

# Product Catalog 2013



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# Product Information

pluriBead® offers a robust cell isolation technology for targets from different biological fluids which is easily applicable in your daily laboratory routine.

## No Centrifugation

In contrast to other cell separation methods, the pluriBead® technology does not require time-consuming centrifugation steps. This saves the highly sensitive cells from mechanical stress and keeps them vital.

## No Sample Preparation

Pretreatment of the blood, such as the production of a mononuclear cell fraction (PBMC - Peripheral Blood Mononuclear Cells) by a density gradient / density centrifugation or other methods of depletion of erythrocytes (e.g. erythrolysis) or target concentration is not required.

## No Magnets

pluriBead® gets along without magnets. To isolate target cells from sample material, pluriBead® combines the following methods:

- \* Biological: antigen - antibody - interaction to bind specific targets to catcher particles (beads)
- \* Physical: filtration / sieving to isolate the bead-bound targets from the rest of the sample
- \* Physiological: antigen - antibody - separation to detach targets from the catcher particles

The catcher particles cannot be phagocytized. They can be used at room temperature and 37°C.

## Fast Isolation

pluriBead® allows adapting incubation time to the user's needs.

### \* Example 1

If only 50-60% of the target cells are needed, an incubation time of 10 min. generates satisfactory isolation results.

### \* Example 2

If target cells are needed for RNA/DNA/Protein isolation, they can easily be processed directly from the pluriStrainer without detaching them from the beads. Thus, incubation with detachment buffer can be omitted completely.

## Ready 2 Go

pluriBead® is designed as ready-to-use kits. These contain all materials needed for your first cell separation experiment (except sample material).

- \* pluriBeads
- \* Buffers (Washing Buffer, Incubation Buffer, Stabilization Buffer, Detachment Buffer)
- \* Consumables (pluriStrainers, Connecting Rings, Funnels)

Each of these components can be ordered separately if needed. Additionally required materials are standard laboratory equipment only (disposable globes, tubes, pipettes, roller mixer).

## High Purity

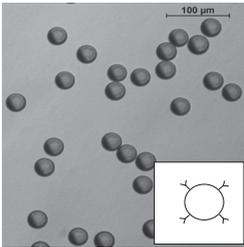
Single cell suspensions produced with pluriBead® are devoid of any additional particles. They achieve a purity of more than 98%.

# pluriBead Principle

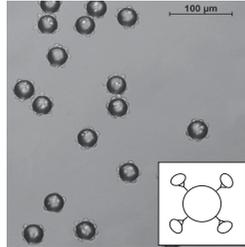
## Single-Target Cell Separation

pluriBead® is using non-magnetic monodispersed microparticles (beads) for the sorting of cell mixtures. The beads are larger than the cells and thus cannot be phagocytized by them. Their surface is modified with antibodies that recognize specific structures on the cell surface.

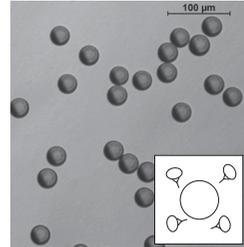
## pluriBead Particles - Phase contrast 200x



pluriBeads, no cells bound



Cells bound to pluriBeads

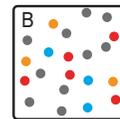
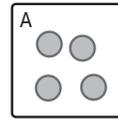


Cells released from pluriBeads

## Single-Target Cell Separation Scheme

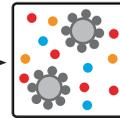
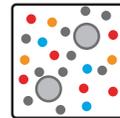
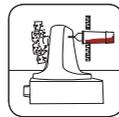
### Raw Material

- A - pluriBeads® with a target specific surface coating.
- B - Sample material (whole blood, buffy coat or tissue) with targets.



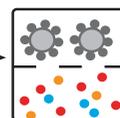
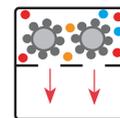
### Incubation

Sample and beads are mixed and incubated at room temperature for 10-30 min on a roller mixer or pluriPlix. The target cells will bind to the beads.



