Macrophage cell culture

We provide a full range macrophage cell culture portfolio including media systems to generate macrophages from freshly isolated peripheral blood mononuclear cells (PBMCs) or to isolate tumor-associated macrophages (TAMs) from tumor tissues, as well as assay-ready cryopreserved M1 and M2 macrophages.

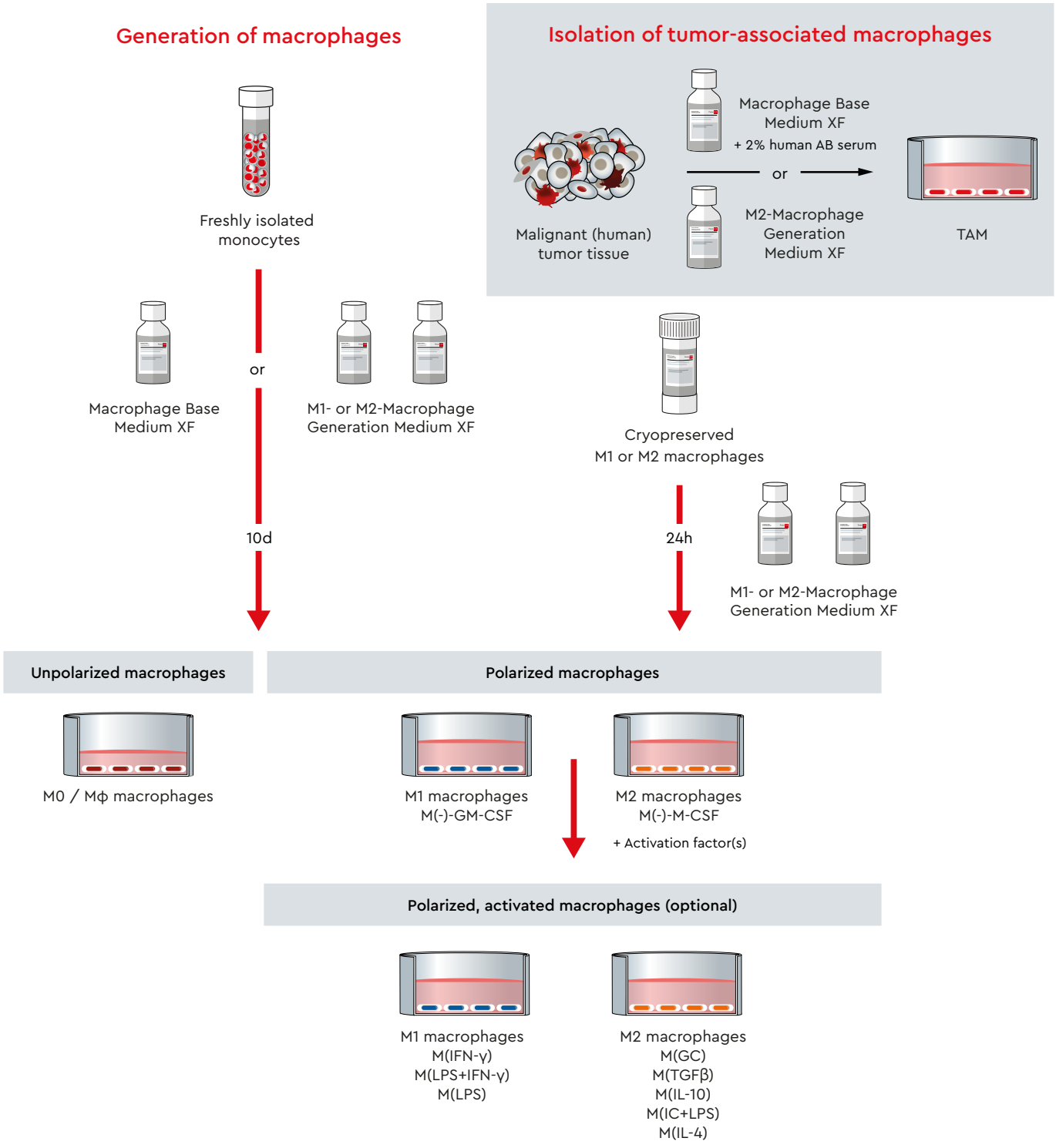


Fig. 1: PromoCell macrophage cell culture portfolio. *Overview of possible applications with our serum- and xeno-free macrophage media and cryopreserved macrophages.* *Abbreviations: IC = immune complexes, IFN = interferon, IgG = immunoglobulin G, GC = glucocorticoids, (G)M-CSF = (granulocyte/)macrophage colony stimulating factor, IL = interleukin, LPS = lipopolysaccharide, PBMC = peripheral blood mononuclear cells, TAM = tumor-associated macrophages (freshly isolated from tumor tissue), TGF = transforming growth factor.*

In vitro macrophage generation

Efficient isolation of monocytes: Monocyte Attachment Medium

The defined, animal-component free and protein-free Monocyte Attachment Medium allows for the efficient adherence selection of monocytes from freshly isolated human mononuclear cells while maintaining optimal cell health. Thus, the time-consuming and costly immunomagnetic purification of monocytes is not necessary.

Ready-to-use: M1/M2-Macrophage Generation Media XF

Our M1-Macrophage Generation Medium XF contains GM-CSF and allows for the generation of M1- polarized macrophages, whereas the M2-Macrophage Generation Medium XF contains M-CSF and produces M2- polarized macrophages. Both media are ready-to-use and tested in-house for successful differentiation of M1-/M2- macrophages via flow cytometry.

