Jurnal Hadratul Madaniah, Volume 12, Issue 2, December, 2025. Page 82–92
p-ISSN:2407-3865, e-ISSN:2655-1993

The Relevance Of Modern Cell Theory to The Verse Of The Qur'an About The Creation Of Living Creatures

Muqor Rama Hasanah [1*], Ahmad Syarif [2], Noor Fadillah[3]

[1]Biology Education, Faculty of Lagnage Science and Technology, Muhammadiyah University of Palangka Raya
[2]Islamic Religious Education, Faculty of Islamic Religion, Muhammadiyah University of Palangka Raya
[3]Department of Medical Laboratory Technology, Faculty of Medical Laboratory Technology, Muhammadiyah University of Palangka Raya

Email: muqoramahasanah@umpr.ac.id

Abstract. *Modern cell theory is the basis of biological understanding which states that cells are the structural and functional units of life, cell division underlies growth and reproduction, and each cell originates from the previous cell. This study aims to analyze the relevance of modern cell theory to the verses of the Qur'an regarding the creation of living things. The study was conducted in May - June 2025 at the Biology Education Study Program, Muhammadiyah University of Palangkaraya using qualitative methods and a literature study approach. Data were collected through a search of cell biology literature and interpretation of Qur'anic verses regarding the creation of living things. Data analysis was carried out by content analysis through data reduction, data presentation, and drawing conclusions. The results of the study indicate that the concept of cells as structural and functional units of life is in line with QS Al-Anbiya' [21]:30 about water as the basis of life, the concept of cell division (mitosis and meiosis) is in line with QS Al-Mu'minun [23]:13-14 about embryonic development, the concept of differentiation and cell specialization is relevant to QS Al-Alaq [96]:2 about the creation of humans from 'alaqah, and the concept of Omnis cellula e cellula is in line with QS Az-Zariyat [51]:49 about the creation of pairs. The conclusion of this study shows the integration of science and Islam that mutually strengthen the understanding of cell biology and the value of faith. This study is expected to be the basis for the development of Cell Biology teaching materials based on the integration of science and Islam to improve scientific literacy and the religious character of students.*

Keyword: *Al-Qur'an, Cell theory, Integration of Islamic science*

INTRODUCTION

Cells are the smallest structural and functional units that make up living things. Modern cell theory was first proposed by Schleiden and Schwann in the 19th century, which stated that all living things are composed of cells, cells are the basic unit of life, and cells originate from the division of previous cells (Alberts et al., 2015) (Hasanah et al., 2025) . The development of Cell Biology research

continues to this day, marked by the discovery of various cellular level life mechanisms, such as DNA replication, gene expression, mitosis and meiosis division, and cellular differentiation that underlie the growth and development of living things (Lodish et al., 2016; Campbell et al., 2018). Understanding modern cell theory is an important foundation in studying other branches of Biology, such as genetics, physiology, microbiology, and biotechnology (Purves et al., 2014). However, Cell Biology learning in universities generally only emphasizes conceptual and practical aspects, without linking scientific concepts to Islamic values derived from the Qur'an (Nasution, 2018). In fact, the integration of science and religion is highly urgent in Biology Education to foster awareness of the majesty of God's creation and strengthen students' faith as future Biology educators with a monotheistic character (Al-Attas, 1993).

The Qur'an as the holy book of Muslims contains kauniyah verses that are relevant to the concept of cell theory. QS Al-Anbiya' verse 30 states that "And We created from water every living thing," which is scientifically relevant to the fact that ±70-90% of the cell mass is composed of water, acting as a medium for biochemical reactions and the main component of cell protoplasm (Alberts et al., 2015; Campbell et al., 2018). In addition, QS Al-Mu'minun verses 12-14 explain the creation of humans from soil, nutfah, 'alaqah, to mudhghah, which is in line with the concept of gradual human embryonic development through cell division, differentiation, and specialization (Moore & Persaud, 2013).

Previous research by Hasanah (2022) showed that integrating Kauniyah verses into Cell Biology learning improved students' understanding of religious concepts and attitudes. Similarly, Rahmawati et al. (2021) found that an integrated science-Islamic approach to Biology learning increased motivation and appreciation of religious values. However, specific studies on the relevance of modern cell theory to Quranic verses on the creation of living things are still limited, especially as a basis for developing integrative teaching materials in Biology Education study programs.