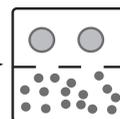
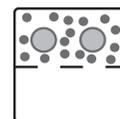
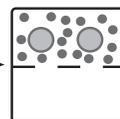
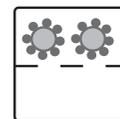
### Isolation

The bead bound target cells are isolated from the sample material with pluriStrainer. Bound targets remain on the pluriStrainer, while unwanted cells run through.



### Detachment and Separation

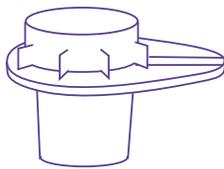
Target cells are detached from the beads with a detachment buffer directly on the strainer. They are then washed into the tube while the depleted beads remain on the strainer.



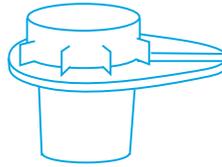
# pluriBead Principle

## Multi-Target Cell Separation

The cascade technology is an easy and fast way to simultaneously isolate more than one target from a cell suspension. To this end, the beads that bind to various cell types are differently sized. Thus labelled, target cells can be separated from the sample with pluriStrainers of different mesh size.



S-pluriStrainer purple  
mesh size s 27  $\mu\text{m}$

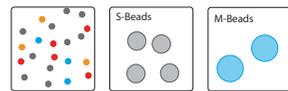


M-pluriStrainer blue  
mesh size m 54  $\mu\text{m}$

## Multi-Target Cell Separation Scheme

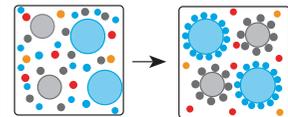
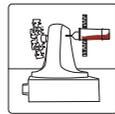
### Raw Material

Sample material (whole blood, buffy coat or tissue) with targets.  
Small and Medium pluriBeads® with a target specific surface coating.



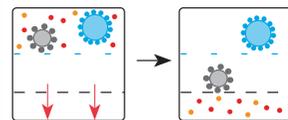
### Incubation

Sample and beads are mixed and incubated at room temperature for 10-30 min on a roller mixer or pluriPlix. The target cells will bind to the beads.



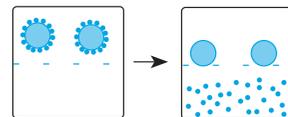
### Isolation

The bead bound target cells are isolated from the sample via a strainer cascade. Bound targets remain on the pluriStrainers, while unwanted cells run through.

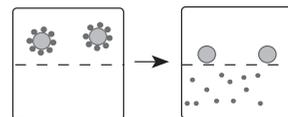


### Detachment and Separation

pluriStrainers are split on several tubes. Target cells are detached from the beads with a detachment buffer directly on the strainers.



They are then washed into the tubes while the depleted beads remain on the strainers.



# Application data for CD3

## Positive separation using pluriBead human CD3:

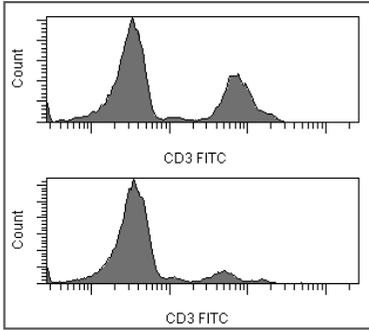


Fig. 1: Histogram of whole blood before (top) and after (below) depletion

The CD3 antigen is associated with the antigen receptor of T cells (TCR) and is expressed on T cells and thymocytes. It is necessary for signal transmission of T-cell receptor and thus for activation of T cells.

CD3 pluriBead was developed for the direct and rapid isolation of CD3-positive lymphocytes from whole blood. A prior sample preparation, such as density gradient or erythrolysis is not necessary.

The beads were added to EDTA-anticoagulated whole blood and incubated for 30 minutes. After the incubation the target cells bound to the beads were separated from all unbound blood components using a pluriBead sieve. The enriched cell fraction was then separated and detached from the particles. The target cells are now prepared and

are available for further experiments with high purity and vitality.

