ARTIFICIAL INTELLIGENCE IN DRUG DEVELOPMENT, CLINICAL TRIALS, AND HEALTHCARE

Vangelis Karalis[1], Aleksandra Catić-Đorđević[2]

The use of artificial intelligence (AI) in drug development, clinical trials, and clinical practice represents a transformative advancement in healthcare. AI technologies offer unprecedented capabilities to analyze vast datasets, identify patterns, and generate actionable insights, thereby revolutionizing various aspects of the healthcare ecosystem. This review aims to offer a thorough overview of current research on AI applications in healthcare. In drug development, AI-driven approaches rationalize the process of identifying potential therapeutic compounds, accelerating the route from discovery to market approval. Within clinical trials, AI-powered analytics optimize trial design, reduce sample size, patient recruitment, and data analysis, increasing statistical power and efficiency. Moreover, in clinical practice AI applications empower healthcare providers with decision support systems, personalized treatment recommendations, and predictive analytics, leading to more effective and personalized patient care. While challenges such as ethical considerations and regulatory frameworks remain, the potential benefits of AI in driving medical innovation and improving patient outcomes are substantial, underlining the importance of continued research, collaboration, and responsible application of AI in healthcare.