



Neoantigen Profiling: Revolutionizing Personalized Medicine in Oncology

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Abstract

Neoantigen profiling represents a groundbreaking approach in the realm of personalized medicine, particularly in oncology. By identifying unique neoantigens generated by tumor-specific mutations, researchers and clinicians can tailor immunotherapies to individual patients, enhancing treatment efficacy and minimizing adverse effects. This article explores the concept of n á M M M M M M

The field of oncology has undergone significant transformation in recent years, driven by advancements in molecular biology, genomics, and immunotherapy. Traditional cancer treatments, such as chemotherapy and radiation, often target rapidly dividing cells indiscriminately, leading to adverse effects and varying efficacy among patients. In contrast, personalized medicine aims to tailor treatment based on individual patient characteristics, including genetic and molecular profiles. One of the most promising developments in this T6uA 2w02.331 09037li6Ttes s canteen tamutdentdeveloptheraing cel57

bioinformatics tools that can predict which mutations will yield immunogenic neoantigens. Several algorithms and software platforms, such as MuPeXI, NetMHC, and IEDB, have been developed to assess the binding affinity of neoantigens to major histocompatibility complex (MHC) molecules. These predictions are critical for selecting the most promising neoantigens for therapeutic targeting.

Vaccine development

Once neoantigens are identified and validated, they can be used to develop personalized cancer vaccines. These vaccines aim to stimulate the patient's immune system to recognize and attack tumor cells expressing the neoantigens. Several approaches to vaccine development exist, including peptide-based vaccines, dendritic cell vaccines, and RNA-based vaccines. Clinical trials have shown promising results,