Figure 1 shows an example of a histogram based on the depletion of peripheral CD3-positive T-cells from whole blood. Above: whole blood prior to depletion, Bottom: whole blood after depletion 2 ml of whole blood were incubated for 15 minutes with 200,000 anti-CD3 beads. After depletion of CD3-a much smaller peak is visible. The depletion rate is dependent on the quantity used pluri-Beads and the incubation period. Depletion rates can be increased up to 100% by increasing the number of particles and incubation time.

## Enriched cell population

Figure 2 shows the FACS analysis of the enriched CD3 cell population. Shown is a compact cloud of lymphocytes without typical granulocyte and monocyte populations of whole blood.

The enriched population was first incubated for 30 minutes (RPMI medium with 10% FCS at 37° C and 5% CO<sub>2</sub>) and subsequently stained with anti-human CD3-FITC and anti-human CD45-PE coupled antibodies. The purity was determined with 99% (Fig. 3).

The apoptosis detection (Fig. 4) was performed with Annexin-PE and 7-AAD. The proportion of viable cells was 93%. Average viability of other cell types are over 90%.

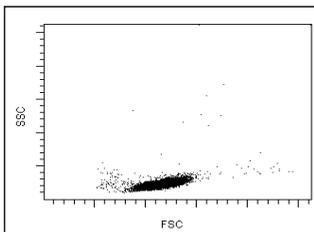


Fig. 2

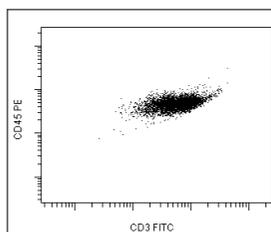


Fig. 3

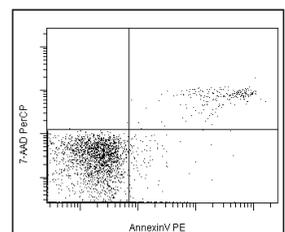


Fig. 4

# Application data for CD15

## Positive separation or depletion using pluriBead human CD15:

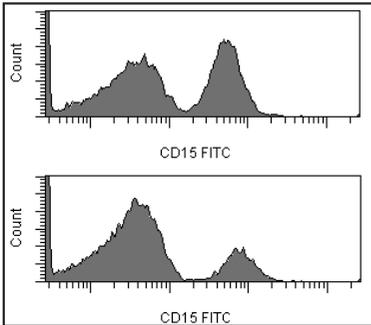


Fig. 1: Histogram of whole blood before (top) and after (below) depletion

The CD15 antigen is expressed on neutrophil and eosinophil granulocytes, and on monocytes. CD15 is not a protein, but rather a terminal trisaccharide of membrane glycolipids and glycoproteins.

CD15 pluriBead was developed for the direct and rapid isolation of CD15-positive granulocytes from whole blood. A prior sample preparation, such as density gradient or erythrolysis is not necessary.

The beads were added to EDTA-anticoagulated whole blood and incubated for 15 minutes. After the incubation the target cells bound to the beads were separated from all unbound blood components using a pluriBead sieve. The enriched cell fraction was then separated and detached from the particles. The target cells are now prepared and are available for further experiments with high purity and vitality.

Figure 1 shows an example of a histogram based on the depletion of peripheral CD15-positive cells from whole blood. Above: whole blood prior to depletion, Bottom: whole blood after depletion 2 ml of whole blood were incubated for 15 minutes with 200,000 anti-CD15 beads. After depletion of CD15 a much smaller peak is visible. The depletion rate is dependent on the quantity used pluriBeads and the incubation period. Depletion rates can be increased up to 100% by increasing the number of particles and incubation time.

## Enriched cell population

Figure 2 shows the FACS analysis of the enriched CD15 cell population. Shown is a compact cloud of granulocyte without typical lymphocyte and monocyte populations of whole blood.

The enriched population was first incubated for 30 minutes (RPMI medium with 10% FCS at 37° C and 5% CO<sub>2</sub>) and subsequently stained with anti-human CD15-FITC and anti-human CD45-PE coupled antibodies. The purity was determined with 95% (Fig. 3).

