

Chapter 11

Genetic Engineering for Halal Vaccines: Biochemical Transformation in Production and Economies of Scale

Hairrudin Hairrudin

 <https://orcid.org/0000-0002-1628-5376>

University of Jember, Indonesia

Khairunnisa Musari

 <https://orcid.org/0000-0003-0525-9903>

Kiai Haji Achmad Siddiq State Islamic University, Indonesia

ABSTRACT

The increasing global halal awareness also impacts the world of health. In the world of health, vaccination is one of the simplest, safest, and effective ways to protect humans from dangerous diseases. Vaccinations are still vulnerable to criticism for their halal status because the enzymes used in the past were mostly sourced from non-halal or prohibited materials. Now, through genetic engineering, enzymes sourced from non-halal or prohibited materials can be replaced. Indeed, one of the critical points of vaccine production is enzymes. As catalysts for organic chemical or biochemical reactions, enzymes are critical points in halal pharmaceuticals, including halal vaccines. Therefore, by embracing literature review and case studies, this chapter will focus on three issues as a discussion: (1) the mainstream biochemical process in vaccine production; (2) biochemical transformation of halal vaccine production through genetic engineering; (3) implications of halal vaccine production through genetic engineering for economies of scale.

DOI: 10.4018/979-8-3373-3917-7.ch011

BACKGROUND

The increasing global halal awareness has also influenced the world of health. Halal pharmaceuticals are one of the high-priority development areas in the health world which can be used to measure the progress of the halal sector. In 2022, consumer opportunity on halal pharmaceuticals was represented by US\$108 billion of spending by 2 billion Muslims worldwide with the government leadership from Southeast Asian and European countries dominating this sub-sector (DinarStandard, 2023). Unfortunately, Muslims have not explored largely halal pharmaceuticals much, perhaps because the consumption of non-halal products in life-threatening situations is permitted under Islamic law (Shari'ah), so the issue of halal in terms of pharmaceuticals is often considered irrelevant (Noronha, 2020).

In the world of health, one of the issues in the halal pharmaceutical sub-sector that has been documented to have experienced polemics several times is vaccines. In the Muslim world, indeed, vaccines are polemical especially because apart from being expensive, it is also related to the status of their use in the medication, whether it is halal or not (Ahmad, 2022). In Malaysia, religious beliefs were viewed as one of the core influences for refusing vaccination (Khoo, Ghani, Navamukundan, Jahis, and Gamil, 2020). Likewise in Indonesia, the diversity of understandings regarding vaccines and their ingredients raises issues about halal and non-halal among the community, the core of which is triggered by two important elements, namely culture and theological concepts (Wiryadinata, 2023). Therefore, raising awareness of these elements may create a broader ethical consumer base for halal pharmaceuticals (Noronha, 2020).

Indeed, immunization with unclean and/or haram vaccines may be permissible under several conditions, namely when used in *al-hajat* or an emergency condition, holy and halal vaccine materials have not been found, and there is information from trusted and competent medical personnel that there is no halal vaccine (Sholeh and Helmi, 2021). This is the reason why a study by Sudarsono, Ikawati, Kurnia, Azizah, and Kholid (2024) in 32 Indonesia's provinces with 725 Muslim respondents found that religiosity, halal knowledge, and halal certification did not influence Muslims' intention to use halal vaccines at the time of COVID-19. The fatwa by the Indonesian Council of Ulama (MUI), which allowed the use of the vaccine despite containing haram ingredients, was perceived as justification for Muslims to receive non-halal vaccines.

Further, a study by Nugroho, Santoso, and Herawati (2024) of 200 respondents who had consumed the halal-labeled Flu-Bio, CoronaVac, and Vac2Bio vaccines in the Solo Raya area, Indonesia, indicated that beliefs about vaccine efficacy, awareness of halal vaccines, and the presence of a halal label directly impact purchasing behavior. Therefore, the study by Sudarsono, Ikawati, Kurnia, Azizah, and

28 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/genetic-engineering-for-halal-vaccines/377439

Related Content

Exploring Bilingual Dynamics: Students' Perspectives in Islamic Studies Classrooms Across English and Arabic Medium International Schools
Syeda Rabia Tahir (2024). *International Journal of Contemporary Islamic Studies* (pp. 1-12).
www.irma-international.org/article/exploring-bilingual-dynamics/360654

Exploring Bilingual Dynamics: Students' Perspectives in Islamic Studies Classrooms Across English and Arabic Medium International Schools
Syeda Rabia Tahir (2024). *International Journal of Contemporary Islamic Studies* (pp. 1-12).
www.irma-international.org/article/exploring-bilingual-dynamics/360654

An Islamic Faith Perspective on Using Social Media / Mainstream Media to Prompt Organ Donation/ Transplantation Awareness: Going Beyond Science- Nephrology
Shahid Muhammad (2021). *Research Anthology on Religious Impacts on Society* (pp. 799-807).
www.irma-international.org/chapter/an-islamic-faith-perspective-on-using-social-media-mainstream-media-to-prompt-organ-donation-transplantation-awareness/259644

Exploring Bilingual Dynamics: Students' Perspectives in Islamic Studies Classrooms Across English and Arabic Medium International Schools
Syeda Rabia Tahir (2024). *International Journal of Contemporary Islamic Studies* (pp. 1-12).
www.irma-international.org/article/exploring-bilingual-dynamics/360654

Historiography of the Problem
(2022). *Examining the Relationship Between the Russian Orthodox Church and Secular Authorities in the 19th and 20th Centuries* (pp. 1-15).
www.irma-international.org/chapter/historiography-of-the-problem/306118