LEVITAS BIO

# LeviCell™ Demonstrates Marker-Free Enrichment of Cardiomyocytes

## Introduction

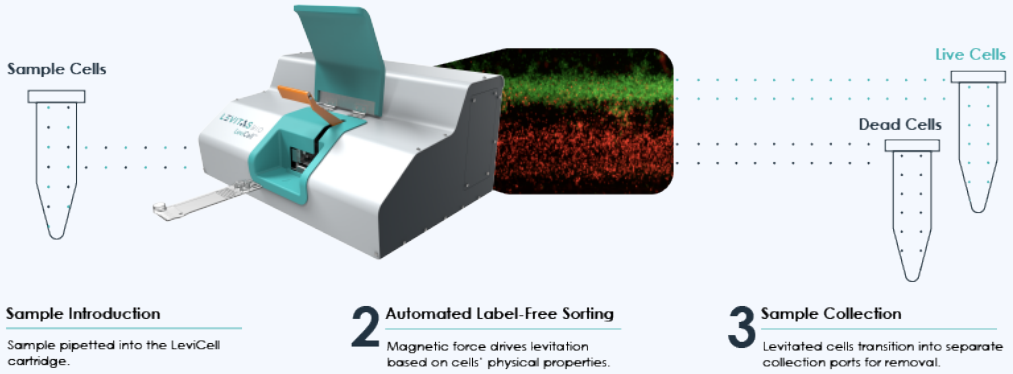
With heart disease being one of the leading causes of death worldwide, deeper insight into the possible roles that cardiomyocytes play in the regeneration and repair of the heart is key to developing life-saving therapies. While surgical intervention (bypass, catheter, assist devices) continue to be the most widely implemented treatment, the nature of cardiovascular disease inevitably leads to heart failure – and subsequent need for a heart transplant.

Since the demand for heart transplantation far exceeds the available supply, cell-based cardiac repair therapies are being aggressively pursued as a more pragmatic, cost-effective, and low-risk option. However, despite the decades-long studies performed on cardiomyocytes, this cell type remains one of the more challenging to isolate. The LeviCell offers a real and immediate solution.

## Method

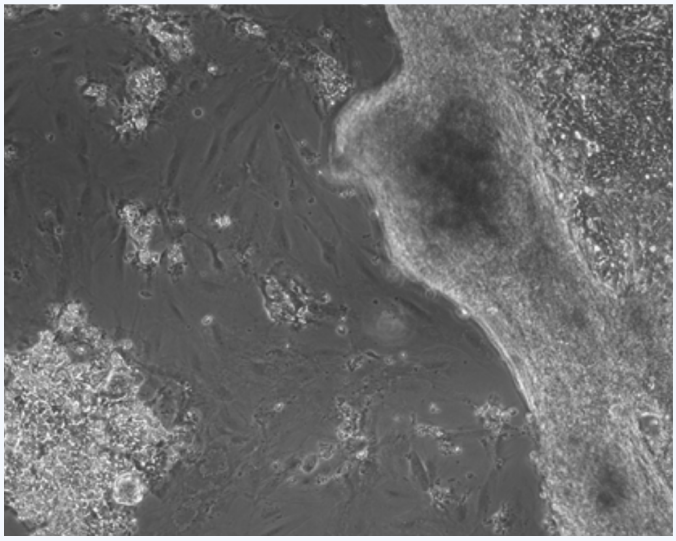
Through its innovative levitation technology, the LeviCell harnesses unique properties of cardiomyocytes to isolate them from fibroblasts and enrich for differentiated live cardiomyocytes when working with stem cells. Since the LeviCell does not require dyes or antibodies, gene expression is not activated and population representation is preserved.

Additionally, the LeviCell platform's 20-minute, three-step process efficiently separates cells without the need for repeated manual manipulation, enables purification of viable cardiomyocytes even with low starting numbers, and easily separates the target cell type from debris-filled samples.

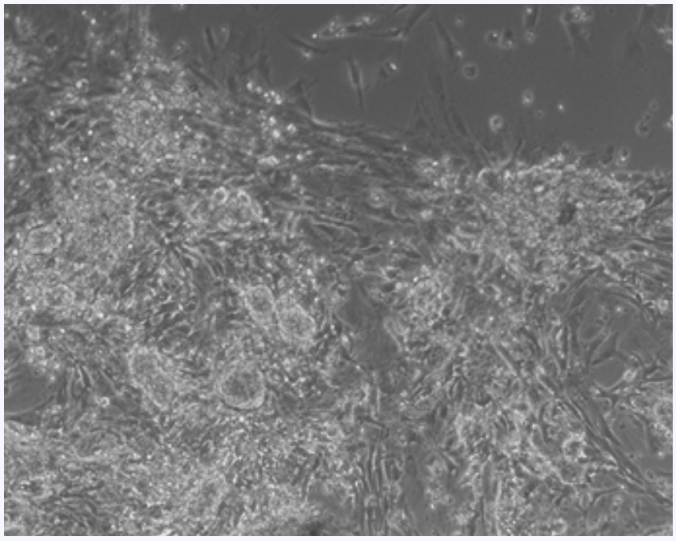


## Results

Induced pluripotent stem cells (iPSCs) were differentiated into cardiomyocytes and metabolically starved before resuspending in levitation agent. Cardiomyocytes were enriched from the undifferentiated iPSCs and fibroblasts by processing with the LeviCell. Outputs were cultured in 6 well plates for 3-5 days to determine phenotype and viability.



*Pre-LeviCell Enriched*



*Post-LeviCell Enriched*

## Conclusion

In recent years, cardiomyocyte research has contributed to a greater understanding of the pathogenesis of cardiovascular disease and served as a foundation for pioneering therapeutic alternatives to current surgical interventions. Despite the advancements, cardiomyocytes remain one of the most challenging cell types to isolate and enrich. It is in this arena that the LeviCell can play an indispensable role.

Cardiomyocytes are known to be a sensitive cell type, current marker-based selection methods have been ineffective for the enrichment of viable cells. The LeviCell platform's marker-free technology has repeatedly demonstrated the capability to successfully enrich differentiated cardiomyocytes without activating the cells or affecting population representation. This presents significant potential for furthering the development of novel therapies for cardiovascular disease.

1455 Adams Drive
Menlo Park, CA 94025
contact@levitasbio.com



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