The apoptosis detection (Fig. 4) was performed with AnnexinV-PE and 7-AAD. The proportion of viable cells was 96%. Average viability of other cell types are over 90%.

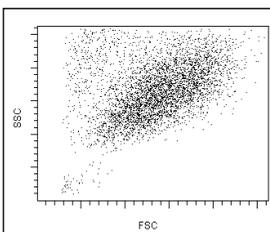


Fig. 2

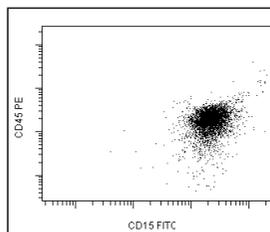


Fig. 3

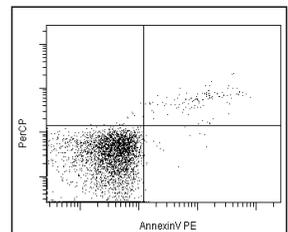


Fig. 4

# pluriBead Products



Fig.: pluriBead Cell Separation products: pluriStrainers, pluriBeads, pluriBead Kit, pluriPlix

# pluriBead Suspension Human

**pluriBead suspension** - for use with any human sample material

	<b>Target cells</b>	<b>Order No. (4ml s-beads for 200 separations)*</b>	<b>Order No. (10ml m-beads for 200 separations)**</b>
CD2	T-Cells, NK-Cells	19-00200-10	19-00200-20
CD3	T-Cells, Thymocytes	19-00300-10	19-00300-20
CD4	Helper T-Cells	19-00400-10	19-00400-20
CD5	T-Cells, B-Cells subset, Thymocytes	19-00500-10	19-00500-20
CD8	Cytotoxic T-Cells	19-00800-10	19-00800-20
CD9	Platelets	19-00900-10	19-00900-20
CD11a	Leucocytes	19-011a0-10	19-011a0-20
CD11b	Granulocytes	19-011b0-10	19-011b0-20
CD14	Monocytes	19-01400-10	19-01400-20
CD15	Granulocytes	19-01500-10	19-01500-20
CD16	Neutrophils, Granulocytes	19-01600-10	19-01600-20
CD19	B-Cells	19-01900-10	19-01900-20
CD21	B-Cells	19-02100-10	19-02100-20
CD25	Regulatory T-Cells, B-Cells	19-02500-10	19-02500-20
CD31	Endothelial Cells, Platelets	19-03100-10	19-03100-20
CD43	T-Cells, NK-Cells, Granulocytes	19-04300-10	19-04300-20
CD44	Most Tissue Cells	19-04400-10	19-04400-20
CD45	Leukocytes	19-04500-10	19-04500-20
CD55	Hematopoietic Cells	19-05500-10	19-05500-20
CD95	Apoptotic Cells	19-09500-10	19-09500-20
CD235a	Erythrocytes, Red Blood Cells	19-235a0-10	19-235a0-20
CD326 (EpCam)	Epithelial Cells	19-32600-10	19-32600-20

\* mind. 20µl beads per 1ml sample | \*\* mind 50µl beads per 1ml sample

# pluriBead Suspension Mouse

pluriBead Suspension - for use with any murine sample material

	<b>Target cells</b>	<b>Order No. (4ml s-beads for 200 separations)*</b>	<b>Order No. (10ml m-beads for 200 separations)**</b>
CD4	Helper T-Cells	29-00400-10	29-00400-20
CD8	Cytotoxic T-Cells	29-00800-10	29-00800-20
CD11b	Monocytes	29-011b0-10	29-011b0-20
CD11c	Dendritic Cells	29-011c0-10	29-011c0-20
CD14	Monocytes	29-01400-10	29-01400-20
CD19	B-Cells	29-01900-10	29-01900-20
CD45	Leukocytes	29-04500-10	29-04500-20
Ly6G	Granulocytes	29-Ly6G0-10	29-Ly6G0-20

