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Oncology: AI, Genomics, and Targeted Therapies

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AI and Genomics in Drug Discovery Accelerating Cancer Treatment Development

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Abstract:

Traditional methods in drug discovery are often slow, costly, and require years of experimentation. Artificial intelligence (AI) especially Deep Reinforcement Learning (DRL), offers a data driven approach that can accelerate this process by learning effective strategies directly from complex biological data. DRL's ability to adapt and improve decision making in dynamic environments makes it suitable for addressing challenges like drug resistance caused by tumour mutations. Therefore, the research question this study focuses on is: "How can deep reinforcement learning be used to generate novel drug like molecules targeting EGFR for effective personalized cancer treatment?". In this study we are targeting Epidermal Growth Factor Receptor (EGFR). EGFR is a key cancer target in lung, breast, and colorectal cancers.