Docket #: S22-437

Hypoallogenic-Immunogenic Pluripotent Stem Cells as an Anti-cancer Vaccine

Stanford researchers in the Wu Lab have developed hypoallergenic and immunogenic induced pluripotent stem cells that could be used as a cancer treatment or prophylactic. This stem cell technology provides tumor-associated antigens (TAAs) and tumor-specific antigens (TSAs) to the immune system that activate both specific cellular immunity and humoral immune responses to prevent tumor growth and/or eradicate tumor cells. As this invention was genetically engineered to be hypoallergenic and also immunogenic, it only provokes anti-cancer immunity without inducing any undesired graft-verse-host diseases. Besides, unlike other cancer immunotherapies such as checkpoint inhibitor-based immunotherapies or chimeric antigen receptor (CAR) T cells, hypoallergenic-immunogenic based vaccine does not cause any immune related adverse events (irAEs) or organ-specific inflammatory side effects. This invention paves the way for the production of an allogeneic iPSC therapy to treat or prevent cancer.

In addition, common drawbacks of individualized cell therapy include manufacturing time, lack of Good Manufacturing Practice (GMP) conditions, and high cost. This invention overcomes these challenges, a potential "off-the-shelf" stem cell therapy that could be a better GMP standardized vaccine and which has the advantages of being cost-efficient and ready-to-use for cancer patients. Such an off-the-shelf vaccine can potentially be produced in bulk as a universal vaccine and be used to treat a broader range of cancer patients.

Stage of Development:
Pre-clinical

Applications

- Cancer vaccine for high-risk groups
- Combination therapy with other cancer therapies

Advantages

- Hypoallergenic and immunogenic properties prevent graft-versus-host disease
- More cost effective and readily available compared to autologous-based anti-cancer vaccines
- Quality-controlled and regulated

Patents

- Published Application: WO2024107420

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