Mouse B cells from bone marrow, spleen, and lymphoid tissue

Miltenyi Biotec

Bone marrow



Pro B cells



CD19^{+}
CD43^{+}
CD20$^{+/-}$
CD24^{+}
CD45R(B220)$^{+}$
IgM^{-}

Pre-selection with:
Pan B Cell Isolation Kit II
+
CD43 (Ly-48) MicroBeads

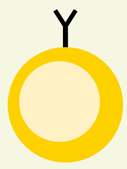
Pre B cells



CD19^{+}
CD43^{low}
CD20^{+}
CD24^{+}
CD25$^{+/-}$
CD45R(B220)$^{+}$
IgM^{-}

Pre-enrichment with:
Pan B Cell Isolation Kit II

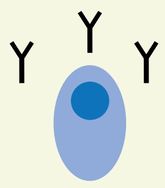
Resting B cells



CD19^{+}
CD20^{+}
CD43^{-}
CD45R (B220)$^{+}$
Ig$^{+/-}$

B cell Isolation Kit

Plasmablasts



CD19^{+}
CD138^{+}
CD45R(B220)^{low}
MHC class II^{+}
IgM/A/E/G^{+}

Pre-enrichment with:
Pan B Cell Isolation Kit II

Plasma cells



CD138^{+}
CD38^{low}
CD19^{-}
CD45R(B220)^{low}
CD93$^{+/-}$
MHC class II$^{+/-}$
Ig^{-}

CD138 MicroBeads

CD138^{+} Plasma Cell Isolation Kit

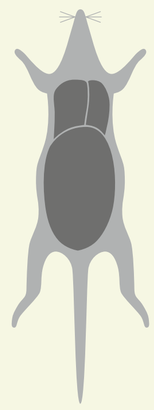
Abnormal B cells



CD19^{+}
CD20^{+}
CD5^{+}
Ig$^{+/-}$

Pan B cell Isolation Kit II

Body cavities



Pan B cell Isolation Kit II

CD19 MicroBeads

CD22 MicroBeads

CD23 MicroBeads

CD45R (B220) MicroBeads

Pan B cells

CD19^{+}
CD20^{+}
CD22^{+}
CD23$^{+/-}$
CD45R(B220)$^{+}$
CD45^{+}
Ig$^{+/-}$

B-1a Cell Isolation Kit

CD5 (Ly-1) MicroBeads

B1a cells

CD19^{+}
CD45R(B220)$^{+}$
CD5^{+}
CD11b^{+}
CD43^{+}
CD23^{-}
IgM^{high}
IgD^{low}

B-1a Cell Isolation Kit

flow through of second magnetic selection (CD5^{-} cells)

B1b cells

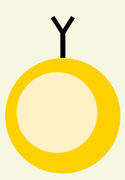
CD19^{+}
CD45R(B220)$^{+}$
CD5^{-}
CD11b^{+}
CD43^{+}
CD23^{-}
IgM^{high}
IgD^{low}

Spleen/lymphoid tissue



B Cell Isolation Kit

Resting B cells

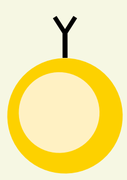


CD19^{+}
CD20^{+}
CD43^{-}
CD45R (B220)$^{+}$
Ig$^{+/-}$

MZ and FO B Cell Isolation Kit

CD23 MicroBeads

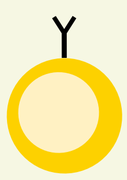
MZ and FO B cells



CD19^{+}
CD21$^{+/-}$
CD22^{+}
CD23$^{+/-}$
CD93^{-}
CD35$^{+/-}$
CD45R(B220)$^{+}$
IgM$^{+/-}$
IgD$^{+/-}$

Regulatory B Cell Isolation Kit

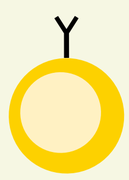
Regulatory B cells



CD19^{+}
CD5^{+}
CD24^{+}
CD1d^{high}
CD93$^{+/-}$
IL10,
TGFß secretion
IgM^{high}
IgD$^{+/-}$

Germinal Center B Cell (PNA) MicroBead Kit

Germinal center cells



PNA^{+}
CD19^{+}
CD38^{low}
CD20^{+}
CD93^{-}
GL7^{+}
CD37^{+}
IgM/A/E/G^{+}
IgD$^{+/-}$

Pre-enrichment with:
Pan B Cell Isolation Kit II

Plasmablasts



CD19^{+}
CD138^{+}
CD45R(B220)^{low}
MHC class II^{+}
IgM/A/E/G^{+}

CD138 MicroBeads

CD138^{+} Plasma Cell Cell Isolation Kit

Plasma cells



CD138^{+}
CD38^{low}
CD19^{-}
CD45R(B220)^{low}
CD93$^{+/-}$
MHC class II$^{+/-}$
Ig^{-}

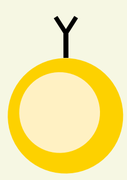
Memory B Cell Isolation Kit

Anti-Mouse IgG1 MicroBeads

Anti-Mouse IgG2a+b MicroBeads

Anti-Mouse IgM MicroBeads

Memory B cells



CD19^{+}
CD20^{+}
CD22^{+}
CD38$^{+/-}$
CD45R(B220)$^{+}$
CD95^{low}
CD80$^{+/-}$
IgM/A/E/G^{+}
IgD$^{+/-}$

Legend

- → separation
- MACS® Cell Separation products (RUO)
- MACS Flow Cytometry and Cytokine detection products (RUO)