\* mind. 20µl beads per 1ml sample | \*\* mind 50µl beads per 1ml sample

# pluriBead Suspension Universal

**pluriBead Suspension** - for use with any external antibody

<b>Product</b>	<b>Description</b>	<b>Order No. (4ml s-beads for 200 separations)*</b>	<b>Order No. (10ml m-beads for 200 separations)**</b>
anti Mouse <sup>(*)</sup>	anti mouse labeled pluriBeads	31-GTaMS-10	31-GTaMS-20
anti Rat <sup>(*)</sup>	anti rat labeled pluriBeads	31-GTaRT-10	31-GTaRT-20
anti Rabbit <sup>(*)</sup>	anti rabbit labeled pluriBeads	31-GTaRB-10	31-GTaRB-20
anti Hamster <sup>(*)</sup>	anti hamster labeled pluriBeads	31-GTaHS-10	31-GTaHS-20
anti Goat <sup>(*)</sup>	anti goat labeled pluriBeads	31-RBaGT-10	31-RBaGT-20

\* mind. 20µl beads per 1ml sample | \*\* mind 50µl beads per 1ml sample

(\*)polyclonal antibody produced from the serum of host animal: goat (goat antibodies produced from rabbit)

# Buffers

## Wach Buffer Components

Product	Description	Order No. amount for 1L	Order No. amount for 5L	Order No. amount for 10L
PBS 10x	PBS solution 10x pH 7,4	60-00010-10 (100ml)	60-00010-11 (500ml)	60-00010-12 (1000ml)
BSA 10%	BSA solution 10% pH 7,4	60-00020-10 (50ml)	60-00020-11 (250ml)	60-00020-12 (500ml)
EDTA 100x	EDTA solution 100x pH 7,4	60-00030-10 (10ml)	60-00030-11 (50ml)	60-00030-12 (100ml)

## Other Buffers

Product	Description	Package Size	Order No.
Detach- ment Buffer	supports detachment of the isolated target cells from pluriBead particles	20ml	60-00040-12
Incuba- tion Buffer	for use with tissue samples only, supports incubation	50ml	60-00060-12
Stabili- zation Buffer	for use with buffy coat samples only, supports cell separation	25ml	60-00070-12

# Separation Devices & Strainers

## Separation Devices

<b>Product</b>	<b>Description</b>	<b>Order No. 25 pc</b>
pluriStrainer S	sieve for filtering pluriBead S-beads or primary cells	43-50027-03
pluriStrainer M	sieve for filtering pluriBead M-beads or primary cells	43-50054-03
Connecting ring	supports detachment of target cells from pluriBead particles directly on pluriStrainer	41-50000-03
Funnel	supports sample load (> 4ml) onto pluriStrainer	42-50000-03
Buffy Coat Add-On	supports pre-filtering of buffy coat samples (sample preparation). Incl. 10 pre-separation strainers, 10 funnels, 10ml stabilisation buffer.	01-00600-10 (1 kit)

## Cell Strainers

<b>Product</b>	<b>Description</b>	<b>Order No. 25 pc</b>
pluriStrainer 6µm	sieve for cells and cell aggregates	43-50006-03
pluriStrainer 10µm	sieve for cells and cell aggregates	43-50010-03
pluriStrainer 15µm	sieve for cells and cell aggregates	43-50015-03
pluriStrainer 17µm	sieve for cells and cell aggregates	43-50017-03
pluriStrainer 20 µm	sieve for cells and cell aggregates	43-50020-03
pluriStrainer 80 µm	sieve for cells and cell aggregates	43-50080-03
pluriStrainer 90 µm	sieve for cells and cell aggregates	43-50090-03

# pluriPlix Universal Mixer

for use on top of magnetic stirrer

<b>Product</b>	<b>Description</b>	<b>Order No. 1 pc</b>
pluriPlix® 2	2-armed universal mixer	50-01010-80
pluriPlix® 2 Starter Kit	2- armed universal mixer <b>plus</b> pluriBeads of choice	ask for individual offer

