A New Horizon of Biochemistry and Laboratory Medicine with Chat GPT

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Artificial intelligence (AI) is capable to simulate human intelligent behavior and critical thinking using computer and machine technology. At present, AI is transforming many fields of societies, including the medical field. One of the most recent topics in AI- based medicine is the Chat Generative Pre-trained Transformer, "ChatGPT" in brief, for generating human like text, which gives answers to queries in natural language processing. It led the world to the transformative potential of artificial intelligence (AI) with rare unexpected creativity. This is such a generative AI, and would be so helpful for building up knowledge and providing interpretations. It is part of the family of generative pre-training transformer (GPT) models that can engage with people to answer questions and uses natural language processing models. It is the largest publicly available language models in current state.

It is also expected to revolutionize the fields of biochemistry and laboratory medicine. On the other hand, the studies in the field have just begun. A study has been recently reported from the biochemical specialists of Indian institute (Ghosh A, 2023). That study examined the responses to biochemistry questions that require higher-order

Thinking. In total, 200 questions, which were selected from the question bank for the competency modules of a valid curriculum, were used for that study. When the specialists evaluated the responses on a 5-point scale, the score was mostly 4 out of 5 points. It implicates that ChatGPT has the potential to resolve questions on biochemistry.

Another study has been recently performed by the European Federation of Clinical Chemistry and Laboratory Medicine Working Group on Artificial Intelligence (Cadamuro J, 2023). That study examined the ChatGPT-v4.0's interpretations of laboratory reports based on the popular test items. The specialists evaluated the ChatGPT's interpretations of 10 cases the reference intervals and practical units of test items,as

well as the patient's age and gender attributes. The evaluation of interpretations was relatively high in terms of relevance, correctness, and safety, but not helpfulness. In some cases, there were incomplete interpretations of test items. Interpretation in considering therapy (e.g., drug dosing) appeared to be difficult. The authors have concluded that presently, ChatGPT may interpret laboratory reports on a test-by-test basis, but not the full picture. In research purposes, it has shown the importance of analyzing huge amounts of available literature beyond the scope of a single individual's expertise which helped to reduce the time, energy, and resources spent on experiments that may have a higher probability to obtain futile results (Cahan P, 2023).

Given the small number of studies, the value of ChatGPT is yet to be determined in the fields of biochemistry and laboratory medicine. However, the development of AI-related medicine continues and its apparent potential advantages cannot be denied including expediting research workflows by aiding in data management, candidate selection in trials, and supporting overall research activities. Thus, it can prove helpful in enhancing the productivity of research work. Extending further, the ChatGPT can potentiate the efficiency of academic publishing while helping to review the manuscripts and their editing. Inpatient care, its potential cannot be denied for patient education and assistance in clinical decision-making.

Further, ethical considerations are soon necessary. It cannot be neglected that the speed of technology evolution and adoption requires paying close attention to any medical, ethical, legal, and reputational risks. Human specialists-ChatGPT collaboration will become even more important for the future of biochemistry and laboratory medicine. In its current state, it lacks the capability to offer comprehensive diagnosis while giving critical thinking and originality which is importantly required in healthcare while removing potential biases involved. Thus, it still seems a distant approach while replacing the inherent human qualities and reasoning that are important to medical practice. Thus, instead of implementing the technology hastily; it should be inclined towards its careful introduction and to open a debate about its risks and benefits.

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