MZ: marginal zone
FO: follicular
TGF: transforming growth factor
CD: cluster of differentiation
MHC: major histocompatibility complex
Ig: immunoglobulin
PNA: peanut agglutinin

$^{-}$ no expression
^{low} low expression
^{int} intermediate expression
$^{+}$ expression
^{high} high expression
$^{+/-}$ expression dependent on subset

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Human B cells from whole blood and bone marrow

Whole blood

Buffy coat

Leukopak

LRSC

Density gradient

PBMCs



CD45+ CD3+/–
CD14+/– CD19+/–
CD15+/– CD56+/–
HLA-DR+

StraightFrom® Whole Blood CD19 MicroBead Kit

StraightFrom Whole Blood CD45 MicroBead Kit

MACSxpress® Whole Blood Pan B Cell Isolation Kit

MACSxpress Whole Blood B Cell Isolation Kit

StraightFrom Buffy Coat CD19 MicroBead Kit

MACSxpress Buffy Coat Pan B Cell Isolation Kit

StraightFrom Leukopak CD19 MicroBead Kit

StraightFrom LRSC CD19 MicroBead Kit

MACSxpress LRSC Pan B Cell Isolation Kit

MACSxpress Whole Blood Naive B Cell Isolation Kit

StraightFrom Whole Blood CD138 MicroBeads

MACSxpress Whole Blood B-CLL Cell Isolation Kit

StraightFrom Whole Blood Anti-ROR1 MicroBead Kit

Pan B Cell Isolation Kit

CD19 MicroBeads

CD19 MultiSort Kit

CD20 MicroBeads

CD22 MicroBeads

REAlease® CD19 MicroBead Kit

Naive B Cell Isolation Kit II

Anti-IgD MicroBeads

B Cell Isolation Kit II

CD138 MicroBeads

Plasma Cell Isolation Kit II

Memory B Cell Isolation Kit

IgM+ Memory B Cell Isolation Kit

IgG+ Memory B Cell Isolation Kit

Switched Memory B Cell Isolation Kit

CD27 MicroBeads

Anti-IgG MicroBeads

Anti-IgM MicroBeads

Anti-ROR1 MicroBead Kit

CD138 MicroBeads

B-CLL Cell Isolation Kit

Pre-enrichment: B Cell Isolation Kit II + CD10 MicroBead Kit

Naive B cells	Plasma cells	Abnormal B cells	Pan B cells	Naive B cells	Resting B cells	Plasma cells	Memory B cells	Abnormal B cells
CD19+ CD20+ CD27– CD22+ IgD+	CD19low CD20– CD138+ CD38high CD27+ MHC class II+/– Ig–	CD19+ CD20+ ROR1+ CD5+ Ig+/–	CD19+ CD20+ CD22+ Ig+/–	CD19+ CD20+ CD27– CD22+ IgD+	CD19+ CD20+ CD43- CD80/86- Ig+/-	CD19low CD20– CD138+ CD38high CD27+ MHCI class II+/– Ig	CD19+ CD20+ CD27+/– CD38– CD40+ CD23low IgM/A/E/G+ IgD+/–	CD19+ CD20+ ROR1+ CD5+ CD10+ Ig+/–

Bone marrow

StraightFrom Whole Blood and Bone Marrow CD138 MicroBeads

Pre-selection with: B Cell Isolation Kit II or REAlease CD19 MicroBead Kit + CD10 and CD34 MicroBead Kits

Pre-selection with: B Cell Isolation Kit II or REAlease CD19 MicroBead Kit + CD10 MicroBead Kit

CD138 MicroBeads

Plasma Cell Isolation Kit II

Anti-ROR1 MicroBead Kit

CD138 MicroBeads

B-CLL Cell Isolation Kit

Pro B cells	Pre and/or immature B cells	Plasma cells	Abnormal CLL B cells	Plasma cells
CD10+ CD34+ CD19+ CD24+ CD38+ IgM–	CD10+ CD21+ CD19+ CD24+ CD20+ IgM+/– CD38+ IgD–	CD19low CD27+ CD20– MHCI class II+/– CD138+ Ig CD38high	CD19+ CD20+ ROR1+ CD5+ Ig+/–	CD19low CD27+ CD20– MHC class II+/– CD138+ Ig– CD38high

B cell cultivation and activation

B cells and B cell subsets

CD19+ CD22+
CD20+ Ig+/–

B Cell Expansion Kit,
TLR Ligands
Cytokines e.g., IL-4*, IL-21, TNF-α*
Human CD40-Ligand Multimer Kits

Expanded and activated B cells

CD19+ CD80/86+ CD25+
CD20+ CD69+ MHC class IIhigh
CD22+ CD30+ Ig+/–

Legend

- direct cell separation products
- separation
- differentiation/cultivation
- MACS® Cell Separation products (RUO)
- MACS Cell Culture and Stimulation products
- MACS Flow Cytometry and Cytokine detection products (RUO)

CLL: chronic lymphocytic leukemia
ROR: receptor tyrosine kinase-like orphan receptor 1
LRSC: leukocyte reduction system chamber
PBMC: peripheral blood mononuclear cells
HLA: human leukocyte antigen
TNF: tumor necrosis factor
CD: cluster of differentiation
MHC: major histocompatibility complex
Ig: immunoglobulin

– no expression
+ expression
low low expression
int intermediate expression
high high expression
+/– expression dependent on subset

*Available also as MACS GMP product

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