# pluriBead Customizing Service

for coupling of any external protein (e.g. antibody, cytokine, enzyme) to pluriBead particles

<b>Product</b>	<b>Description</b>	<b>Order No.</b>
Covalently bound	min. size of external protein: 50µg lead time: 24 hours, protein will stay on the bead after denaturing, no interfering with downstream analysis	ask for individual offer
Covalently bound with spacer	min. size of external protein: 50µg lead time 24: hours, protein will stay on the bead after denaturing, no interfering with downstream analysis	ask for individual offer
Cleavable spacer	min. size of external protein: 100µg lead time: 72 hours Catcher and target will be eluted by denaturing	ask for individual offer

# Ready-2-Go Kits Human

**Mini** - for 100 separations

	<b>Target cells</b>	<b>Order No. (2ml s-beads for 100 separations)*</b>	<b>Order No. (5ml m-beads for 100 separations)**</b>
CD2	T-Cells, NK-Cells	11-00200-11	11-00200-21
CD3	T-Cells, Thymocytes	11-00300-11	11-00300-21
CD4	Helper T-Cells	11-00400-11	11-00400-21
CD5	T-Cells, B-Cells subset, Thymocytes	11-00500-11	11-00500-21
CD8	Cytotoxic T-Cells	11-00800-11	11-00800-21
CD9	Platelets	11-00900-11	11-00900-21
CD11a	Leucocytes	11-011a0-11	11-011a0-21
CD11b	Granulocytes	11-011b0-11	11-011b0-21
CD14	Monocytes	11-01400-11	11-01400-21
CD15	Granulocytes	11-01500-11	11-01500-21
CD16	Neutrophils, Granulocytes	11-01600-11	11-01600-21
CD19	B-Cells	11-01900-11	11-01900-21
CD21	B-Cells	11-02100-11	11-02100-21
CD25	Regulatory T-Cells, B-Cells	11-02500-11	11-02500-21
CD31	Endothelial Cells, Platelets	11-03100-11	11-03100-21
CD43	T-Cells, NK-Cells, Granulocytes	11-04300-11	11-04300-21
CD44	Most Tissue Cells	11-04400-11	11-04400-21
CD45	Leukocytes	11-04500-11	11-04500-21
CD55	Hematopoietic Cells	11-05500-11	11-05500-21
CD95	Apoptotic Cells	11-09500-11	11-09500-21
CD235a	Erythrocytes, Red Blood Cells	11-235a0-11	11-235a0-21
CD326 (EpCam)	Epithelial Cells	11-32600-11	11-32600-21

\* mind. 20µl beads per 1ml sample | \*\* mind 50µl beads per 1ml sample

# Ready-2-Go Kits Human

**Maxi** - for 200 separations

	<b>Target cells</b>	<b>Order No. (4ml s-beads for 200 separations)*</b>	<b>Order No. (10ml m-beads for 200 separations)**</b>
CD2	T-Cells, NK-Cells	11-00200-12	11-00200-22
CD3	T-Cells, Thymocytes	11-00300-12	11-00300-22
CD4	Helper T-Cells	11-00400-12	11-00400-22
CD5	T-Cells, B-Cells subset, Thymocytes	11-00500-12	11-00500-22
CD8	Cytotoxic T-Cells	11-00800-12	11-00800-22
CD9	Platelets	11-00900-12	11-00900-22
CD11a	Leucocytes	11-011a0-12	11-011a0-22
CD11b	Granulocytes	11-011b0-12	11-011b0-22
CD14	Monocytes	11-01400-12	11-01400-22
CD15	Granulocytes	11-01500-12	11-01500-22
CD16	Neutrophils, Granulocytes	11-01600-12	11-01600-22
CD19	B-Cells	11-01900-12	11-01900-22
CD21	B-Cells	11-02100-12	11-02100-22
CD25	Regulatory T-Cells, B-Cells	11-02500-12	11-02500-22
CD31	Endothelial Cells, Platelets	11-03100-12	11-03100-22
CD43	T-Cells, NK-Cells, Granulocytes	11-04300-12	11-04300-22
CD44	Most Tissue Cells	11-04400-12	11-04400-22
CD45	Leukocytes	11-04500-12	11-04500-22
CD55	Hematopoietic Cells	11-05500-12	11-05500-22
CD95	Apoptotic Cells	11-09500-12	11-09500-22
CD235a	Erythrocytes, Red Blood Cells	11-235a0-12	11-235a0-22
CD326 (EpCam)	Epithelial Cells	11-32600-12	11-32600-22

