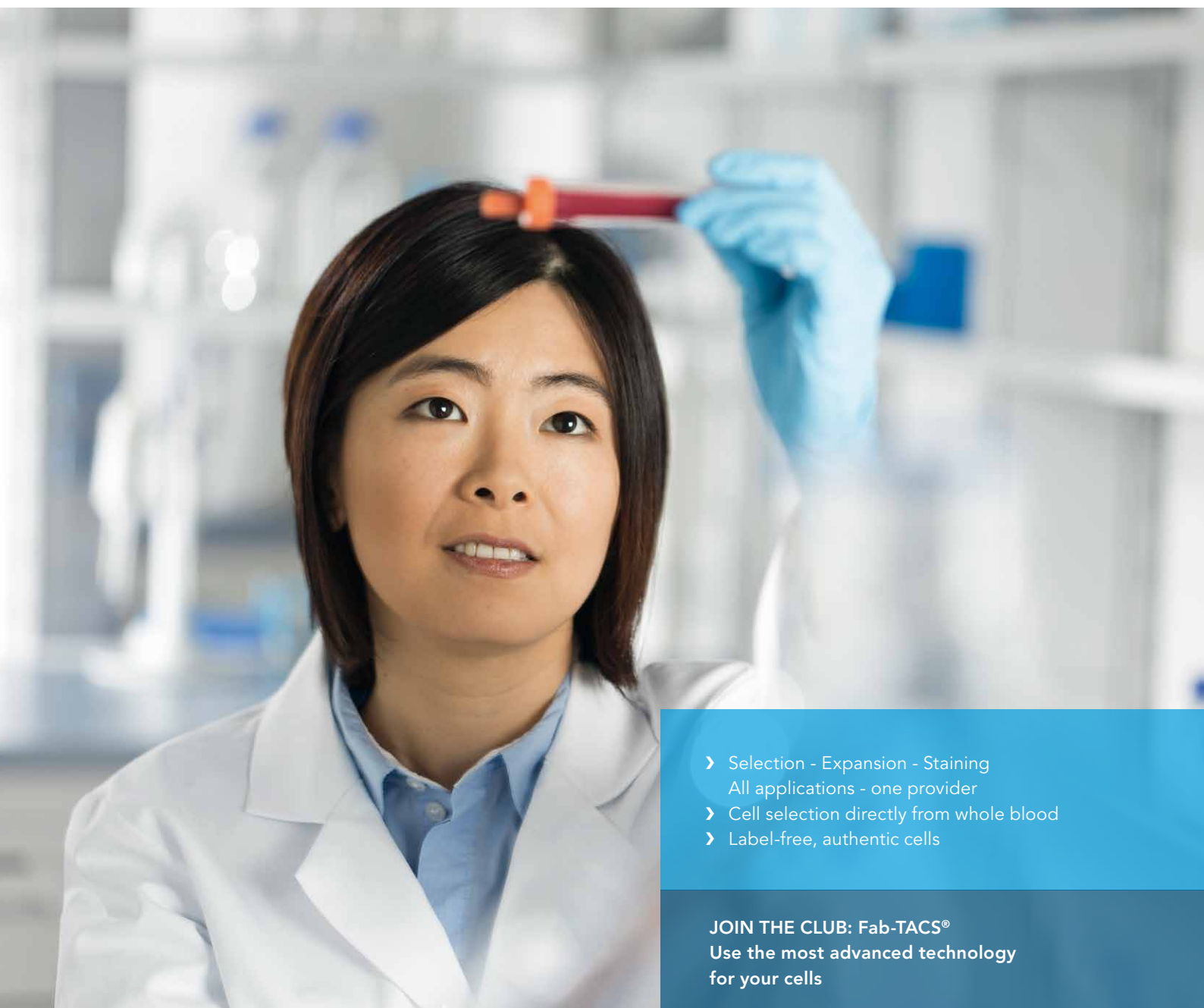


# CELL SELECTION & EXPANSION

Products for highest quality cell applications



- › Selection - Expansion - Staining  
All applications - one provider
- › Cell selection directly from whole blood
- › Label-free, authentic cells

**JOIN THE CLUB: Fab-TACS®**  
Use the most advanced technology  
for your cells

## IBA'S CELL SELECTION & EXPANSION PORTFOLIO

### Fab-based Traceless Affinity Cell Selection (Fab-TACS®) .....2

This new technology allows gentle selection of authentic cells directly from whole blood based on a cell-grade agarose matrix.