User-customizable: Macrophage Base Medium XF

The Macrophage Base Medium XF is the user-customizable version of the Macrophage Generation Media product line. It comes without cytokines as a universally applicable MDM culture system featuring a fully user-customizable macrophage differentiation and activation process (see Fig. 3 and Tab. 1 for suggestions).

Serum- and xeno-free formulation

All our Macrophage Generation Media XF are serum-free and xeno-free media formulations. Due to the utilization of exclusively synthetic, recombinant or plant-sourced materials, human serum albumin, purified from human plasma, is the only non-recombinant protein contained in this medium.

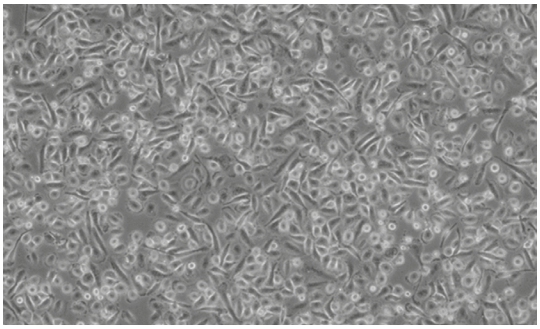


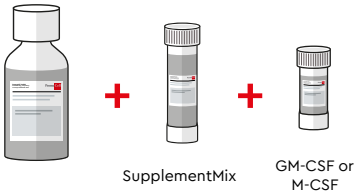
Fig. 2: Non-activated human monocyte-derived macrophages (MDM) differentiated directly from PBMC. *Monocytes were purified using the Monocyte Attachment Medium and differentiated in Macrophage Base Medium XF containing 100 ng/ml GM-CSF for 10 days.*

Monocyte Attachment Medium

Product	Size	Catalog Number
Monocyte Attachment Medium	250 ml	C-28051

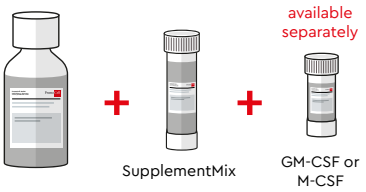
M1/M2 Ready-to-use macrophage generation media

Product	Size	Catalog Number
M1-Macrophage Generation Medium XF (incl. GM-CSF)	250 ml	C-28055
M2-Macrophage Generation Medium XF (incl. M-CSF)	250 ml	C-28056



Macrophage Base Medium XF

Product	Size	Catalog Number
Macrophage Base Medium XF	250 ml	C-28057
GM-CSF	10 µg	C-60422
M-CSF	10 µg	C-60420



