beliefs. The Quran has explained the creation and origin of humans using different words and phrases. The initial material that human comes from is clay and finally life (ruh) is breathed into it (As-Sajdah: 7). Henceforth, with the sacred tie between husband and wife, Allah (swt) has multiplied humans from His first khalifah i.e. Adam (pbuh). This is in line with what [38] emphasizes that Islam is a comprehensive living system which covers the three basic axes i.e. human's relationship with Allah, with fellow human beings as well as with other living creatures. In [38] further highlights that in order to establish these relationships, three basic axes should be observed as they are the core of faith, worship and morality. This is supported by [22] who explain that basic principles in Islam encompass aqeedah, shariah, ibadah as well as akhlaq. Meanwhile, in [50] stresses that three fundamental elements in human's life include knowing Allah, knowing Islam and also knowing the Prophets. It is apparent that faith is very closely linked to the questions of religious beliefs, ethics and morality as described by [12,13, 45].

In general, Malay genome study is focusing more on medical aspects especially in the production of modern medicines and the latest treatment methods to cure genetic diseases among Malays. Thus, further research in this area which comply Islamic perspective is yet to be done, particularly involving the aspects of aqeedah (faith).

Hence, the study has been proposed as a scientific research doctorate (Ph.D.) in Usuluddin, Faculty of Islamic Contemporary Studies at the University of Sultan Zainal Abidin (UniSZA), Gong Badak Campus, Terengganu Malaysia in 2014. The proposed title is Malay Genome Mapping Project: Implications towards Aqeedah and The Quality Malays' Life. The study is supervised by Prof.Dr. Engku Ahmad Zaki Engku Alwi from the Faculty of Contemporary Islamic Studies, UniSZA, Dr. Wan Rohani Wan Taib from the Faculty of Medicine and Health Sciences and also Ass. Prof.Dr. Mohd. Hudzari Razali from the Faculty of Bio resources and Food Industry, UniSZA.

Next, the research has been approved in 2015 through a research grant of FRGS 2015-1 under the Ministry of Education (MOE); FRGS/1/2015/SSI03/UNISZA/02/3 entitled Islamic Aqeedah Compliance Index: A Study of Malay Genome Project in Malaysia. A study period of 24 months beginning 1 October 2015 until 30 September 2017 with the allocation of funds of RM82,400.00, is led by Prof.Dr. Engku Ahmad Zaki Engku Ali (FKI, UniSZA) and four other members namely Assoc. Prof.Dr.Mohd. Hudzari Haji Razali (FBIM), Dr. Wan Rohani Wan Taib (FSK, UniSZA), Dr. Syarilla Iryani Ahmad Saany (AQEL, UniSZA) and also Mr. Norazmi Anas (ACIS, UiTM, Tapah Campus). It is hoped that this research is able to produce modules and guidance on the Malay genome from Islamic view in improving the level of confidence towards Allah (swt). Most importantly, the negative response of society to the field of genetic engineering can be corrected and subsequently to manipulate this invention to increase the level of physical and mental health of the Malays themselves.

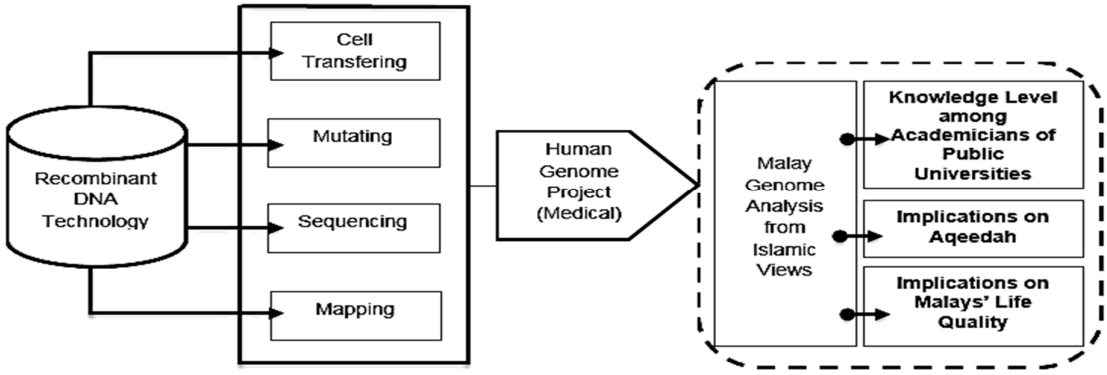

Figure 1: Conceptual framework of Malay genome project from Islamic perspectives [9, 32]

ISLAMIC AQEEDAH COMPLIANCE INDEX WITHIN THE FRAMEWORK OF MAQASID AL-SHARIAH

Semantically, maqasid is the plural of maqsud or maqsad and comes from the verbal root of qa-sa-da which refers to needs, requirements, goals as well as objectives to be achieved in doing something and it is the goal set in Islamic shariah[27]. On the other hand, shariah means anything related to and instituted in Islamic laws [14] involving legislation seeks to regulate the lives of individuals, families, communities and countries. This concerns acts of devotion ('ibadah), commercial transactions (mu'amalah), political system (siasah), marriage or family laws (munakahat) as well as the concepts of offences, crimes and punishments (jinayat) [23]. In addition, the scope of shariah law encompasses three distinct categories of relationships i.e. individual's relationship with Allah (swt) and the supernatural, relationship between fellow human beings and other creatures on earth. Generally, maqasidshariah signifies purposes, implications or purposes as required by Islam with the validation of Quran as well as Sunnah[40]. Meanwhile, in [27] have defined the term as meaning, wisdom or such and also desired law aimed at protecting the welfare of human beings. Indeed, the maqasidshariah has been further classified by the Muslim scholars into three major categories which are based on the descending order of importance i.e. dharuriyyat (the essential), hajiyyat (the complementary) as well as tahsiniyyat (the desirable or the embellishments) [20, 52].