The problem that emerged in this study is the suboptimal integration of modern cell theory with the verses of the Qur'an about the creation of living things in Biology learning, so that scientific concepts and spiritual values have not been fully internalized by students. Therefore, an in-depth analysis is needed to find the point of relevance between the two, in order to enrich the learning material of Cell Biology with the perspective of integration of science and Islam. Based on the description, the purpose of this study is to analyze the relevance of modern cell theory with the verses of the Qur'an about the creation of living things, so that it can be used as a basis for

developing Cell Biology teaching materials based on the integration of science and Islam in Biology Education learning.

METHOD

This study employed a qualitative research design with a library research approach, as its primary focus was to analyze cell biology literature and interpret Quranic verses related to the creation of living beings to determine their relevance. The research was conducted over two months, from May to June 2025, within the Biology Education Study Program, Faculty of Language, Science, and Technology, Muhammadiyah University of Palangkaraya. All data were obtained from literature sources accessed through libraries and electronic journals. In this study, the researcher acted as the main instrument (human instrument), responsible for searching, selecting, analyzing, and interpreting data from relevant literature and Quranic verses. To maintain objectivity, every step of data search and collection was recorded systematically and validated through source triangulation. The research population encompassed all literature discussing modern cell theory and Quranic verses on the creation of living beings. Samples were selected based on specific inclusion criteria, including Cell and Molecular Biology textbooks published within the last ten years, national and international journals related to cell theory, and Quranic verses along with their tafsir that address concepts of creation.

The data consisted of two primary categories. The primary data were derived from the Qur'an and authoritative tafsir works, such as Tafsir Al-Misbah, Tafsir Ibn Kathir, and Tafsir Al-Maraghi. Secondary data included Cell and Molecular Biology textbooks (Alberts, Lodish, Campbell), previous research articles, and journals focusing on the integration of science and Islam. The instruments used for data collection were literature review sheets and verse analysis sheets, developed by the researcher to guide the systematic search, documentation, and analysis of data. The research procedure involved several stages: preparation, data collection, documentation, and data analysis. In the preparation stage, the researcher determined the research focus and developed the required instruments. Data collection involved retrieving cell biology literature from libraries and electronic databases such as ScienceDirect, SpringerLink, and ResearchGate, and identifying relevant Quranic verses through tafsir studies. All retrieved data were documented in analysis tables before undergoing further analysis. Data were analyzed using content analysis, which included data reduction, data presentation, and drawing conclusions regarding the relevance of modern cell theory to Quranic descriptions of the creation of living beings.

Data analysis was conducted descriptively and qualitatively, beginning with an in-depth review of cell theory literature and the interpretation of Quranic verses. Relevant themes connecting cell theory to Quranic narratives of creation were then identified. Subsequently, integrative conclusions were drawn to demonstrate the relationship between the two. Data validity was ensured through source triangulation, involving comparisons across various cell biology literature, Quranic exegesis, and previous research. Validation was further strengthened through consultations with experts in science–Islam integration and scholars of Quranic exegesis to ensure the accuracy of verse interpretation. Through these systematic steps, this study provides a methodological framework that allows for replication by future researchers.

FINDINGS

The findings of this study are presented concisely and directly aligned with the research objectives, supported by data and interpretations from both cell biology literature and Quranic exegesis. The results indicate four main points of relevance between modern cell theory and Quranic verses regarding the creation of living beings.

First, the analysis shows that the concept of the cell as the structural and functional unit of life aligns with QS Al-Anbiya' [21]:30, which emphasizes water as the basis of all living things. Literature review data confirm that water constitutes approximately 70–90% of cell mass and is essential for biochemical reactions, thus supporting the interpretation of the verse.

Second, the study finds a clear parallel between cell division (mitosis and meiosis) and the stages of human embryonic development described in QS Al-Mu'minun [23]:13–14. Evidence from embryology literature shows that fertilization, zygote formation, and sequential embryonic development occur through regulated cell division, consistent with the Quranic description.

Third, the findings indicate that cell differentiation and specialization are relevant to QS Al-Alaq [96]:2. The verse refers to the early embryonic 'alaqah stage, which biologically corresponds to implantation and the onset of cellular differentiation. This is supported by embryology studies documenting the activation of specific genes leading to tissue and organ formation.

Fourth, the principle of *Omnis cellula e cellula*—that every cell arises from a pre-existing cell—is shown to be in harmony with QS Az-Zariyat [51]:49 regarding the creation of pairs and the continuity of life. Data from molecular biology literature highlight cell division as the mechanism sustaining regeneration and reproduction across living organisms.

Overall, the findings collectively support the conclusion that modern cell theory demonstrates significant compatibility with Quranic descriptions of creation. These results provide sufficient empirical and textual evidence to underpin the integration of scientific concepts with Islamic teachings in Cell Biology education.

