



Miltenyi Biotec

Differentiation and cultivation of hPSC-derived cardiomyocytes



Simplify your hPSC differentiation

Directed differentiation of specific lineages from human Pluripotent Stem Cells (hPSCs) is a major tool for development of disease models, drug screening platforms, and cellular therapies. For each of these applications, it is pivotal to have a consistent, timesaving, and reliable hPSC differentiation.

For this reason, we developed a specifically tailored differentiation medium. The StemMACS™ CardioDiff Kit XF enables robust and standardized cardiac differentiation, without the need for media adjustments.

Fast and easy protocol

The StemMACS™ CardioDiff Kit XF is a complete cell culture system optimized for fast and efficient differentiation of hPSCs into cardiomyocytes. The kit is composed of three xeno-free media (Mesoderm Induction Medium, Cardiac Induction Medium and Cardiac Cultivation Medium) that progressively restrict the cellular fate and promote differentiation into cardiomyocytes within just 8 days of culture. If required, hPSC-derived cardiomyocytes can be further cultivated in StemMACS Cardiac Cultivation Medium XF. This easy to use kit does not require addition of supplementary factors, allowing you to maintain a strong experiment-to-experiment consistency.

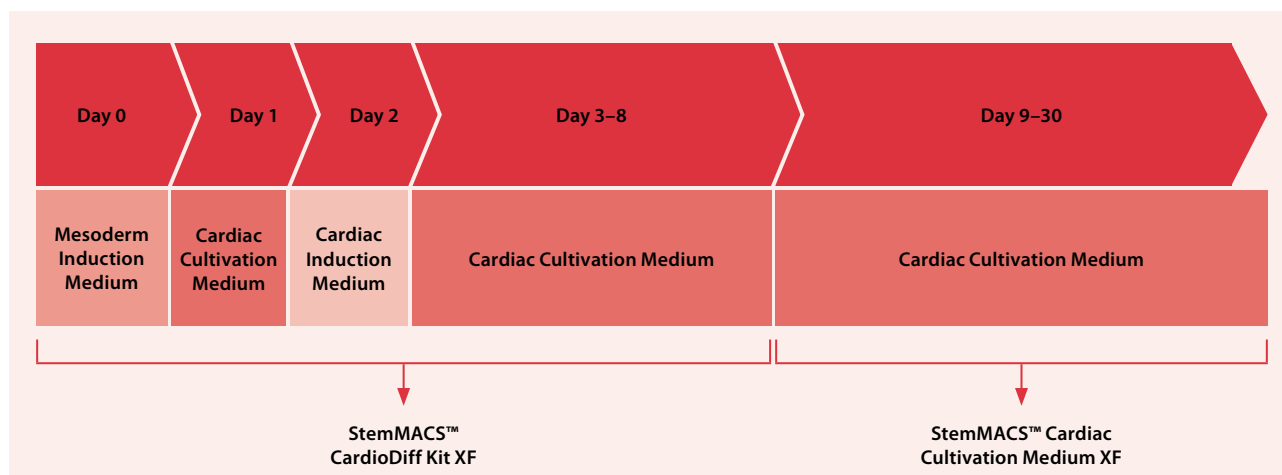


Figure 1: Timeline of hPSC-derived cardiomyocyte differentiation and cultivation. Cardiac differentiation of hPSCs is induced stepwise by using three different media contained in StemMACS CardioDiff Kit XF. Specific fate-restricting media (Mesoderm Induction Medium, Cardiac Induction Medium and Cardiac Cultivation Medium) are obtained just by mixing the appropriate supplement with StemMACS CardioDiff Basal Medium XF. After seeding a suitable amount of hPSC, differentiation is commenced by adding the correct medium each day. If a longer cultivation of PSC-derived cardiomyocyte is required, differentiated cells can be maintained in StemMACS Cardiac Cultivation Medium XF.

Efficient generation of hPSC-derived cardiomyocytes

hPSC-derived cardiomyocytes obtained with StemMACS™ CardioDiff Kit XF express characteristic markers and show typical morphology. The kit ensures high differentiation efficiency and experiment-to-experiment consistency.

LEARN MORE 

Check out our workflow: Step-by-step guidance through the differentiation process, isolation of the resulting cardiomyocytes and their analysis using flow cytometry or immunofluorescence microscopy.

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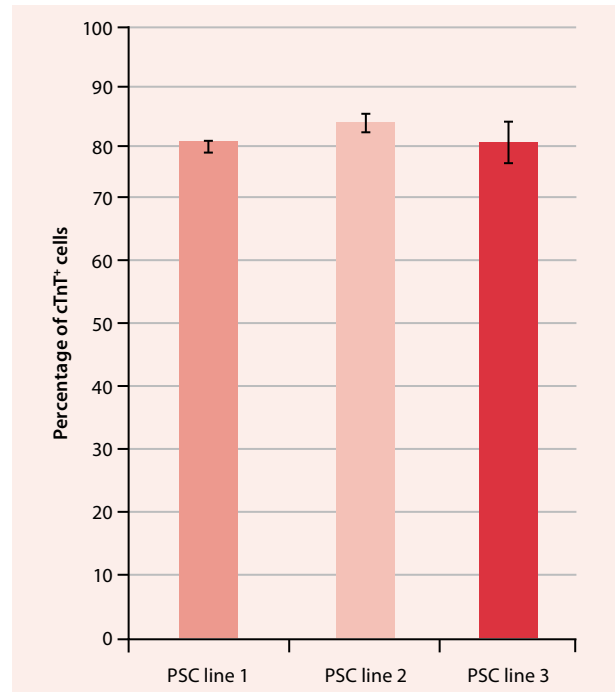


