Category winner

Gabriele Casirati

Category: Molecular Medicine

Essay title: *To target, to escape, perchance to cure – Borrowing a page from cancer's playbook, humans learn to evade our own therapies*

Biography

Gabriele Casirati received his medicine degree from Università degli Studi di Milano and completed his hematology residency at Università Vita-Salute San Raffaele. In 2020 he joined Dana-Farber Cancer Institute as a research fellow and, in 2023, he received a PhD in Molecular and Translational Medicine from Università Milano-Bicocca. He is currently a senior postdoctoral fellow at Boston Children's Hospital. His research focuses on immune engineering strategies to enhance targeted immunotherapies for hematological malignancies and hematopoietic stem cell transplantation.

Abstract

Targeted cellular therapies hold tremendous potential to revolutionize cancer treatment, as demonstrated by the recent success of several immunotherapeutic agents. Despite this, harnessing the "different from normal" is not always possible, as several tumors do not bear cancer-restricted features that may be safely amenable to elimination without incurring on-target/off-tumor toxicity. In this essay, we describe the development of epitope editing, a gene-editing strategy to enable targeted immunotherapies in the context of hematological malignancies, by endowing healthy stem cells with selective resistance to chimeric antigen receptor T cells or monoclonal antibodies. We anticipate that this approach will provide opportunities to treat difficult-to-treat tumors, enable safer, non-genotoxic conditioning for bone marrow transplantation and broaden the therapeutic index of several pharmacological agents.