In [48] assert that the establishment of dharuriyyat is considered to protect and promote individual's survival and spiritual well-being which are very essential. On the other hand, the second category i.e. hajiyyat is related to measures taken into account to minimize hardship and severity (such as shortening the prayer and forgoing the fast by the traveller) [18]. In other words, concessions are granted to lessen inability when performing obligatory action (ibadah) [24]. The third category of maqasidshariah which is tahsiniyyat refers to

attempts of attaining refinement and perfection in individual's conduct and customs. Thus, it is apparent that all these prescribed shariah purposes are vital to ensure justice, balance and harmony in the entire human operation, moral and religious perfection, fair realization of one's responsibility and human welfare [46]. She further extends maqasid shariah into five major principles:

i. Preserving the sanctity and religious beliefs.
ii. Ensuring the safety of life and the human body
iii. Ensuring the purity and sanity of mind.
iv. Ensuring the honour and dignity.
v. Ensuring ownership and control of property.

To further highlight, it is reported that the Prime Minister of Malaysia, Datuk Seri NajibTun Razak launched the Malaysian Shariah Index (MSI) in conjunction with the Premier Conference of Ulama and Umara 2015 at the Putrajaya International Convention Centre (PICC) held on 10 February 2015. The conference was organized by Islamic Development Department Malaysia (JAKIM) together with the International Islamic University Malaysia (IIUM) and the Islamic Da'wah Foundation Malaysia (YADIM). It was intended to measure and evaluate the performance of Malaysia in implementing Islamic laws based on the five objectives of the shariah and at the same time covering eight key areas of legal, political, economic, education, health, culture, infrastructure and the environment as well as social. MSI existence shows that the Malaysian government is persistent, transparent and honest in measuring the effort and commitment that has been carried out based on the maqasidshariah in order to enshrine Islamic laws, to boost economic development and to raise the nation. This will take into consideration the progress of each sector, area and component that will contribute to a well-developed, progressive and high income country by 2020 [25]. Coinciding with the MSI, science and technology should be following the objectives of maqasidshariah in order to avoid distortion, degradation of faith and morality, destruction of property, the spread of diseases and other negative implications to society. In [16, 17] have been using the five elements of maqasidshariah (religion, life, intellect, lineage and property) as a constructive framework in the research model of quality of life (I- QoL) to a number of drug offenders through rehabilitation of spiritual and moral programmes and also at a few drug rehabilitation centers around Terengganu, Malaysia. Meanwhile, in [29, 30] further explains the relationship of three elements of maqasidshariah (life, mind & lineage) with human genetic research, breeding technology and also the use of rotavirus vaccines to children who suffer from diarrhea and lung disease.

Besides that, in [44] elaborate that maqasidshariah is actually a complement to conventional bioethics in the solution of ethical issues whereby it should be a point of reference and adoption in modern biotechnology applications. Furthermore, in [2, 3] debated that the role of forensic biology is to ensure that the maqasidshariah is incorporated for instance in the aspects of justice to convict a criminal offense through fingerprint evidence, dental, DNA analysis and serology to name a few. In another study, in [21] evaluate biomedical issues involving Sex Assignment Surgery (SAS) to infants with Disorders of Sex Development (DSD) using maqasidshariah as the medium. Not only that, in [36] also debated the issue of medical decision making which emphasizes the religious aspect specifically in end-of-life decision procedure. To add, in [33] clarify the issues of sustainable development involving environmental issues and green technology with maqasidshariah as the main core. In [7] discuss maqasidshariah from the aspect of neuroscience such as brain imaging and other issues involving the role of religion in science and medical technology. This shows that the maqasidshariah is the basic element that links between religion and technology. This is also to ensure the balance of considerations to avoid damage, destruction and abuse in the lives of mankind.

Hence, research and development in Islamic Aqeedah Compliance Index towards Malay Genome in Malaysia is an effort to harmonize the development of modern science and technology with the Islamic principles. This is to ensure that there is no conflict that can undermine human values and corrupt the nature. In addition, the research is multidisciplinary that also coincides with the thrust of the 4th National Biotechnology Policy which encourages more extensive multi-disciplinary researches. Apparently, this is significant in order to enhance technology development and also to produce new knowledge to achieve the ultimate target as documented in the National Key Economic Areas (NKEA) particularly in local and international tertiary education sectors. Therefore, this study is anticipated to contribute a new body of knowledge with significant integration of both fields i.e. Islamic Studies as well as Biotechnology.

CONCLUSION

Quran as a major reference in the study has made it possible for the researchers to explore genome areas in Malaysia as well as around the world in depth. Until now, human genome research involving Malays purely focuses on medical aspects. Therefore, further studies on Malay genomes from the perspective of Islam are seen necessary so that the publics are aware of its implications on faith and the quality of life.

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