

PMN- 04 Measurement of Intracellular Reactive Oxygen Species (ROS) levels in Human PMN

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1 Works for me dx.doi.org/10.17504/protocols.io.bhc9j2z6

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ABSTRACT

List of published work using this protocol:

- **Immune Profile of Hyaluronic Acid Hydrogel Polyethylene Glycol Crosslinked: An in Vitro Evaluation in Human Polymorphonuclear Leukocytes.** Franca Marino, Marco Cosentino, Massimiliano Legnaro, Alessandra Luini, Julia Sigova, Roberto Mocchi, Trello Lotti, Nicola Zerbinati. *Dermatol Ther.* 2020 Apr 10; e13388. doi: 10.1111/dth.13388. Online ahead of print.
- **A Novel Standardized Cannabis sativa L. Extract and Its Constituent Cannabidiol Inhibit Human Polymorphonuclear Leukocyte Functions.** Alex Mabou Tagne, Franca Marino, Massimiliano Legnaro, Alessandra Luini, Barbara Pacchetti, Marco Cosentino. *Int J Mol Sci.* 2019 Apr 13;20(8):1833. doi: 10.3390/ijms20081833.
- **β 2 -Adrenoceptors Inhibit Neutrophil Extracellular Traps in Human Polymorphonuclear Leukocytes.** Franca Marino, Angela Scanzano, Laura Pulze, Monica Pinoli, Emanuela Rasini, Alessandra Luini, Raffaella Bombelli, Massimiliano Legnaro, Magda de Eguileor, Marco Cosentino. *J Leukoc Biol.* 2018 Sep;104(3):603-614. doi: 10.1002/JLB.3A1017-398RR. Epub 2018 Apr 18.
- **Adrenergic Modulation of Migration, CD11b and CD18 Expression, ROS and interleukin-8 Production by Human Polymorphonuclear Leukocytes.** Angela Scanzano, Laura Schembri, Emanuela Rasini, Alessandra Luini, Jessica Dallatorre, Massimiliano Legnaro, Raffaella Bombelli, Terenzio Congiu, Marco Cosentino, Franca Marino. *Inflamm Res.* 2015 Feb;64(2):127-35. doi: 10.1007/s00011-014-0791-8. Epub 2015 Jan 6.
- **The Essential Oil of Bergamot Stimulates Reactive Oxygen Species Production in Human Polymorphonuclear Leukocytes.** Marco Cosentino, Alessandra Luini, Raffaella Bombelli, Maria T Corasaniti, Giacinto Bagetta, Franca Marino. *Phytother Res.* 2014 Aug;28(8):1232-9. doi: 10.1002/ptr.5121. Epub 2014 Jan 23.
- **Immunomodulatory Properties of Achyrocline Satureioides (Lam.) D.C. Infusion: A Study on Human Leukocytes.** Marco Cosentino, Raffaella Bombelli, Elena Carcano, Alessandra Luini, Franca Marino, Francesca Crema, Federico Dajas, Sergio Lecchini. *J Ethnopharmacol.* 2008 Mar 28;116(3):501-7. doi: 10.1016/j.jep.2007.12.014. Epub 2008 Jan 6.

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MATERIALS

NAME	CATALOG #	VENDOR
NaCl	S9625	Sigma Aldrich
C-DCFH-DA	C2938	Invitrogen - Thermo Fisher
KCl	P9541	Sigma
MgSO ₄	1.05886	Sigma
Glucose	1.08337	Sigma
CaCl ₂	1.02382	Sigma
Hepes	H7006	Sigma

MATERIALS TEXT

Dubnoff Bath

EQUIPMENT

NAME	CATALOG #	VENDOR
LS 50B	Perkin Elmer instruments	Perkin Elmer
Centrifuge 5804	Eppendorf	

- 1 Suspend isolated PMN at 1×10^6 cells/ml in **HBSS/HEPES** medium.



HBSS/HEPES for ROS measurement in PMN
by Mattia Di Rocco

- 2 Add 2×10^6 cells in **2 mL** of **HBSS/HEPES** for each tube.
- 3 Incubate for **01:00:00** with **2 Micromolar (μM)** of **C-DCFH-DA** in the **dark** at **37 °C** (Dubnoff Bath).

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Wash **twice** with  **2 mL** of HBSS/HEPES.




Each time centrifuge at  **400 x g, Room temperature 00:05:00**



Centrifuge 5804
Eppendorf Eppendorf

5 Aspirate supernatant and resuspend with  **2 mL** of HBSS/HEPES.


6 Recover PMN in cuvette of 2 ml in the **dark** at  **37 °C** (Dubnoff Bath)

7 Measurements of fluorescence must be performed by means of a **Spectrofluorimeter with excitation wavelength of 488 nm.**



LS 50B
Spectrofluorimeter
Perkin Elmer Perkin Elmer instruments

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Cuvette must be maintained at  **37 °C** by means of a thermostatic bath, that will be turned on before the starting ROS measurement.

- 9 Fluorescence emission must be collected at **525 nm** and recorded in a specific data table that will be signed for each specific experimental plan (time for recording and complete time analysis), that will be signed by the researcher.
- 10 Intracellular ROS levels must be expressed as fluorescence intensity, in arbitrary units (AU) or according to the specific experimental plan.