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Innovative Practices in Nanotechnology through Artificial Intelligence

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Editorial

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Abstract

Emerging applications of AI in medicinal chemistry include nanotechnology and nanorobots. Nanoparticles are made to carry pharmaceuticals more effectively and efficiently. nanorobots can be trained to deliver drugs to specific targets, monitor treatment efficacy, and even perform cellular surgery. AI technology is anticipated to grow significantly as new medications and treatments are developed. The paper shows how multiple artificial intelligence and machine learning methodologies were combined with sophisticated approaches for medical nanotechnology applications.

Keywords: Nanotechnology; Artificial Intelligence; Nanorobots

Introduction

The application of artificial intelligence to previously accessible data sets can aid in identifying new medications. When developing a drug from a large, complicated molecule, the AI-based design is functional, unlike the difficulty of manufacturing a medicine [1]. This works well for revealing hidden patterns in large, complex molecules. Numerous artificial intelligence design scans are employed to find the active component in medicine and to synthesise novel drugs [2]. Drug sales now fetch an average price of more than $3 billion. Approving a treatment for human use requires about 80–85% of clinical trials, which adds to the rising expense of healthcare. Second, a significant time and resource investment is necessary because the drug design cycle is complex [3]. The aim of nanotechnology in the medical sciences is to develop innovative materials and methods for the precise, effective, long-lasting, and targeted detection and treatment of illness. As a result, medical operations will be less invasive and safer [4]. Applying artificial intelligence (AI) algorithms to analyse large datasets and spot complex patterns can help develop nanotechnologies for diagnosis and treatment.

Artificial Intelligence and Nanotechnology in Medicine

The domains of nanotechnology and artificial intelligence are closely linked and play a crucial role in developing novel pharmaceuticals and determining the most effective treatment plan for individual patients. AI and nanotechnology could be combined in many ways in medicine. The characteristics of materials and things created at the nanoscale differ significantly from those of comparable chemical compounds made at larger dimensions. Creating nanosensors based on and utilising AI is another critical idea in merging nanotechnology and AI [5].

Application of Nanorobots

Medical nanorobots are capable of a wide range of tasks for diagnosing, tracking, and treating critical disorders.

These nanorobots can deliver medication to specific areas or body sections. Among the uses for nanorobots are the following: Gene therapy, Cancer detection and treatment, Dentistry, Drug delivery, Body surveillance (Kidney, Nerves repairing) etc.

Discussion & Conclusion

Pharmaceutical chemistry is significantly impacted by artificial intelligence. This review centres on the diverse applications of artificial intelligence in medicinal chemistry. This automated approach solves medicinal chemistry problems more effectively and quickly. In the past, artificial intelligence proved helpful in creating essential and intricate molecules. Generating new molecules and ascertaining their various attributes can be comparatively straightforward when an algorithm driven by artificial intelligence and a database is employed. The primary function of AI in the drug design process is the assessment of a medication's structural characteristics.

Future Scope

In the future, medical nanorobots might be used for eye surgery. Since nanorobots are safe for all patients to employ during surgery and medical treatments, they are an invaluable tool for identifying the cause of terrible diseases. Smaller nanorobots are used to reduce the risk of tissue harm. In the biotechnology sector, where the diffusion of knowledge is prioritised over medical therapy, nanorobotics could potentially be helpful. Its design will guarantee that the data is transmitted to the brain.

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References

1. Zhavoronkov A (2018) Artificial intelligence for drug discovery, biomarker development, and generation of novel chemistry. Molecular Pharmaceutics 15(10): 4311-4313.

2. Domenico A, Nicola G, Daniela T, Fulvio C, Nicola A, et al. (2020) De novo drug design of targeted chemical libraries based on artificial intelligence and pair-based multiobjective optimization. Journal of Chemical Information and Modeling 60(10): 4582-4593.

3. Díaz Ó, Dalton J A, Giraldo J (2019) Artificial intelligence: a novel approach for drug discovery. Trends in pharmacological sciences 40(8): 550-551.

4. Idrees M (2015) Role of nanotechnology in medical sciences: a review. Int J Innov Drug Discov 5(1): 14-24.

5. Kosaka PM, Pini V, Ruz JJ, Da Silva RA, González MU, et al. (2014) Detection of cancer biomarkers in serum using a hybrid mechanical and optoplasmonicnanosensor. Nature nanotechnology 9(12): 1047-1053.