No magnetic beads, no nanobeads, no high affinity antibodies!



### Manual cell selection: Fab-TACS® Gravity .....4

Manual chromatography columns allow the selection of specific cell populations without the need for any further equipment.

Cell Isolation

Cell Expansion

Cell Staining



### Automated cell selection

IBA's cell selection devices ensure fully automatic enrichment of target cells in a highly reproducible manner.

### › FABian® .....7

It is a small bench top instrument which is used to select cells for up to 9 ml whole blood or other sources.



### › CELLina® .....back side

This fully automated large-scale device is currently under development. It is designed for high-quality cell selection directly from up to 100 ml whole blood or buffy coat.

Cell Isolation

Cell Expansion

Cell Staining

---

## Streptamer® technology .....8

This powerful technology allows different cell applications such as cell isolation, cell expansion and cell staining.

### Magnetic Cell Selection .....9

Conventional magnetic cell selection for receptor-specific or antigen-specific T cell isolation based on the fully reversible Streptamer® technology.



Cell isolation via magnetic beads conjugated to Fab Streptamers®

### Cell Stimulation & Expansion .....10

Naive T cell activation, proliferation and differentiation with CD3/CD28 Streptamers®. The fully reversible stimulation allows precise results.



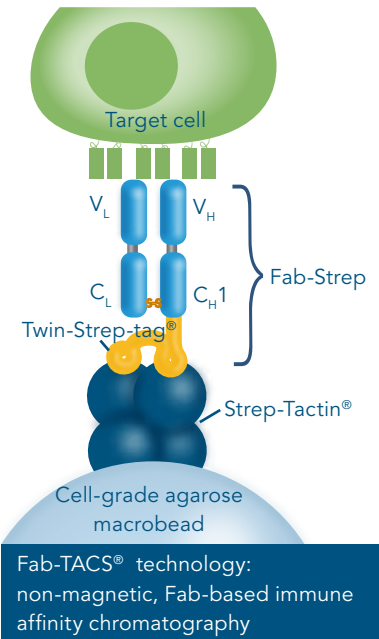
T cell expansion with CD3/CD28 Streptamer®

### Fluorescent Cell Staining/FACS .....11

Receptor-specific T cell or antigen-specific T cell staining based on the fully reversible Streptamer® technology.



Cell staining via fluorescence labeled MHC I Streptamers®



Fab-TACS® - TRACELESS AFFINITY CELL SELECTION

IBA’s unique Strep-tag®/Strep-Tactin® system is the platform for the novel traceless affinity cell selection (Fab-TACS® ) of cells. Fab-TACS® uses immune affinity chromatography based on CD-specific Fab-fragments for reversible capture and release of target cells. The innovative Fab-TACS® procedure delivers label-free, non-activated target cells in a standardized manner of highly reproducible quality directly from whole blood or other blood preparations.

The Fab-TACS® positive selection avoids the use of high affinity antibodies whose usage causes unfavorable effects like strong and almost irreversible binding to cells, cell stimulation as well as receptor blockade.

