عنوان مقاله:

The Future and Application of Artificial Intelligence in Toxicology

محل انتشار:

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خلاصه مقاله:

Background: Toxicology is a critical field that is of significant importance to various industries, including pharmaceuticals, environmental protection, and consumer product safety. It's a multidisciplinary science that often involves time-consuming and expensive toxicity tests, which can delay the development of new products and pose significant risks to public health and the environment. Therefore, there is an ever-growing demand for faster and more efficient toxicity evaluations. Artificial Intelligence (AI) has emerged as a promising solution to address these pressing challenges. By enabling the development of machine learning models that can analyze vast amounts of data. This review article focuses on the potential impact of AI in toxicology and its applications in different areas, such as predictive toxicology, development of toxicity screening assays, assessment of chemical mixtures, interpretation of toxicological data, and forensic toxicology. Methods: This review was done a comprehensive literature search across multiple scientific databases. Searches were conducted in Medline/PubMed, Google Scholar and Web of Science to identify relevant publications. The search terms used included combinations of "artificial intelligence", "toxicology", "toxicity", and related keywords. The final set of articles selected provided a comprehensive overview of the current state of research on the applications of AI techniques in toxicology and chemical risk assessment. Results: The review highlighted a growing body of research exploring the potential role of AI in accelerating and enhancing various aspects of toxicity assessment and chemical risk evaluation. The reviewed studies demonstrate how AI models can be trained on large datasets of chemical structures, in vitro assay results, and toxicological outcomes to predict the toxicity of novel compounds and other fields such as forensic toxicology. On the other hand, legal and ethical aspects of using AI was investigated. Conclusion: Overall, the findings of this review highlight this fact that AI can enable faster, more cost-effective, and more accurate toxicity assessments and ultimately leading to improved chemical safety and risk management practices. potential role of AI in accelerating and enhancing various aspects of toxicity assessment and chemical risk evaluation. The reviewed studies demonstrate how AI models can be trained on large datasets of chemical structures, ...in vitro assay results, and toxicological outcomes to predict the toxicity of novel compounds and other fields such as forensic toxicology

کلمات کلیدی:

toxicology, Artificial intelligence, Risk Assessment, Predictive Toxicology, Legal