

## **Carmine Therapeutics teams up with Takeda for non-viral gene therapies**

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### **Carmine Therapeutics and Takeda Collaborate to Discover and Develop Rare Disease Gene Therapies Using Novel Red Blood Cell Extracellular Vesicles Platform**

Singapore based startup Carmine Therapeutics has announced that it has signed a research collaboration agreement with Japanese firm Takeda Pharmaceutical Company Limited to discover, develop and commercialize transformative non-viral gene therapies for two rare disease targets using Carmine's REGENT(TM) technology, based on red blood cell extracellular vesicles. In addition, Takeda has committed a \$5M convertible loan in support of the development of Carmine's novel REGENT™ platform.

Under the terms of the agreement, Carmine will receive an upfront payment, research funding support, and is eligible for over \$900M in total milestone payments plus tiered royalties.

Takeda has an option to license the programs following the completion of pre-clinical proof of concept studies and would be responsible for clinical development and commercialization.

Carmin Therapeutics is pioneering a novel class of therapeutics based on its REGENT(TM) technology which leverages red blood cell extracellular vesicles (RBCEVs), first published in Nature Communications in 2018.

An initial focus is non-viral gene therapies. Compared to adeno-associated virus (AAV)-based gene therapy, RBCEV-based gene therapy has the potential for repeat dosing, a significantly larger transgene payload capacity in excess of 11KB, and enhanced bio-distribution in selected tissues through RBCEV surface modification.