Manual and automated cell selection with Fab-TACS®

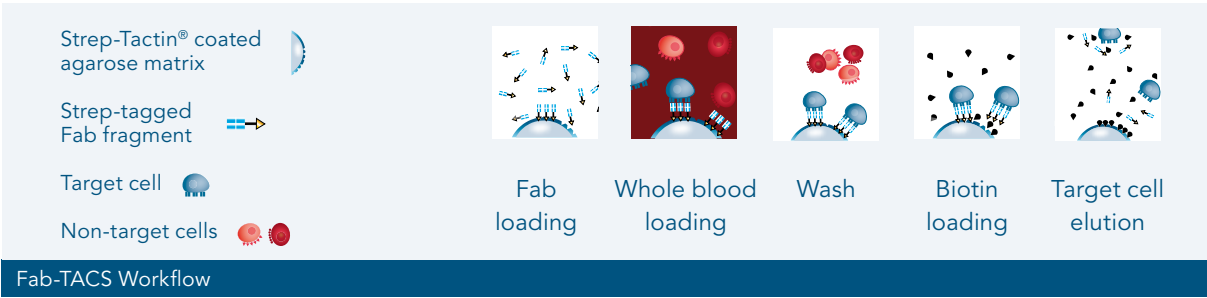
Application	Product
Manual Cell Selection	Fab-TACS® Gravity
Automated Cell Selection (small-scale)	FABian®
Automated Cell Selection (large-scale)	CELLina®

Simple Workflow

Columns for either Fab-TACS® Gravity or FABian® are filled with a Strep-Tactin® coated matrix made of cell-grade agarose. Strep-tagged Fab fragments (Fab-Streps) specifically bind to the matrix. Subsequently, whole blood or other blood preparations pass through the column. Target cells adhere to the matrix based on the exclusive binding of the Fab-Strep to the target cell. Non-target cells are efficiently washed away. In a final step, the addition of biotin causes the elution of the target cells and the Fab-Streps. After elution, the Fab-Streps self-dissociate from the cell surfaces. The label-free authentic target cells are now ready for further downstream applications.

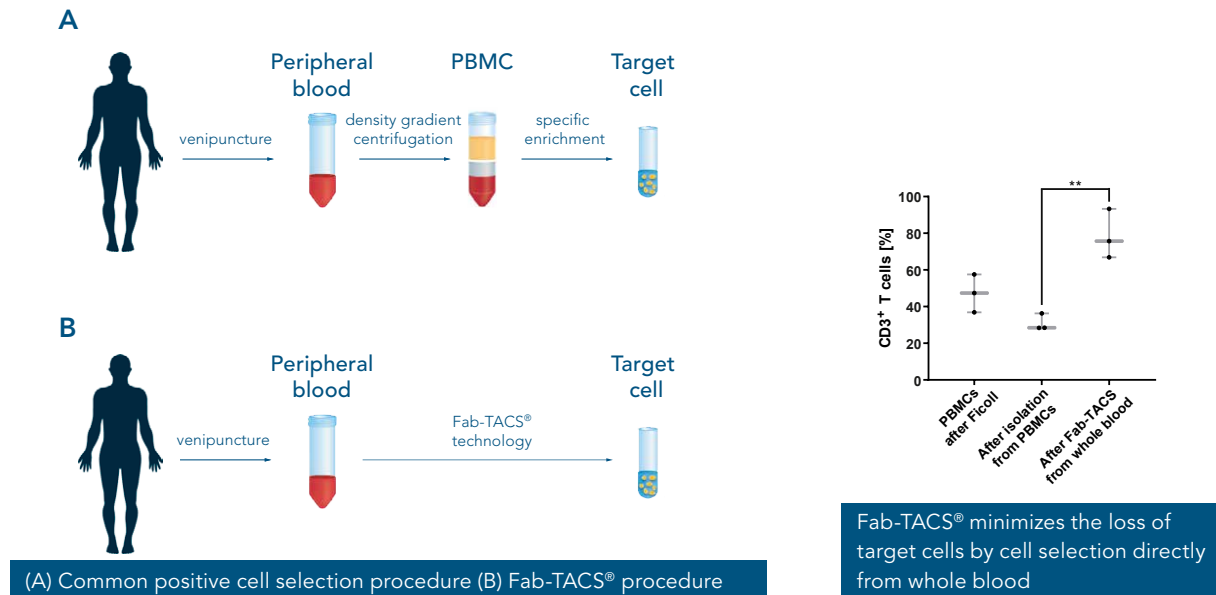
**Key Features:**

- › High purity
- › High yield
- › High viability
- › Label-free cells
- › Directly from whole blood
- › No centrifugation



