Novel tools to assist neoepitope targeting in personalized cancer immunotherapy

Current cancer immunotherapy approaches utilize the remarkable surveillance capacity of the human immune system, which is capable of recognizing and eliminating cancer cells based on identification of tumor-associated antigens arising as a consequence of the transformation process. Among these, mutational-derived neoepitopes have proved to be powerful targets for tumor elimination and mutational load has been shown to correlate with the clinical response to treatment with checkpoint inhibitors in many different tumor types. This suggests a crucial role for neoepitope recognition in T-cell-mediated tumor eradication. Consequently, strategies to further boost neoepitope recognition, through vaccination or adoptive cell transfer, has received substantial interest. Although such strategies have enormous potential, there are also considerable challenges associated with these approaches. In the present review, we will focus on how novel technological developments can facilitate and improve feasibility and efficacy in neoepitope targeting.

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