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T cell purification and activation V.2

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Moustafa Nouh Elemeery[1,2], Salix Boulet[3], louis-eric.trudeau[4], Nathalie Labrecque[5]

[1]Department of neurosciences, Faculty of Medicine, Universite de Montreal, Canada;
[2]Medical Biotechnology Department, National Research Centre, Dokki, Cairo, Egypt;
[3]Centre de recherche de l'hôpital Maisonneuve-Rosemont (CRHMR), Department of Medicine, Faculty of Medicine, Université de Montréal, Canada;
[4]Department of Pharmacology and Physiology, Faculty of Medicine, Université de Montréal, Canada;
[5]Institut de recherches cliniques de Montréal (IRCM), Department of Microbiology, Infectious Diseases and Immunology, Faculty of Medicine, Université de Montréal, Canada

L Lilia Rodriguez
Université de Montréal

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We use this protocol and it's working

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Disclaimer

ETHICS DISCLAIMER

The **protocols.io** team notes that research involving animals and humans must be conducted according to internationally-accepted standards and should always have prior approval from an Institutional Ethics Committee or Board.

Abstract

This protocol details the purification and activation of Mouse Naïve CD8+ T Cell using an isolation kit from STEMCELL. This kit is designed to isolate naïve CD62L+CD44-CD8+ T cells from single-cell suspensions of splenocytes by negative selection. Unwanted cells are targeted for removal with biotinylated antibodies that are directed against non-naïve CD8+ T cells (CD4, CD11b, CD11c, CD19, CD44, CD45R/B220, CD49b, TCRγ/δ, TER119) and streptavidin-coated magnetic particles. Labeled cells are separated using an EasySep™ magnet without the use of columns.

Materials

Reagents and solution:

	A	B	C
	Reagent or solution	**Supplier**	**Catalogue #**
	Anti-mouse CD3 (Clone: 145-2C11)	Bioxcell	BE0001
	Anti-mouse CD28 (clone: 37.51)	Leinco	C379-5.0 mg
	RPMI media	VWR (Corning)	CA45000-396
	Phosphate Buffer saline (PBS)	Gibco	14190144
	EasySep buffer	STEMCELL	20144
	EasySep™ Mouse CD8+ T Cell Isolation Kit	STEMCELL	19858
	ACK (Ammonium-Chloride-Potassium) Lysing Buffer	ThermoFisher	A1049201
	L-glutamine 200 mM	VWR	CA45000-676
	HEPES 1M	Fisher	MT25060CI
	Sodium Pyruvate	VWR	CA45000-710
	2-Mercaptoethanol	ThermoFisher	21985023
	Non-Essential Amino acids	VWR (Corning)	CA45000-700
	Fetal Bovin Serum	Gibco	12483020
	24 wells plate flat bottom suspension plates	Sarstedt	83.1836.500
	96 wells plate flat bottom suspension plates	Sarstedt	82.1581.001
	Cell strainers (70um)	Fisher	08-771-2

InVivoMAb anti-mouse CD3 **BioXcell Catalog #**BE0001

Anti-Mouse CD28 (Clone 37.51) **Leinco Technologies Inc. Catalog #**C379

RPMI **VWR International (Avantor) Catalog #**45000-396

Phosphate buffered saline (PBS) without Ca/Mg **Thermo Fisher Scientific Catalog #**14190144

EasySep™ Buffer **STEMCELL Technologies Inc. Catalog #**20144

EasySep™ Mouse Naïve CD8 T Cell Isolation Kit **STEMCELL Technologies Inc. Catalog #**19858

ACK Lysing Buffer **Thermo Fisher Scientific Catalog #**A1049201

L( )-Glutamine solution 200 mM **VWR International (Avantor) Catalog #**45000-676

Sodium pyruvate solution 100 mM **VWR International (Avantor)** **Catalog #**45000-710

2-mercaptoethanol **Gibco - Thermo Fisher Scientific** **Catalog #**21985023

Non essential amino acids **VWR International (Avantor)** **Catalog #**45000-700

Fetal Bovine Serum, qualified, Canada **Thermo Fisher** **Catalog #**12483020

Falcon™ Cell Strainers **Fisher Scientific** **Catalog #**08-771-2

RPMI complete (RPMIc):

	A	B
	RPMI	500 mL
	FBS 10%	50 mL (decomplemented)
	L-Glutamine	5 mL
	Sodium pyruvate	5 mL
	Antibiotic (Pen-Strep)	5 mL
	Non-essential amino acids	5 mL
	2-Mercaptoethanol	50 mmol/L (final)

Note

Note! Very important, 2-Mercaptoethanol is an essential growth factor for mouse T-lymphocytes.

Troubleshooting

Purification and activation

4d 0h 30m

1 Dilute CD3 antibody (145-2C11) (clone KT3 can also be used) to 1 µL in PBS.

2 Coat plates with anti-CD3 antibody.

3 Use 24 or 96 wells flat bottom suspension plates. If these plates are not used, there is a risk of partial stimulation due to low absorbance of the antibody on the plate.

3.1 Add 100 µL of antibody/well if 96 wells or 1 mL per well if 24 wells.

3.2 Incubate the plate for 24:00:00 at 4 °C or 01:00:00 at 37 °C . 1d

4 Remove the antibody (aspirate) and wash 2 times with PBS.

5 Add 100 µL of RPMIc if 96 wells or 1 mL if 24 wells and incubate the plate at 37 °C for 00:15:00 . 15m

6 Collect spleen from mice 6-8 weeks in complete RPMI media (RPMIc), sex matched with recipient mice.

7 Purify CD8+ T cells using EasySep mouse naïve purification kit (STEMCELL, catalo # 19858) as follow:

7.1 Use a frosted microscope slide to homogenize spleens in PBS or Hanks' Balanced Salt Solution (HBSS) containing 2% fetal bovine serum (FBS).

7.2 Remove aggregates and debris by passing cell suspension through a 70 µm mesh nylon strainer. Collect cells in a 15 mL tube.

7.3 Centrifuge at 1300 rpm, 00:05:00 and discard the supernatant. 5m

7.4 Red blood cells lysis is done by adding 5 mL /spleen of 0.83% ammonium chloride and incubate for 00:05:00 (or 00:02:00 for ACK lysing buffer) at Room temperature while continuously shaking tubes. 5m

7.5 Quench by filling up tube with RPMIc.

7.6 Centrifuge at 1300 rpm, 00:05:00 and discard supernatant. 5m

7.7 Resuspend in EasySep buffer at 1×10^8 cells/ml (Easysep mouse naïve CD8+ T cell isolation kit (#19858A) and follow the protocol provided by STEMCELL.

8 Wash cells with RPMIc medium.

9 Resuspend cells in 5 mL of RPMIc, count cells and adjust the concentration to 2×10^6 cells/mL

10 Add 100 µL of cells (2×10^5 cells) per well if 96 wells or 1 mL of cells (2×10^6 cells) per well if 24 wells).

11 Add purified anti-CD28 antibodies to reach a concentration of 5 µL .

12 Incubate the plate at 37 °C and 5% CO_2 for 24:00:00 . 1d

13 Add 20 Unit/ml of IL-2.

14 Incubate the plate at 37 °C and 5% CO_2 for another 48:00:00 . 2d

15

Note

***** Don't forget the non-stimulated controls.**

- Resuspend the cells well throughout the experiment (the cells quickly settle to the bottom of the tube)
- Check purity of CD8+ T cells after STEMCELL isolation by staining with anti-CD8 antibody followed by flow cytometry.
- Check activation after stimulation using anti-CD8 and anti-CD44 staining followed by flow cytometry.