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Large placebo responses can be an important factor contributing to the failure of clinical trials. However, over the past decade, our understanding of the mechanisms mediating the placebo effect has grown substantially. The implications of this knowledge for drug development and disease treatment are discussed in a Perspective this month, in which Enck and colleagues present strategies to modulate and personalize placebo responses to help achieve the optimal outcomes in different contexts. Stromal cells and the tumour microenvironment can affect drug sensitivity and therefore influence the successful clinical translation of novel anticancer treatments from preclinical development. In their Review, Mitsiades and colleagues discuss the impact of tumour–stromal interactions on tumour cell signalling, survival, proliferation and drug sensitivity, and assess the challenges and opportunities for drug discovery. Recent advances in the understanding of the pathogenesis underlying various lymphomas have revealed B cell receptor (BCR) signalling as a central oncogenic pathway that promotes growth and survival. Young and Staudt provide an overview of BCR signalling in normal lymphocytes and discuss how this may be altered in lymphoid malignancies to result in chronic active or tonic BCR signalling. BCR pathway-targeted small molecules that are currently in clinical trials are also assessed. Finally, in their Perspective, Kenakin and Christopoulos discuss the phenomenon of signalling bias with regard to seven-transmembrane receptors, whereby agonists stabilize unique active states to create a signal that is 'biased' towards specific cellular pathways. They present examples of biased receptor activation and methods for quantification, and highlight the therapeutic implications and impact on the drug discovery process.

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