DISCUSSION

The results of this study present the relevance of modern cell theory to Quranic verses concerning the creation of living things. The analysis is based on the main themes of modern cell theory linked to Quranic verses and their interpretations.

Table 1. Relevance of Modern Cell Theory to the Verses of the Qur'an about the Creation of Living Creatures

No	Modern Cell Theory	Related Quranic Verses and Interpretation	Relevance
1	Cells as the structural and functional units of life	QS Al-Anbiya' [21]:30 *"…And We made from water every living thing…"* Ibn Kathir's interpretation: All living things depend on water for their existence. Al-Misbah's interpretation: Water is the basic element of life that supports all biological processes of living things.	Cell theory states that cells, as the basic unit of life, consist of approximately 70-90% water, which functions as a metabolic medium, a solvent for substances, and conducts important biochemical reactions in the cytoplasm (Campbell et al., 2018). Water is an essential substance that forms the structure and function of cells, enabling them to carry out their life processes.
2	Cell division (mitosis and meiosis)	QS Al-Mu'minun [23]:13-14 *"...Then We made the semen (which was stored) in a firm place... then it became a clot of blood ('alaqah), then it became a clot of flesh (mudhghah)..."* Tafsir Al-Maraghi: This verse explains the stages of development of the human embryo from the time the sperm meets the ovum, becomes a zygote, attaches to the uterus, then develops stage by stage. Tafsir Al-Misbah: Describes the gradual process of human creation according to complex and orderly biological development.	In cell theory, mitosis plays a role in the growth and formation of embryonic tissue, while meiosis produces gametes (sperm and ovum), which are the basis for fertilization. The zygote divides by mitosis, developing into a blastula, gastrula, and finally organogenesis, as explained in the verse (Moore & Persaud, 2013; Alberts et al., 2015).

3	Cell differentiation and specialization	QS Al-Alaq [96]:2 *"He created man from a clot of blood ('alaq)."* Ibn Kathir's interpretation: 'Alaqah is interpreted as a clot of blood hanging in the uterus. Al-Misbah's interpretation: Indicates the phase of embryonic development that is firmly attached to the uterine wall and undergoes the formation of organ structures.	Cell differentiation is the process by which embryonic cells transform into various specialized cell types that make up tissues and organs, through the activation of specific genes (Sadler, 2012; Alberts et al., 2015). This verse describes the 'alaqah phase, which is the gastrulation and early differentiation stage in human embryogenesis.
4	Cells come from previous cells (Omnis cellula e cellula)	QS Az-Zariyat [51]:49 *"And We created everything in pairs so that you may remember (the greatness of Allah)."* Tafsir Al-Maraghi: Everything in this universe was created in pairs, showing balance and continuity of life.	The Omnis cellula e cellula theory asserts that every cell originates from a previous cell through a process of division (mitosis or meiosis). Cell division is the basis for regeneration, growth, and reproduction, ensuring the continuity of life in living things, as stated in the verse (Lodish et al., 2016; Campbell et al., 2018).

A. Integration of Modern Cell Theory with the Verses of the Qur'an

The results of the study indicate that modern cell theory has a close relevance to the verses of the Qur'an regarding the creation of living things. The concept of cells as structural and functional units of life is in accordance with QS Al-Anbiya' [21]: 30 which states that Allah created all living things from water. Campbell et al. (2018) emphasized that water makes up ± 70-90% of the cell mass, acts as a medium for biochemical reactions, a solvent for substances, and maintains the structural stability of cells. Tafsir Ibn Kathir (2000) and Quraish Shihab (2002) stated that this verse indicates the dependence of all living things on water for their continued existence. This finding strengthens the results of Nasution (2018) who stated that the kauniyah verses have relevance to basic scientific concepts, including cells.

The concept of cell division (mitosis and meiosis) which is the basis for the growth, development, and reproduction of living things is relevant to QS Al-Mu'minun [23]:13-14 regarding the stages of human embryo development from nutfah (zygote), 'alaqah (a clot of blood), to mudhghah (a lump of flesh). *Moore & Persaud (2013)* and *Sadler (2012)* explain this process as the

division of zygote cells through mitosis until an embryo with tissue and organ structure is formed. Tafsir Al-Maraghi (1989) emphasizes that this verse shows the gradual and orderly creation of humans, according to the concept of modern embryology.

The concept of cell differentiation and specialization, which enables the formation of specialized tissues and organs, is explained in QS Al-Alaq [96]:2. Sadler (2012) states that cell differentiation occurs during the gastrulation phase through organogenesis, while Tafsir Ibn Kathir (2000) interprets 'alaqah as the phase of the embryo hanging in the uterus and undergoing structural formation. This finding supports the findings of Rahmawati et al. (2021) that the integration of science and the verses of kauniyah increases students' learning motivation and understanding of biological concepts.