Product				Macrophage Base Medium XF (C-28057)	M1-Macrophage Generation Medium XF (C-28055)	M2-Macrophage Generation Medium XF (C-28056)
Cytokines in medium				-	GM-CSF	M-CSF
Intended monocyte-derived macrophages (MDM) activation state by addition of the respective activation factor(s)*	M(IFN-γ)	GM-CSF or M-CSF	IFN-γ	√	√	-
	M(LPS+IFN-γ)	GM-CSF or M-CSF	LPS+IFN-γ	√	√	-
	M(LPS)	GM-CSF or M-CSF	LPS	√	√	-
	M(-)-GM-CSF	GM-CSF	-	√	√	-
	M0 / Mϕ	2% hAB serum	-	√	-	√
	M(-)-M-CSF	M-CSF	-	√	-	√
	M(GC)	M-CSF	DEX	√	-	√
	M(TGFβ)	M-CSF	TGF-β1	√	-	√
	M(IL-10)	M-CSF	IL-10	√	-	√
	M(IC+LPS)	M-CSF	IgG+LPS	√	-	√
	M(IL-4)	M-CSF	IL-4	√	-	√
	TAM	2% hAB serum	-	√	-	-
	MDM activation state	Differentiation factor	Activation factor(s)			

Polarization state: M1 → M2

Tab. 1: In vitro macrophage generation with the PromoCell macrophage media system. *Overview of the wide spectrum of macrophage polarization and activation states achievable with PromoCell's macrophage generation media.*

Abbreviations: DEX = dexamethasone, IC = immune complexes, IFN = interferon, IgG = immunoglobulin G, GC = glucocorticoids, (G)M-CSF = (granulocyte/)macrophage colony stimulating factor, h = human, IL = interleukin, LPS = lipopolysaccharide, PBMC = peripheral blood mononuclear cells, TAM = tumor-associated macrophages (freshly isolated from tumor tissue), TGF = transforming growth factor.
**Nomenclature by used activation factor(s)*

