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Immunotherapy: Strategies for expanding its role to treat all major tumor sites

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Immunotherapy is widely regarded to have the ability to transform the treatment of cancer, not least because it avoids the many limitations of chemotherapy and radiotherapy. As immunotherapy effectively harnesses the immune system, in principle it should be able to treat a broad range of tumor types independent of the underlying histology or driver mutations. However, to date immunotherapy has only demonstrated efficacy in a select group of cancers and usually in a minority of patients with those cancers, limiting its use as a treatment. This can be partly attributed to additional immunosuppressive mechanisms in the tumor microenvironment that help promote and maintain a state of T cell exhaustion. As such, numerous strategies are being employed to combat these evasive mechanisms and expand the role of immunotherapy to treat all major cancers. In particular, the exploration of combinatory immunotherapies is a promising area of research, and includes the combination of immune checkpoint inhibitors with cytotoxic therapies, cancer vaccines and monoclonal antibodies against other co-inhibitory and co-stimulatory receptors. Strategies to improve the homing, extravasation and survival of CAR-T cells in the tumor microenvironment are also being investigated. Furthermore, the development of immunotherapies targeted to one or multiple neoantigens unique to a specific tumor may act to enhance anti-tumor immunity, as well as reduce immune-related adverse events (irAEs). As immunotherapy evolves to become a mainstay treatment for cancer, it is imperative that optimum treatment regimens that maximize bioavailability and efficacy, whilst limiting toxicity, are developed. Foremost, appropriate biomarkers must be identified, in order to help tailor combinatory immunotherapies to the individual patient and hence pave the way to a new era of personalized medicine.

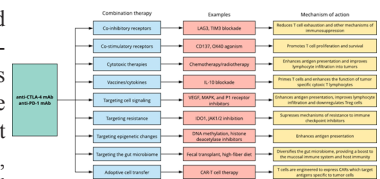


Figure 1: Combinatory immunotherapy approaches and their synergistic mechanisms of action

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