## Fab-TACS® is highly efficient

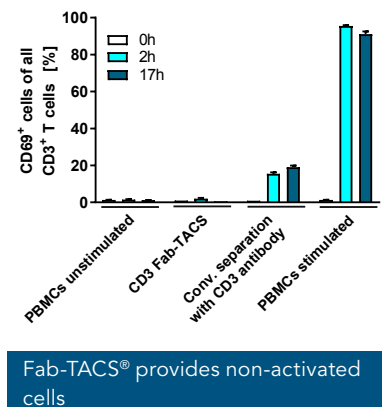
Common positive cell selection procedures require the preparation of the PBMC fraction prior to final target cell selection. In contrast, the Fab-TACS® technology allows direct cell isolation from whole blood, which saves time (at least 90 min for a PBMC preparation) and minimizes the loss of target cells (see below).



## The reversible Fab-TACS® technology provides non-activated cells

Fab-TACS® is a traceless affinity cell selection process, which works with low affinity Fab-Strep fragments and a Strep-Tactin® multimer. The Fab fragments are multimerized on Strep-Tactin® during the cell selection process. After addition of biotin, the Strep-Tactin® multimer is released from the Fab fragment. The Fab fragment then self-dissociates from the target cell due to its low affinity character. This allows the isolation of label-free and non-activated cells.

In comparison, cells purified in a positive cell selection process are labelled with high affinity antibodies. Those antibodies stick to the cells even after the selection process, which leads to an activation of the cells and influences downstream applications.





Fab-TACS Gravity - Introductory Kit

## MANUAL CELL SELECTION - Fab-TACS GRAVITY

The Fab-TACS Gravity column is a common chromatography flow column filled with a Strep-Tactin® coated matrix made of cell-grade agarose. It allows the easy and specific selection of target cells in high yields and purity directly from whole blood, buffy coat or other single-cell tissue suspensions and, what is more, no further expensive equipment is needed.

### Fab-TACS Gravity - Introductory Kit

Cat. no. 6-6299-002

- › 2x Fab-TACS Gravity columns
- › Fab-Strep of choice
- › Buffer CI (10x)
- › Biotin Stock Solution



Fab-TACS Gravity

### Composition of Fab-TACS Gravity isolation kits

Content of the kit	4x kit	10x kit
Fab-TACS Gravity Column	4	10
Fab-Strep	1	2
Buffer CI (10x)	1	1
Biotin stock solution	1	2
Fab-TACS Gravity Adapter	1	2
Fab-TACS Flow Restrictor, Pack of 5	1	2

### Available isolation kits for Fab-TACS Gravity

Species	Product description	Size	Cat. no.
human	CD3 T cells	4x kit	6-6201-004
		10x kit	6-6201-010
	CD4 T helper cells and monocytes	4x kit	6-6202-004
		10x kit	6-6202-010
	CD8 Cytotoxic T cells	4x kit	6-6203-004
		10x kit	6-6203-010
mouse	CD4 T helper cells	4x kit	6-6401-004
		10x kit	6-6401-010



Fab-TACS Gravity with Adapters

### Accessory

Product description	Size	Cat. no.
Fab-TACS Gravity Adapter (for use with 50 ml Falcon tube)	1 adapter	6-6331-001

## AUTOMATED CELL SELECTION - FABian®

The FABian® cell selection device is a fully automatic bench top instrument which automates the whole selection procedure based on IBA's novel Fab-TACS technology. Similarly, the cells of interest can be isolated in high yields, high viability and purity from diverse sources such as whole blood, buffy coat or other cell suspensions.

Automation of the cell selection process secures highly reproducible results and also saves time, e.g. for PBMC preparation.

