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## 1. Description

This product is for research use only.

**Components** 500 mL StemMACS CardioDiff Basal Medium XF, human

10 mL StemMACS CardioDiff Cardiac Cultivation Supplement XF (50×), human

**Specifications** Osmolality: 260–310 mOsmol/kg  
pH: 7.3–7.6

**Storage** Upon arrival, store StemMACS CardioDiff Basal Medium XF, human protected from light at 2–8 °C. Store StemMACS Cardiac Cultivation Supplement XF (50×), human protected from light at –20 °C.

The expiration date is indicated on the label. Avoid repeated freeze-thaw cycles. Kit components should not be substituted or mixed with those from other kits or lots.

### 1.1 Background information

Directed differentiation of specific lineages from human pluripotent stem cells (hPSCs) is a major tool for development or disease models, drug screening platforms, or cellular therapies from hPSCs. In this regard, cardiomyocytes generated from pluripotent stem cells are widely used as a model system in basic and translational research, potentially providing an unlimited supply from a single clonal source.<sup>1–3</sup>

StemMACS Cardiac Cultivation Medium XF, human is a complete and xeno-free cell culture medium for the consistent and reliable cultivation of cardiomyocytes derived from human pluripotent stem cells. This product is without phenol red.

After directed differentiation using StemMACS CardioDiff Kit XF, human (# 130-125-289), PSC-derived cardiomyocytes can be maintained in culture in StemMACS Cardiac Cultivation Medium XF for more than 30 days.

### 1.2 Applications

- Maintenance and plating of cardiomyocytes derived from human PSC lines.

## 2. Protocol

### 2.1 Preparation of complete medium

▲ Before StemMACS Cardiac Cultivation Medium XF can be used in cell culture, the complete medium needs to be prepared by mixing the two kit components.

1. Thaw supplement at 2–8 °C overnight. Mix supplement properly. Thawed material must be used immediately. Avoid repeated freeze-thaw cycles.

▲ **Note:** If white precipitate occurs, pipette up and down the sample to dissolve it.

2. Mix StemMACS CardioDiff Basal Medium XF with StemMACS CardioDiff Cardiac Cultivation Supplement XF (50×). The medium is ready-to-use now.

▲ **Note:** (Optional) Antibiotic solutions might be added to prevent contamination, e.g. 100 U/mL penicillin and 100 µg/mL streptomycin.

3. Use the complete medium within 4 weeks when stored at 2–8 °C.

### 2.2 Cell culture

1. Equilibrate complete StemMACS Cardiac Cultivation Medium XF at room temperature (20–25 °C) prior to use.

2. Replace old StemMACS Cardiac Cultivation Medium XF with fresh medium every 48 hours: 2 mL per well of a 12-well plate.

▲ **Note:** In case dead cells are visible in the supernatant, washing with D-PBS (2 mL per well) is recommended before adding fresh StemMACS Cardiac Cultivation Medium XF.

3. For prolonged culture, for example, when culturing several weeks transfer cultured cells into new culture dishes.

## 3. References

1. van Mil, A. *et al.* (2018) Modelling inherited cardiac disease using human induced pluripotent stem cell-derived cardiomyocytes: progress, pitfalls, and potential. *Cardiovasc. Res.* 114(14): 1828–1842.
2. Bernstein, D. (2017) Induced pluripotent stem cell-derived cardiomyocytes: a platform for testing for drug cardiotoxicity. *Prog. Pediatr. Cardiol.* 46: 2–6.
3. Hartman, M. E. *et al.* (2016) Human pluripotent stem cells: Prospects and challenges as a source of cardiomyocytes for *in vitro* modeling and cell-based cardiac repair. *Adv. Drug Deliv. Rev.* 96:3–17.

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