

Exploring Neoantigens to Increase Immunogenicity in Treating Pancreatic Cancer

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Pancreatic ductal adenocarcinoma (PDAC) is a form of aggressive pancreatic cancer with a dire prognosis. Resection of the tumor is the only modality of complete cure but even despite that chances of recurrence is extremely elevated. This research examines the potential and recent advancements of finding the antigens responsible for cancer development. Search for identifying such neoantigens has led to the development of mRNA vaccine. Some antigenic genes that have been identified include ADAM 9, MET, TMOD3, TPX2 and ferroptosis related genes. When these are incorporated into mRNA vaccines, they can produce an immune response rich in cytotoxic T cells that mainly attack the cancer cells, preventing harm to normal cells. Based on the response that can be developed by targeting a gene and attributing the effects of that particular gene on the oncogenic potential, many subtypes can be developed. These subtypes then form the inclusion or exclusion criteria to the use of a particular type of vaccine generated, which was how Autogene cevumeran was created. Autogene cevumeran (BNT122) is the first mRNA vaccine which was created for the treatment of PDAC, it contains 20 neoantigens that was selected based on the body's capability to stimulate an effective immune response. The results revealed that patients who responded to the vaccine exhibited a longer recurrence-free survival than non-responders at an early median follow-up of 15 months, along with lowered serum levels of CA 19-9 marker and reversal of micrometastasis all of which suggests that vaccine-induced neoantigen-specific immunity may be associated with improved outcomes in PDAC.