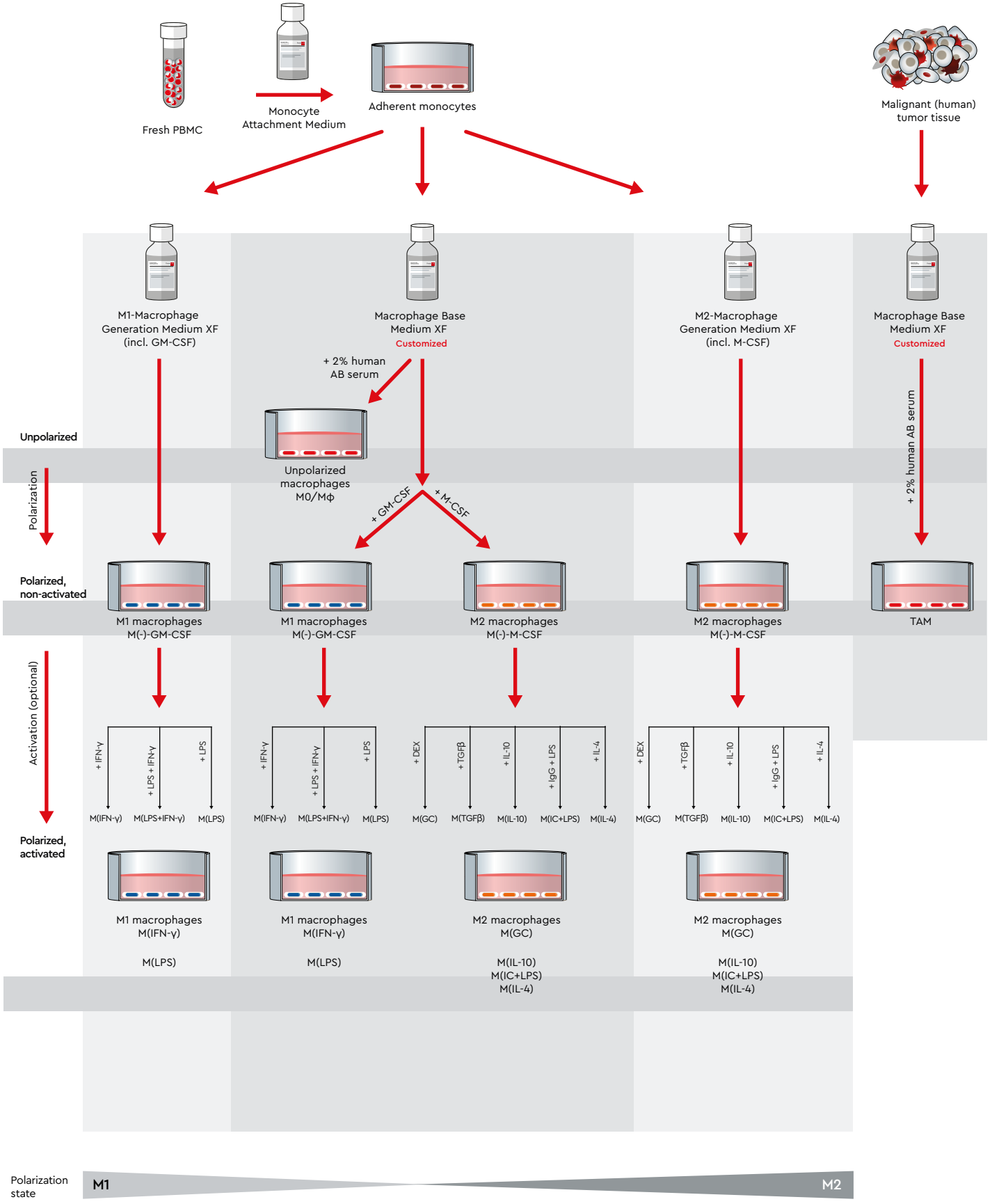


Fig. 3: In vitro macrophage generation with our macrophage media system. *Overview of the wide spectrum of macrophage polarization and activation possibilities with our media system.* *Abbreviations: DEX = dexamethasone, IC = immune complexes, IFN = interferon, IgG = immunoglobulin G, GC = glucocorticoids, (G)M-CSF = (granulocyte/) macrophage colony stimulating factor, h = human, IL = interleukin, LPS = lipopolysaccharide, PBMC = peripheral blood mononuclear cells, TGF = transforming growth factor.*

