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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. | We sincerely appreciate the reviewer's recognition of our manuscript's significance. The reviewer correctly identifies that this work addresses a critical gap in the literature by bridging AI-driven therapeutic development, rare genetic diseases, and cybersecurity frameworks. We are encouraged by the acknowledgment that our integrative approach contributes to underrepresented holistic academic discussions. This validation reinforces our belief that the manuscript will serve as a valuable resource for researchers, clinicians, and policymakers working at the intersection of biomedical AI, ethics, and data security. |
| **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. | We thank the reviewer for the constructive feedback on the title. We agree that the suggested alternative "Integrating AI-Based Therapeutic Design and Cloud Cybersecurity for Rare Genetic Diseases: A Systematic Review" is more concise and impactful while maintaining scientific breadth. We have revised the title accordingly to enhance clarity and better reflect the manuscript's dual focus. |
| **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. | We appreciate the reviewer's positive assessment of our abstract structure. Following the suggestion, we have revised the abstract to briefly mention the specific AI techniques reviewed (facial recognition algorithms, molecular modeling platforms, and genomic data analysis tools). Additionally, we have strengthened the emphasis on ethical implications, particularly regarding patient consent, data ownership, and biometric privacy concerns, to better reflect the extensive ethical coverage within 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. | We are grateful for the reviewer's confirmation of our scientific accuracy and methodological soundness. The reviewer's recognition of our PRISMA framework application and interdisciplinary approach validates our research methodology. Addressing the suggestion for enhanced empirical focus, we have expanded our discussion of AI performance metrics and included additional real-world clinical application examples, particularly from pilot studies in rare disease diagnosis. We have also strengthened the limitations section to more explicitly address the need for larger-scale clinical validation studies |
| **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. | We thank the reviewer for acknowledging the sufficiency and relevance of our references. Following the recommendation, we have incorporated additional clinical validation studies and meta-analyses from high-impact journals including Nature Medicine, The Lancet Digital Health, and JAMA Network Open. These additions particularly strengthen our sections on AI diagnostic accuracy and clinical implementation challenges in rare disease populations. |
| **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. | We acknowledge the reviewer's assessment of our academic tone and scientific vocabulary. We have conducted a comprehensive professional language edit to address grammatical inconsistencies, eliminate redundancy (particularly in PRISMA process descriptions), and correct typographical issues. The manuscript has been thoroughly proofread to enhance overall readability and maintain consistent scholarly communication standards. |
| **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. | We deeply appreciate the reviewer's comprehensive feedback highlighting both strengths and areas for improvement. In response; **Figures and Tables**: All visual elements have been reformatted with clearer labeling, improved spacing, and enhanced readability, **Conclusion**: We have expanded the conclusion to provide more actionable insights for practitioners and policymakers, including specific recommendations for implementation frameworks, **Results Section**: Statistical trends and thematic synthesis have been made more explicit through enhanced data summarization and clearer categorical organization, **Technical Depth**: We have incorporated additional technical details regarding AI algorithm performance metrics, including sensitivity, specificity, and computational efficiency comparisons, **Visual Data Enhancement**: Tables and figures now include more comprehensive data presentation with improved statistical summaries and clearer trend visualization |

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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)* |  |