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| Journal Name: | [**Asian Journal of Research in Computer Science**](https://journalajrcos.com/index.php/AJRCOS) |
| Manuscript Number: | **Ms\_AJRCOS\_141221** |
| Title of the Manuscript: | **AI-Driven Therapeutic Molecule Design for Rare Genetic Diseases with Integrated Cloud Cybersecurity Framework for Healthcare Data Protection** |
| Type of the Article | **Review Article** |

**PART 1: Comments**

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|  | **Reviewer’s comment**   |  |  | | --- | --- | | **Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer** | | | **review.** |  | | **Author’s Feedback** (It is mandatory that authors should write his/her feedback here) |
| **Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.** | This manuscript holds significant relevance for the scientific and medical research community as it brings together two critical and emerging domains: artificial intelligence (AI)-driven therapeutic development for rare genetic diseases and the imperative need for integrated cloud cybersecurity frameworks in healthcare. Rare genetic disorders affect an estimated 300 million people globally, yet they often suffer from prolonged diagnostic timelines and insufficient therapeutic solutions. This review underscores how AI, particularly in facial phenotyping and genomic data analysis, offers transformative potential in early diagnosis and precision medicine. By pairing this with cybersecurity strategies like differential privacy and homomorphic encryption, the paper proposes a necessary dual-focus framework that ensures both innovation and patient data protection. The integrative perspective contributes significantly to the literature, bridging gaps between biomedical AI applications, ethics, and cybersecurity—an area currently underrepresented in holistic academic discussions. |  |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | The title of the manuscript is largely suitable and informative. It accurately reflects the core dual focus of the paper: AI-driven molecule design and cybersecurity in healthcare. However, it could be made more concise and impactful. A suggested alternative title could be: "Integrating AI-Based Therapeutic Design and Cloud Cybersecurity for Rare Genetic Diseases: A Systematic Review". This revised title maintains the scientific breadth while enhancing clarity and conciseness. |  |
| **Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.** | The abstract is comprehensive and well-structured. It successfully encapsulates the background, objectives, methodology, results, and conclusions. It highlights the scope of the review, the methodologies used (e.g., PRISMA), and key findings regarding both AI’s diagnostic potential and associated cybersecurity vulnerabilities. However, a minor suggestion would be to briefly state the types of AI techniques reviewed (e.g., facial recognition, molecular modeling, genomic data analysis) to give readers a quick overview of technological approaches. Additionally, while the cybersecurity challenges are mentioned, the abstract could benefit from a more explicit emphasis on the ethical implications, which are extensively covered in the manuscript. |  |
| **Is the manuscript scientifically, correct? Please write here.** | The manuscript appears to be scientifically accurate and methodologically sound. It uses an established framework (PRISMA) to guide the review process, includes a substantial and recent body of literature (208 articles between 2015–2025), and presents data with appropriate interpretation. The discussions around AI methodologies, cybersecurity risks (e.g., data poisoning, model theft), and mitigation strategies are technically valid. Ethical concerns such as GDPR compliance, data ownership, and biometric misuse are critically examined, reflecting an interdisciplinary approach. However, while experimental validation of AI systems is mentioned as a limitation, more emphasis on empirical performance metrics and real-world clinical applications would enhance the scientific robustness. |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.** | The references are sufficient, relevant, and include a broad range of recent publications up to 2025. The manuscript demonstrates familiarity with contemporary studies in AI, genetic screening, and cybersecurity. Key publications from peer-reviewed journals in genetics, AI, and bioethics are appropriately cited. However, the review could be strengthened by including more clinical validation studies or meta-analyses on AI-driven diagnostics in rare disease populations. Adding systematic evaluations from high-impact journals such as Nature Medicine, The Lancet Digital Health, or JAMA would further support the review's credibility. |  |
| **Is the language/English quality of the article suitable for scholarly communications?** | The English language and academic tone are generally suitable for scholarly communication. The manuscript employs appropriate scientific vocabulary and maintains clarity and coherence throughout. Nevertheless, there are instances of grammatical inconsistency, redundancy (e.g., repeated descriptions of PRISMA process), and typographical issues (such as inconsistent spacing or sentence fragments). A professional language edit is recommended to polish the manuscript and enhance overall readability. |  |
| **Optional/General** comments | This manuscript is timely and thematically rich, addressing the growing intersection of AI applications in medicine and the emerging necessity of cybersecurity frameworks in healthcare. Its strengths lie in its interdisciplinary scope, thorough literature analysis, and the thoughtful integration of ethical and regulatory perspectives. However, several areas could be improved: the figures and tables, while informative, require better formatting and clearer labeling; the conclusion should offer more actionable insights for practitioners and policymakers; and the results section might benefit from summarizing statistical trends or thematic synthesis more explicitly. Enhancing the visual data and incorporating more technical depth regarding AI algorithm performance would elevate the scholarly impact. |  |

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| **PART 2:** | | |
|  | **Reviewer’s comment** | **Author’s Feedback** (It is mandatory that authors should write his/her feedback here) |
| **Are there ethical issues in this manuscript?** | *(If yes, Kindly please write down the ethical issues here in details)* |  |

**Reviewer details:**

**Parankush Koul, Illinois Institute of Technology, United States of America**