Assay-ready: Cryopreserved macrophages

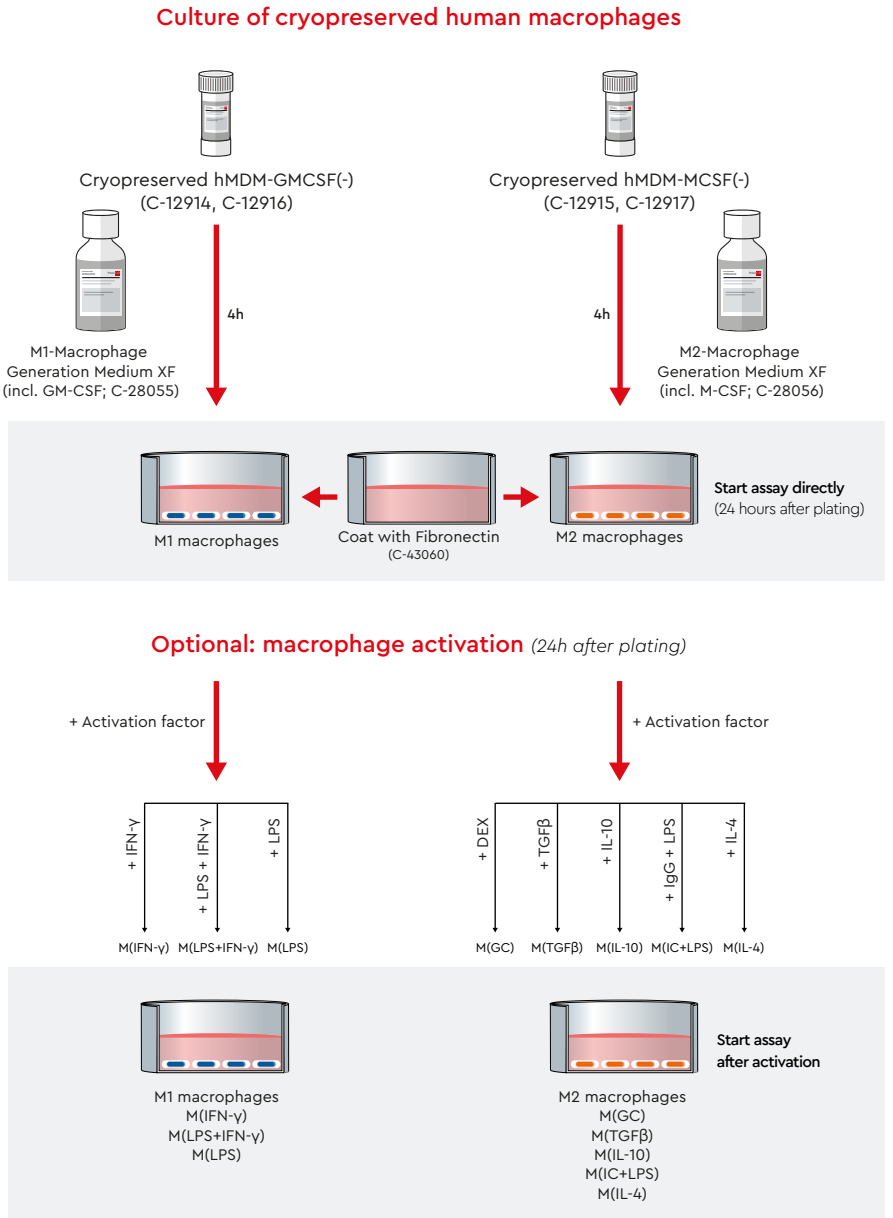
Macrophage culture made easy: Cryopreserved macrophages

- No time-consuming in vitro generation
- Ready-to-use after 24h
- Convenient access to individual donors
- Optional activation possible
- Long-term culture is supported with full functionality

Being part of our unique range of macrophage culture products, cryopreserved human macrophages are now available as a reliable source of standardized cells in a ready-to-use format allowing for full experimental flexibility (Fig. 4). The frozen macrophages are produced in our well-proven M1/M2-Macrophage Generation Media XF and are available as fully qualified M1-(hMDM-GMCSF(-)) or M2-(hMDM-MCSF(-)) polarized cells. The cells can be seeded directly into fibronectin-coated multiwell-plates, dishes and flasks. After plating, the macrophages can be maintained as biologically functional, adherent cultures (see Fig. 4) for several weeks. Optionally, user-customizable activation of the cells can be performed

Each lot is tested for cell morphology, adherence rate and viability. Furthermore, they are characterized by flow cytometric analysis of relevant markers (Fig. 5):

- M1: $CD68^+$, $CD\ 80^+$
- M2: $CD68^+$, $CD163^+$



Cryopreserved human macrophages

Product	Size	Catalog Number
Human M1 Macrophages (GM-CSF), Monocyte-derived, single donor	1,5 Mio	C-12914
Human M1 Macrophages (GM-CSF), Monocyte-derived, single donor	5 Mio	C-12916
Human M2 Macrophages (M-CSF), Monocyte-derived, single donor	1,5 Mio	C-12915
Human M2 Macrophages (M-CSF), Monocyte-derived, single donor	5 Mio	C-12917
Fibronectin Solution, human (1 mg/ml)	5 ml	C-43060