### Key benefits

- › Highly reproducible
- › Automatic process - minimal hands-on time
- › Compact & light
- › Embedded system, no external computer needed
- › Magnet-free process

### FABian® device

Product description	Cat. no.
<b>FABian®</b> automated cell selection system with 10 ml syringe	6-6100-260

### Isolation kits for FABian®

Species	Product description	Size	Cat. no.
human	CD3 Isolation Kit	1 kit	6-6001-001
		10 kits	6-6001-010
	CD4 Isolation Kit	1 kit	6-6002-001
		10 kits	6-6002-010
	CD8 Isolation Kit	1 kit	6-6003-001
		10 kits	6-6003-010
	CD14 Isolation Kit	1 kit	6-6017-001
		10 kits	6-6017-010
	CD28 Isolation Kit	1 kit	6-6014-001
		10 kits	6-6014-010
	PBMC Isolation Kit	1 kit	6-6015-001
		10 kits	6-6015-010

### Content of the FABian® cell selection kits:

- › 1 vial of receptor-specific Fab-Strep
- › 1 vial of biotin for cell elution
- › 1 bottle of cell isolation buffer
- › 1 Fab-TACS auto column
- › 1 tube and syringe set

Depending on the kit, up to 9 ml of whole blood or up to 6.25 ml buffy coat can be processed.





## STREPTAMER® TECHNOLOGY

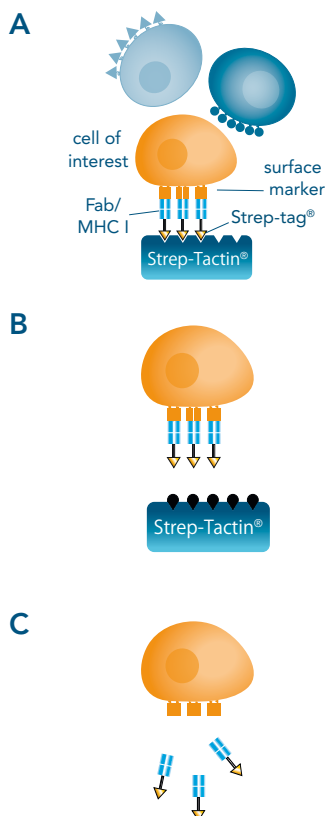
### Streptamer technology

- › Authentic cell populations
- › Fully reversible mechanism
- › Isolation, expansion, staining

The Streptamer® technology is a powerful tool which meets the need of scientists to study authentic non-modified cells. This is required for reliable and reproducible results.

The Streptamer® portfolio covers different stages in cell research from cell isolation to cell expansion and cell staining. Due to the completely reversible mechanism, which is based IBA's proprietary Strep-tag® technology, serial selection cycles followed by expansion or staining experiments are possible.

Application	Product
Cell isolation	T cell isolation with magnetic beads <ul style="list-style-type: none"> <li>› Fab-Streptamers® (receptor-specific) or</li> <li>› MHC I Streptamers® (antigen-specific)</li> </ul>
Cell expansion	CD3/CD28 Streptamers® for T cell expansion
Cell staining	MHC I Streptamers® for antigen-specific CD8 <sup>+</sup> T cell staining



The Streptamer® principle  
 (A) Multimerization & binding of target cell  
 (B) After purification, release of Strep-Tactin® upon addition of biotin  
 (C) Self-dissociation of Fab or MHC-I fragments

### The Streptamer® principle

Low affinity Strep-tagged Fab fragments or MHC molecules are employed to convey the specificity to the target cell population. In order to achieve a high binding affinity for proper cell isolation, expansion or staining, the Strep-tag® fragments bind to a multimerized Strep-Tactin®, a streptavidin derivative. Due to this a high binding avidity of the fragment is achieved.

Strep-Tactin® is available as conjugate with a magnetic microbead for magnetic cell isolation, label-free for expansion experiments or conjugated with the fluorochromes APC or PE for cell staining or FACS isolation.

