Docket #: S18-305

Therapeutic targeting of the Platelet-Derived Growth Factor (PDGF) signaling pathway in dilated cardiomyopathy

Researchers at Stanford have developed a novel therapeutic approach for dilated cardiomyopathy (DCM). DCM is characterized by left ventricular enlargement and reduced systolic function. In many cases, the underlying cause remains unknown, but pathogenic variants in the LMNA gene (lamin A/C) are a key contributor. Patients with LMNA-related DCM are at high risk of sudden cardiac arrest due to prevalent arrhythmias, making early intervention critical.

Using patient-specific induced pluripotent stem cell-derived cardiomyocytes (iPSC-CMs), Stanford scientists discovered that dysregulation of the platelet-derived growth factor (PDGF) signaling pathway is a major driver of arrhythmias in DCM. By inhibiting this pathway, they successfully restored normal cardiac rhythms in mutant iPSC-CMs. Here, the inventors provide a method of treatment using tyrosine kinase inhibitors that successfully mitigated these arrhythmias, offering a promising strategy for managing this life-threatening condition. This technology offers a new therapeutic strategy to treat DCM and has the potential to improve the care of patients with LMNA-dependent DCM.

Stage of Development
Research - in vitro

Applications

- Treatment and prevention of LMNA-related dilated cardiomyopathy.

Advantages

- Reduces risk of cardiac arrest and sudden death.
- Non-invasive, systemic treatment.
- Potential for broader cardiac applications: may extend to other cardiovascular conditions associated with PDGF pathway dysregulation, including fibrotic and arrhythmogenic heart diseases.

Publications

- Lee, J., Termglinchan, V., Diecke, S., Itzhaki, I., Lam, C. K., Garg, P., . . . Wu, J. C. Activation of PDGF pathway links LMNA mutation to dilated cardiomyopathy. *Nature* August 2019.

Patents

- Published Application: WO2021145871
- Published Application: 20230032239

Innovators

- Vittavat Termglinchan
- Ioannis Karakikes
- Joseph Ching-Ming Wu
- Jaecheol Lee
- Sebastian Diecke

Licensing Contact

Tariq Arif

Senior Associate Director, Life Sciences

Email