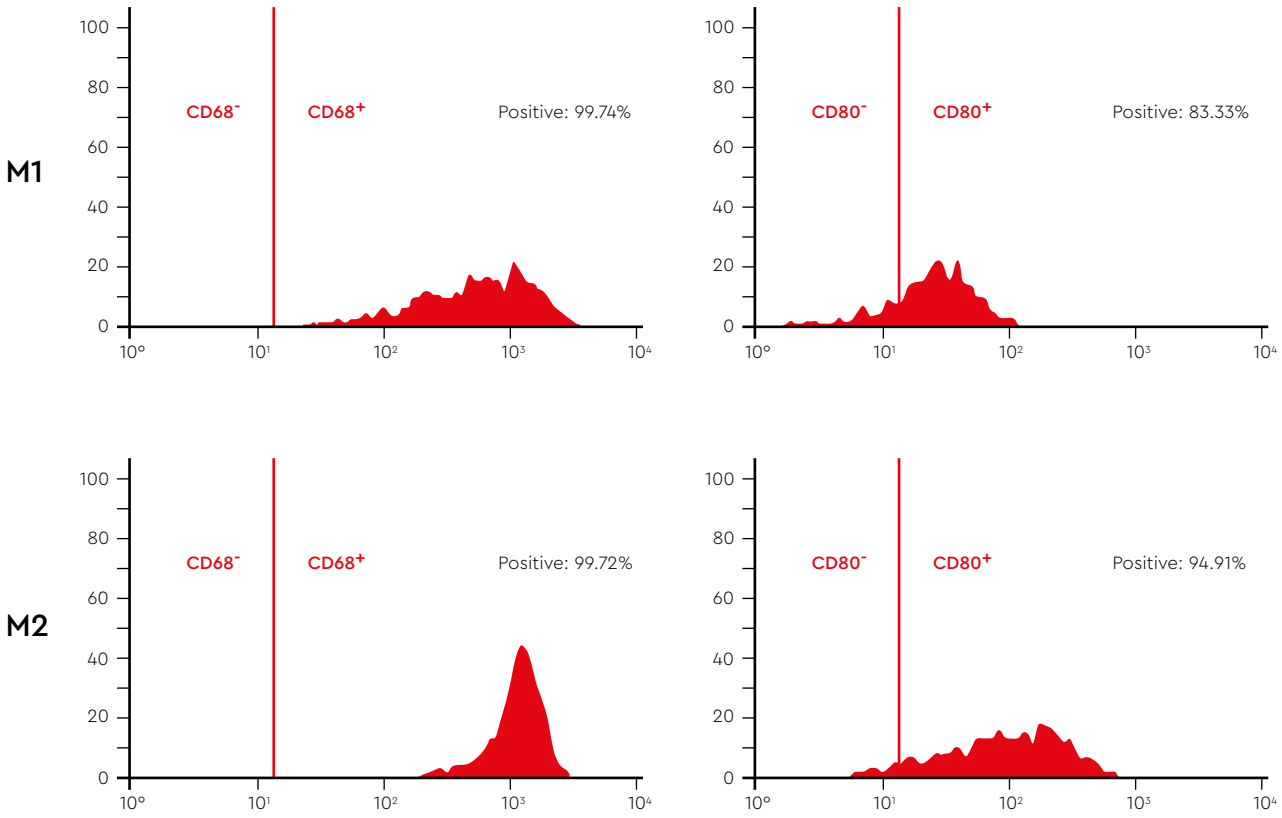


Fig. 5: Flow cytometric analysis of our cryopreserved Human M1 and M2 Macrophages. *M1 macrophages exhibit a CD68⁺ (99,74%) and CD80⁺ (83,33%) marker expression profile, typical for M1 macrophages (upper row). M2 macrophages exhibit a CD68⁺ (99,72%) and CD163⁺ (94,91%) marker expression profile, typical for M2 macrophages (lower row).*

Macrophage detachment solution

The Macrophage Detachment Solution is a chemically defined, non-enzymatic reagent especially optimized for the gentle detachment of strongly adherent macrophages.

Product	Size	Catalog Number
Macrophage Detachment Solution	250 ml	C-41330

Custom Solutions

Do you require a custom produced lot or specific donor characteristics? Contact us!

Contact us via our online form
page.promocell.com/donor-type-request
or email us at **info@promocell.com**

Find out more about our custom solutions at **promocell.com/services/custom-solutions**

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