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Combination therapies in drug repurposing: Personalized approaches to combatting leukaemia and multiple myeloma

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Despite advances in cancer research, treating malignancies remains challenging due to issues like drug resistance, disease heterogeneity, and the limited efficacy of current therapies, particularly in relapsed or refractory cases. In recent years, several drugs originally approved for non-cancer indications have shown potential in cancer treatment, demonstrating anti-proliferative, anti-metastatic, and immunomodulatory effects. Drug repurposing has shown immense promise due to well-established safety profiles and mechanisms of action of the compounds. However, the implementation is fraught with clinical, logistical, regulatory, and ethical challenges, especially in diseases such as leukaemia and multiple myeloma. This chapter examines the treatment challenges in leukaemia and multiple myeloma, focusing on the role of drug repurposing in addressing therapeutic resistance and disease variability. It highlights the potential of personalized, tailored combination therapies, using repurposed drug components, to offer more effective, targeted, and cost-efficient treatment strategies, overcoming resistance and improving patient outcomes.