Therapeutics & Vaccines

SIRPα Inhibited Macrophages and Neutrophils and Uses Thereof

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The Invention

UW-Madison researchers have developed methods for generating SIRPα-KO macrophages with superior anti-tumor activity, and SIRPα-knockout neutrophils with superior anti-bacterial and anti-tumor activity for therapeutic purposes for therapeutic purposes. They knocked out the SIRPα gene from human pluripotent stem cells (hPSCs) using CRISPR/Cas9 technology, and then differentiated the SIRPα-KO cell lines to generate macrophages or neutrophils in serum- and feeder-free conditions. When compared with wild type macrophages, SIRPα-KO macrophages demonstrated superior cytotoxic and phagocytic effects on CD47-expressing tumor cells. The inventors characterized the morphology and cell surface markers of the resulting SIRPα-KO neutrophils and found that SIRPα-KO neutrophils demonstrated superior motility, with improved phagocytic activity of bacterial particles and cytotoxicity against tumor cells, when compared with wild type neutrophils. Overall, this invention provides a method for generating SIRPα- knockout macrophages and SIRPα-knockout neutrophils with superior activities for therapeutic purposes.

Additional Information

For More Information About the Inventors

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Tech Fields

- Pluripotent Stem Cells : Differentiation
- Therapeutics & Vaccines : Anti-infectives (antibacterials, antifungals, antivirals)
- Therapeutics & Vaccines : Biologics

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