



# Impact of Artificial Intelligence on the Development of Breast Cancer Vaccines in Iran

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## ABSTRACT

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**Introduction:** Breast cancer is the most common malignancy among women. Artificial intelligence (AI) offers a promising and powerful aid in designing and applying anti-cancer vaccines. Breast cancer is an interesting target for designing AI-based vaccines. The present review aims to summarize the state of the art and explore the perspective of AI-based methods in the designation and application of breast cancer vaccines in Iran.

**Search Strategy:** This review performed a comprehensive search in English and Persian databases from January 2020 to March 2024. We searched the keywords "vaccine," "artificial intelligence," "AI," "cancer," "malignancy," and "breast cancer" and their synonyms in research databases, including PubMed, Web of Science, Science Direct, Google Scholar, and Magiran. After primary and secondary screenings, related articles will be included in the study.

**Results:** A total of 10300 articles with related keywords were searched, and 15 articles finally met the inclusion criteria and entered the study. Our review emphasized the revolutionizing role of AI in developing various anti-cancer vaccines. Although studies regarding the development of AI-based vaccines against breast cancer are limited in Iran, our findings indicate that computational techniques, most importantly AI, could rapidly design shared neoantigen T cell epitopes advancing and developing the field of off-the-shelf cancer vaccines and hold the promise of significantly benefiting patients.

**Conclusion and Discussion:** AI is a potential tool for the designation and application of anti-cancer vaccines. Although research in breast cancer is scarce, it is a potential target for designing vaccines using AI-based methods. Future studies should prioritize the development of AI-based methods for developing effective breast cancer vaccines.

#### Citation:

Eslamzadeh S, Sahebi K, Fereidouni A. Impact of Artificial Intelligence on the Development of Breast Cancer Vaccines in Iran. *Iranian biomedical journal*. Supplementary (12-2024): 81.

**Keywords:** Artificial intelligence, Breast cancer, Cancer, Vaccine