\* mind. 20µl beads per 1ml sample | \*\* mind 50µl beads per 1ml sample

# Ready-2-Go Kits Mouse

## Mini - for 100 separation

Target cells		Order No. (2ml s-beads for 100 separations)*	Order No. (5ml m-beads for 100 separations)**
CD4	Helper T-Cells	21-00400-11	21-00400-21
CD8	Cytotoxic T-Cells	21-00800-11	21-00800-21
CD11b	Monocytes	21-011b0-11	21-011b0-21
CD11c	Dendritic Cells	21-011c0-11	21-011c0-21
CD14	Monocytes	21-01400-11	21-01400-21
CD19	B-Cells	21-01900-11	21-01900-21
CD45	Leukocytes	21-04500-11	21-04500-21
Ly6G	Granulocytes	21-Ly6G0-11	21-Ly6G0-21

\* mind. 20µl beads per 1ml sample | \*\* mind 50µl beads per 1ml sample

## Maxi - for 200 separations

Target cells		Order No. (4ml s-beads for 200 separations)*	Order No. (10ml m-beads for 200 separations)**
CD4	Helper T-Cells	21-00400-12	21-00400-22
CD8	Cytotoxic T-Cells	21-00800-12	21-00800-22
CD11b	Monocytes	21-011b0-12	21-011b0-22
CD11c	Dendritic Cells	21-011c0-12	21-011c0-22
CD14	Monocytes	21-01400-12	21-01400-22
CD19	B-Cells	21-01900-12	21-01900-22
CD45	Leukocytes	21-04500-12	21-04500-22
Ly6G	Granulocytes	21-Ly6G0-12	21-Ly6G0-22

\* kits include pluriBead catcher particles, buffers and 10 separation devices

# Ready-2-Go Kits Universal

anti [species] labelled pluriBeads for use with external antibodies, followed by a standard pluriBead cell separation protocol

## Mini - for 100 separation

Product	Description	Order No. (2ml s-beads for 100 separations)*	Order No. (5ml m-beads for 100 separations)**
anti Mouse**	labeled pluriBeads	11-GTaMS-11	11-GTaMS-21
anti Rat**	labeled pluriBeads	11-GTaRT-11	11-GTaRT-21
anti Rabbit**	labeled pluriBeads	11-GTaRB-11	11-GTaRB-21
anti Hamster**	labeled pluriBeads	11-GTaHS-11	11-GTaHS-21
anti Goat**	labeled pluriBeads	11-RBaGT-11	11-RBaGT-21

\* mind. 20µl beads per 1ml sample | \*\* mind 50µl beads per 1ml sample

\*\*polyclonal antibodies produced from the serum of host animal: goat (goat antibodies produced from rabbit)

## Maxi - for 200 separations

Product	Description	Order No. (4ml s-beads for 200 separations)*	Order No. (10ml m-beads for 200 separations)**
anti Mouse**	labeled pluriBeads	11-GTaMS-12	11-GTaMS-22
anti Rat**	labeled pluriBeads	11-GTaRT-12	11-GTaRT-22
anti Rabbit**	labeled pluriBeads	11-GTaRB-12	11-GTaRB-22
anti Hamster**	labeled pluriBeads	11-GTaHS-12	11-GTaHS-22
anti Goat**	labeled pluriBeads	11-RBaGT-12	11-RBaGT-22

\* kits include pluriBead catcher particles, buffers and 10 separation devices

\*\*polyclonal antibodies produced from the serum of host animal: goat (goat antibodies produced from rabbit)

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