Upon addition of low concentrations of biotin (Vitamin H), which competes with high affinity for the binding of Strep-tag® to Strep-Tactin®, isolation, expansion or staining reagents dissociate rapidly from the cell surface.

This reversibility enables sequential positive cell selections with magnetic beads, accurate termination of stimulation events as well as multiple cell stainings with different Strep-Tactin® fluorochromes.

### Key benefits

No high affinity antibody used! Fully reversible reagents:

- › No isolation, expansion or staining reagents remain on the cells
- › Avoid unspecific signaling events or stimulation of cells
- › Preserve authentic properties, full effector function and viability of selected cells
- › Serial positive selections of even rare cell subsets possible
- › Accurate termination of stimulation



## T CELL ISOLATION WITH MAGNETIC BEADS AND FAB STREPTAMERS®

### Receptor-specific cell selection

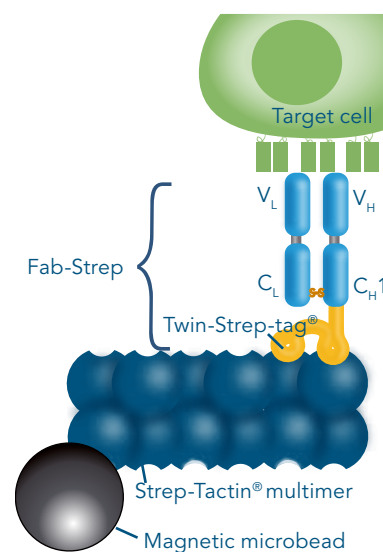
Fab Streptamer® reagents are used for receptor-specific cell isolation from PBMC and subsequent cell staining of any cells carrying a surface marker such as CD3, CD4 etc.

### Fab Streptamer® technology

Fab-Streptamers® comprise two components:

- › Low affinity Fab, which is fused to Twin-Strep-tag® (Fab-Strep)
- › Strep-Tactin® multimers labelled with a magnetic microbead

The Fab fragment confers the specificity to a certain CD marker receptor. The Twin-Strep-tag® binds to Strep-Tactin®, which is then used for isolation or staining of the target cell. For cell isolation the StrepMan magnet (cat.no 6-5650-065) is required. Upon addition of biotin, a competitive Strep-tag® ligand, the Strep-Tactin® multimer dissociates from the complex and also the Fab fragment will detach from the target cell.



Cell isolation via magnetic beads conjugated to Fab Streptamers®

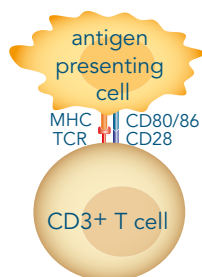
### Key benefits

- › Fully functional target cells
- › Complete dissociation of isolation reagents from purified cells
- › Serial positive selections of different markers allow isolation of even rare cell subsets
- › High purity and recovery of the target cells