Figure 2: StemMACS CardioDiff Kit XF yields to high differentiation efficiencies as measured by flow cytometry analysis of cardiac troponin T (cTnT) in different hPSC lines, with good experiment-to-experiment consistency. n ≥ 3; means ± SD.

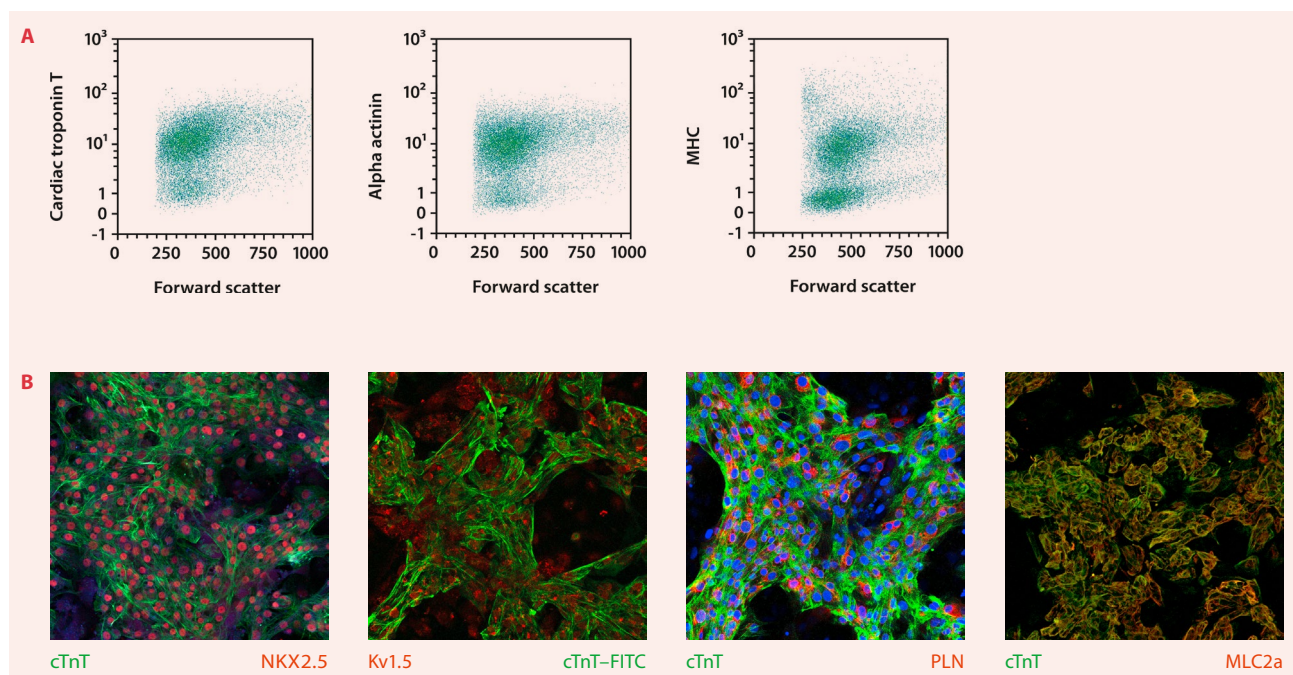


Figure 3: (A) Characterization by flow cytometry and immunofluorescence staining of cardiomyocytes generated with StemMACS CardioDiff Kit XF shows the expression of typical cardiomyocytes markers (Cardiac troponin T, alpha actinin, MHC). (B) Immunofluorescence staining confirms expression of cTnT, Nkx-2.5, Kv1.5 and phospholamban (PLN). The expression of Kv1.5 and PLN implies the presence of cardiomyocytes with electrical properties and Ca²⁺ handling machinery.

Product	Order no.
Anti- α -Actinin (Sarcomeric)-FITC, human, mouse, rat	130-124-060
Anti-Cardiac Troponin T-FITC, human, mouse, rat	130-119-674
Anti-MLC2a-APC, human, mouse, rat	130-118-674
Anti-MLC2v-PE, human, mouse, rat	130-119-680
Anti-Myosin Heavy Chain-APC, human, mouse, rat	130-122-924
Multi Tissue Dissociation Kit 3	130-110-204
PSC-Derived Cardiomyocyte Isolation Kit, human	130-110-188
StemMACS Cardiac Cultivation Medium XF, human	130-125-287
StemMACS CardioDiff Kit XF, human	130-125-289
StemMACS Cryo-Brew	130-109-558
StemMACS iPS-Brew XF, human	130-104-368

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