The concept of Omnis cellula e cellula (every cell comes from the previous cell) is relevant to QS Az-Zariyat [51]:49 about the creation of pairs which shows the continuity of life. Lodish et al. (2016) explain that cell division is a basic mechanism for continuing the life of living things through regeneration and reproduction. Tafsir Al-Maraghi (1989) interprets that the creation of pairs is a sunnatullah to maintain the balance and continuity of life.

B. Research Novelty

The novelty of this research lies in its integrative analysis, specifically linking modern cell theory with the interpretation of Quranic verses on the creation of living things, rather than merely mentioning the general connection between science and the Quran as done by Hasanah (2022) and Rahmawati et al. (2021). This research details the biological processes of cells, from basic structure, division, differentiation, to cell reproduction, from the perspective of the Kauniyah verses, and examines their spiritual and philosophical meanings.

C. Research Implications

The results of this study have important implications for the development of Cell Biology learning based on the integration of science and Islam. This analysis can serve as the basis for developing Cell Biology teaching materials and modules that not only incorporate modern scientific concepts but also internalize the values of faith and monotheism in students. This aligns with the goal of Islamic Biology Education to produce graduates who master science and possess strong religious character (Al-Attas, 1993). These findings also contribute to the development of integrative

education in Islamic higher education, which emphasizes the importance of linking cell biology concepts with Quranic verses to enhance students' scientific and spiritual literacy.

CONCLUSION

Based on the results of the research and discussion, it can be concluded that modern cell theory has a strong relevance to the verses of the Qur'an regarding the creation of living things. The theory of cells as structural and functional units of life is in line with QS Al-Anbiya' [21]:30 which emphasizes water as the basis of life. The concept of cell division (mitosis and meiosis) is in line with QS Al-Mu'minun [23]:13-14 regarding the developmental stages of human embryos. Cell differentiation and specialization are relevant to QS Al-Alaq [96]:2 regarding the creation of humans from 'alaqah, while the theory of Omnis cellula e cellula is in line with QS Az-Zariyat [51]:49 regarding the creation of pairs which shows the continuity of life. The novelty of this research is the integrative analysis that links in detail modern cell theory with the interpretation of the verses of the Qur'an regarding the creation of living things, thus producing a comprehensive understanding of the integration of science and Islam in Cell Biology. This research has implications for the development of Cell Biology teaching materials based on the integration of science and Islam that can improve conceptual understanding, spiritual appreciation, and build the religious character of Biology Education students at Islamic universities.

REFERENCES

Al-Attas, SMN (1993). Islam and secularism . International Institute of Islamic Thought and Civilization.

Alberts, B., Johnson, A., Lewis, J., Morgan, D., Raff, M., Roberts, K., & Walter, P. (2015). Molecular biology of the cell (6th ed.). Garland Science.

Angela, L., & Aflian, M. (2025). Bridging ethnobotany and Islam: Measuring the feasibility and practicality of an ethnobotany textbook integrated with Islamic values. Al Jahiz: Journal of Biology Education Research, 6 (1), Jan–Jun 2025.

Ardi, A., Lufri, L., Amran, A., Kosasih, A., & Hervi, F. (2024). The effect of Islam and science integration implementing on science learning in Indonesia: a meta-analysis . International Journal of Evaluation and Research in Education , 13(4), 2594–2602. https://doi.org/10.11591/ijere.v13i4.27632.

Brown, L.A., & Islam, R. (2024). From conflict to harmony: Changing conceptual ecology of evolution for Muslim students. Evolution: Education and Outreach, 17 , Article 14.

Light . (2024). Integration of Qur'anic and Hadith values in evolutionary learning through module development. Journal of Universal Academic Biology Education , online first Dec 24, 2024

Campbell, NA, Urry, LA, Cain, ML, Wasserman, SA, Minorsky, PV, & Reece, JB (2018). Biology (11th ed.). Pearson.