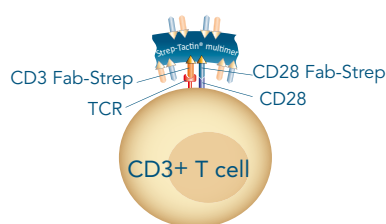
### Fab Streptamer® Product Overview

Species	Cell of Interest	Fab Streptamer® Isolation Kit	Cat. No.
human	T cells	CD3 <sup>+</sup>	6-8000-201
	T helper cells and monocytes	CD4 <sup>+</sup>	6-8000-206
	Cytotoxic T cells	CD8 <sup>+</sup>	6-8000-203
	Naive T cells	CD4 <sup>+</sup> CD45RA <sup>+</sup>	6-8000-221
		CD8 <sup>+</sup> CD62L <sup>+</sup> CD45RA <sup>+</sup>	6-8000-219
	Memory T cells	CD3 <sup>+</sup> CD45RO <sup>+</sup>	6-8000-217
		CD3 <sup>+</sup> CD62L <sup>+</sup> CD45RA <sup>-</sup>	6-8000-216
		CD3 <sup>+</sup> CD62L <sup>+</sup> CD45RO <sup>+</sup>	6-8000-212
	Memory CD4 <sup>+</sup> T cells	CD4 <sup>+</sup> CD62L <sup>+</sup> CD45RA <sup>-</sup>	6-8000-215
		CD4 <sup>+</sup> CD62L <sup>+</sup> CD45RO <sup>+</sup>	6-8000-211
	Memory CD8 <sup>+</sup> T cells	CD8 <sup>+</sup> CD62L <sup>+</sup> CD45RA <sup>-</sup>	6-8000-213
		CD8 <sup>+</sup> CD62L <sup>+</sup> CD45RO <sup>+</sup>	6-8000-210
	Regulatory T cells	CD4 <sup>+</sup> CD25 <sup>+</sup>	6-8000-205
		CD4 <sup>+</sup> CD25 <sup>+</sup> CD45RA <sup>+</sup>	6-8000-214

## CELL STIMULATION & EXPANSION (CD3/CD28)



Stimulation of T cell by two stimulatory signals



Stimulation of T cell by CD3/CD28 Streptamers® for cell expansion

The *in vitro* generation of a large number of functional T cells is important for basic research as well as for therapeutic approaches. The Streptamers® for T cell expansion are novel reagents for polyclonal expansion of T cells. They are soluble protein complexes generated by multimerization of anti-CD3 and anti-CD28 Fab-Streps with a Strep-Tactin® multimer.

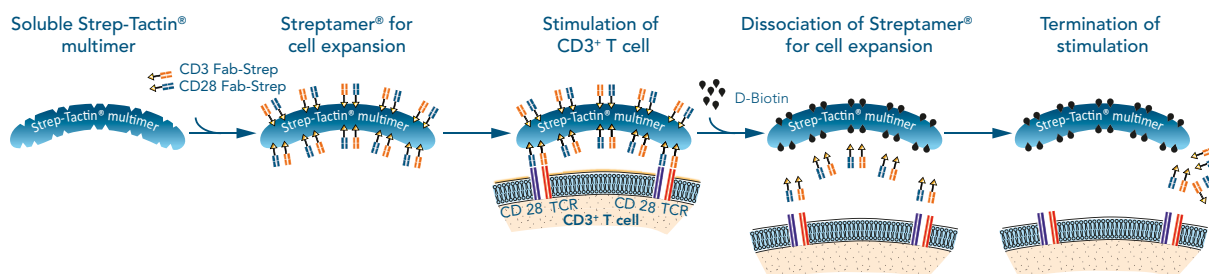
### Streptamer® expansion technology

The Streptamers® for T cell expansion are novel reagents for polyclonal expansion of T cells:

- › Soluble protein complexes generated by multimerization of αCD3- and αCD28 Fab-Streps with a Strep-Tactin® multimer
- › Completely reversible reagents, i.e. they can be removed from the cells by the addition of biotin

### Key benefits

- › Completely reversible reagents
- › Detachment from the cells at any given point in time
- › Full control about your expansion experiment
- › Adjustable CD3 : CD28 ratio
- › Non-magnetic and bead-free
- › Economic prices



Workflow of T cells activation using Streptamers® for cell expansion. After stimulation, the subsequent biotin-induced dissociation of the reagents allows an accurately defined termination of stimuli.



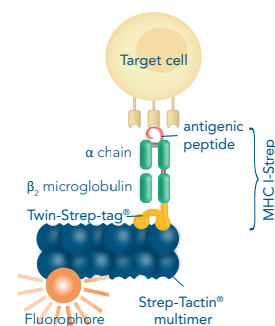
Streptamer® CD3/CD28 Kit for T cell expansion

### Products for Stimulation and Expansion of human T cells

Cat. no.	Product description
6-8900-000	Streptamer® CD3/CD28 Kit for T cell expansion
6-8901-000	Streptamer® CD3/CD28 premix for T cell expansion

## DETECTION OF ANTIGEN-SPECIFIC T CELLS WITH MHC I STREPTAMERS®

Antigen-specific CD8<sup>+</sup> T cells are stained with fluorescent MHC I Streptamers® (complex from fluorescence-labeled Strep-Tactin® and multimerized low-affinity MHC I-Streps) and are ready for e.g. flow cytometry. The subsequent removal of label with biotin preserves the authentic properties of the cells and allows unbiased downstream applications with functional, label-free cells.