Damri, D., Irawadi, H., Elvarisna, E., Sari, R., & Hidayat, R. (2024). Islamic education management: Integration of science, arts, and professions in optimizing the education system. Indonesian Accounting Research Journal , 12(2), 53–60. https://doi.org/10.35335/iacrj.v12i2.367 ResearchGate+1ijere.iaescore.com+1 journals.iarn.or.id

Desfita, V., Salminawati, S., & Usiono, U. (2024). Integration of science in the perspective of Islamic educational philosophy and its implications in realizing holistic education. As Salam Journal , 8 (2), 114–134. https://doi.org/10.37249/assalam.v8i2.714

Fina, F., et al. (2024). Measuring the impact of Islamic values based on scientific literacy on students' faith and scientific competence. International Journal of Literacy, Teaching, and Education Research . (Fakhrurrazi et al., 2024) Hasanah, MR, Zannah, F., Aufa, MN, & Nurkhaliza, GN (2025). Analysis of Learning Needs for Cell Biology: a Study From the Perspectives of Lecturers and Students in Palangka Raya City . XI (1), 26–32.

Hasanah, MR, Zannah, F., Aufa, MN, & Nurkhaliza, GN (2025). Analysis of Learning Needs for Cell Biology: a Study From the Perspectives of Lecturers and Students in Palangka Raya City . XI (1), 26–32.

Hasanah, MR (2022). Integration of Kauniyah verses in cell biology learning to improve students' understanding of concepts and religious attitudes. Indonesian Journal of Biology Education, 8 (3), 245–252.

Lodish, H., Berk, A., Kaiser, C.A., Krieger, M., Bretscher, A., Ploegh, H., Amon, A., & Scott, M.P. (2016). Molecular cell biology (8th ed.). WH Freeman and Company.

Mirza, U. J. (2024). Islamic scientific critical consciousness as a theoretical framework for Muslim science educators. London Review of Education , 22(1). https://doi.org/10.14324/LRE.22.1.09

Moore, K. L., & Persaud, TVN (2013). The developing human: Clinically oriented embryology (9th ed.). Saunders.

Muslim Indonesian prospective biology teachers' admission... (2024, Sep 27). Evolution: Education and Outreach , 17, Article 15. https://doi.org/10.1186/s12052-024-00206-z

Nasution, AS (2018). Integration of science and religion in biology learning at Islamic universities. Indonesian Journal of Biology Education, 4 (2), 145–151.

Quraish Shihab, M. (2002). Tafsir Al-Misbah: Message, impression and harmony of the Qur'an (Vols. 1–15). Lentera Hati.

Rahmawati, I., Zubaidah, S., & Susilo, H. (2021). The integration of science and Islamic values in biology learning to increase students' motivation and spiritual attitudes. Journal of Physics: Conference Series , 1796, 012037. https://doi.org/10.1088/1742-6596/1796/1/012037

Rahman, F.B., & Noh, MAC (2021). Implementation of the Al Quran and science integration approach at the Asajaya regional middle school. Al-Hayat: Journal of Islamic Education, 5 (2), 240–256. https://doi.org/10.35723/ajie.v5i2.204

Sadler, T. W. (2012). Langman's medical embryology (12th ed.). Lippincott Williams & Wilkins.

Tafsir Al-Maraghi. (1989). Tafsir Al-Maraghi . Al-Kautsar Library.

Tafsir Ibn Kathir. (2000). Tafsir Ibn Kathir (Volumes 1–9). Imam Asy-Shafi'i Library.

Zahroh, F., & Faridah, S. (2022). The effect of the integration model of mathematics and the Koran on learning outcomes and motivation of PGMI students at IAIN Madura. Proceedings of ICIED 2019 , 4, 27–31.

Agusna, S., Manalu, K., & Rasyidah. (2022). The effect of Jigsaw-type cooperative learning model on respiratory system material integrated with Al Qur'an surah Al-An'am on learning outcomes. Symbiotic: Journal of Biological Education and Science, 3 (1), 19 26.

Amal, A., Nur, AM, & S., MI (2022). The influence of the practical module of basic science concepts integrated with Al-Islam Kemuhammadiyahan in the formation of religious character. Basicedu Journal, 6 (1), 1098–1106. https://doi.org/10.31004/basicedu.v6i1.2174

Hildayatni, D., Triwoelandari, R., & Hakiem, H. (2019). The feasibility of an integrated science learning module with religious values to develop the character of curiosity. Journal of Madrasah Ibtidaiyah Education, 3 (2), 203–218.

Sulman, F., Tanti, T., Habibi, M., & ZB, A. (2021). The effect of animated media with Islamic characters on learning outcomes of earth and space knowledge. Edumaspul: Journal of Education, 5 (1). https://doi.org/10.33487/edumaspul.v5i1.1044

Hartono, A., et al. (2024). The urgency of biology teaching materials based on Islamic values. International Journal on Advanced Science, Education, and Religion , 7(1). journals.uclpress.co.uk BioMed Central+1BioMed Central+1 ResearchGate Al-Furqan Journal