Cell staining via fluorescence labeled MHC I Streptamers®

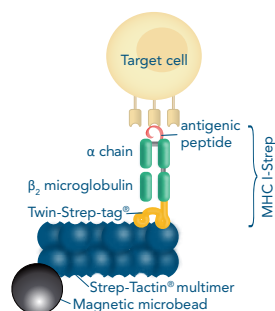
### MHC I Streptamers® technology

MHC I Streptamers® comprise two components:

- MHC I-Strep, which is an MHC I molecule fused with Twin-Strep-tag® and a specific antigenic peptide
- Strep-Tactin® multimers labeled with a fluorophore (PE or APC) or bound to magnetic microbeads

### Key benefits

- Accurate labeling and great staining intensities due to multivalent binding
- Modular products for FACS analysis and magnetic cell isolation
- Reversible reagents for full functionality of selected cells



Cell isolation via magnetic beads conjugated to MHC I Streptamers®

### MHC I Streptamers® Best sellers

Species	Research field	Allele	Antigen	Sequence	Cat. No.
human	Cytomegalovirus	HLA-A*0201	CMV pp65	NLVPMVATV	6-7001-001
		HLA-B*0702	CMV pp65	TPRVTGGGAM	6-7027-001
		HLA-A*2402	CMV pp65	QYDPVAALF	6-7028-001
		HLA-A*1101	CMV pp65	GPISGHVLK	6-7050-001
		HLA-A*0101	CMV pp50	VTEHDTLLY	6-7024-001
		HLA-B*0801	CMV IE-1	QIKVRVDMV	6-7017-001
		HLA-A*0201	CMV IE-1	VLEETSVML	6-7041-001
	Tumor	HLA-A*0201	WT-1 (Wilms tumor protein)	RMFPNAPYL	6-7019-001
		HLA-A*0201	HA-1H	VLHDDLLEA	6-7018-001
		HLA-A*0201	MART 1	ELAGIGILTV	6-7007-001
		HLA-A*0201	NY-ESO-1 (cancer testis antigen)	SLLMWITQV	6-7013-001
	Epstein-Barr virus (EBV)	HLA-A*0201	EBV BMLF-1	GLCTLVAML	6-7002-001
	Influenza	HLA-A*0201	Influenza A virus M1 protein	GILGFVFTL	6-7003-001
	HIV	HLA-A*0201	HIV-1 reverse transcriptase	ILKEPVHGV	6-7005-001
mouse	Transgenic mouse OVA model	H-2 Kb	Ovalbumin	SIINFEKL	6-7015-001

### Peptides of interest not listed above?

Visit our webpage: <https://www.iba-lifesciences.com/antigen-specific-t-cell-staining-product-shop.html>

Contact us: [info@streptamer.com](mailto:info@streptamer.com)



## AUTOMATED CELL SELECTION IN LARGE-SCALE: CELLina®

CELLina® is a fully automated large-scale cell selection device. CELLina® processes up to 100 ml whole blood, buffy coat or PBMCs and is thus suited for preparative cell selections. The closed system may be operated in a sterile manner ensuring that the label-free target cells are ready for downstream applications. In combination with CD81 Fab-Streps applied as PBMC replacement CELLina® makes time-consuming density gradient centrifugation steps obsolete.

### Contact us!



fab-tacs@iba-lifesciences.com  
streptamer@iba-lifesciences.com



+49 (0) 551 50672 - 0



[www.iba-lifesciences.com](http://www.iba-lifesciences.com)

### Get connected with us and stay updated!

