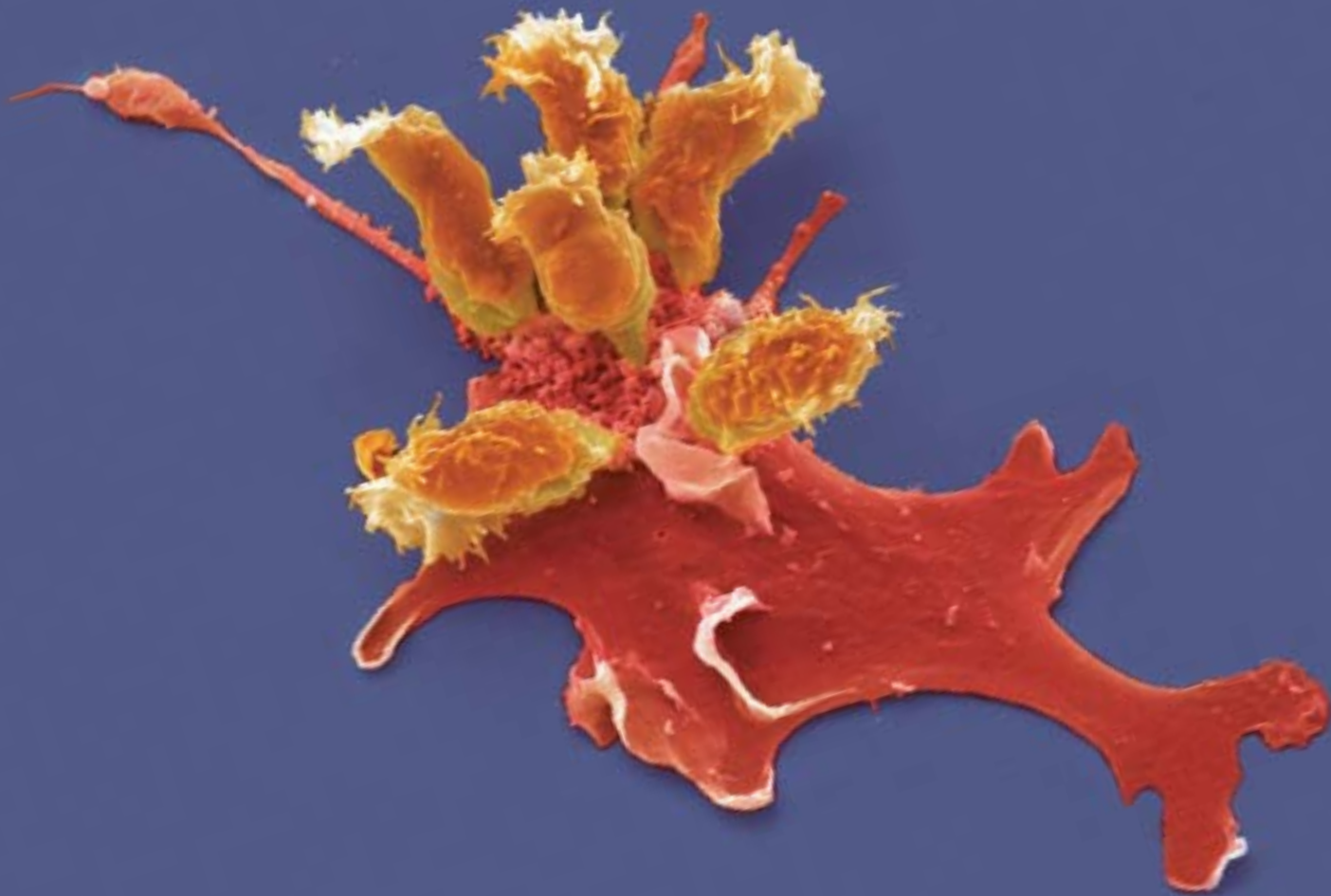


# Streptamer®

reversible staining and  
isolation of functional T-cells

**IBA**  
BioTAGnology



Cell TAGnologies®

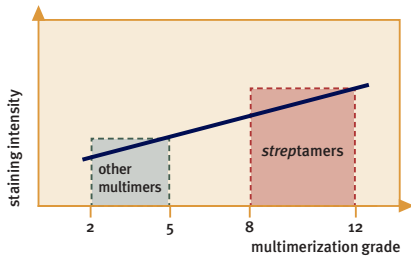
[www.streptamer.com](http://www.streptamer.com)

## Streptamer® for CD8+ T-cell staining

### Reversible, antigen-specific T-cell staining

The *Streptamer* technology is a novel method to isolate and characterize functional antigen-specific T-cells. *Streptamers* enable for the first time a reversible, antigen-specific staining of T-cells, leaving the isolated T-cells phenotypically and functionally indistinguishable from untreated cells. *Streptamer*-isolated T-cells may offer new strategies for treating incurable diseases including viral infections and cancer by adoptive T-cell transfer. In addition, the technology is likely to advance basic T-cell research as an essential prerequisite for novel immunological medicines. The technology was developed in cooperation with Dirk H. Busch, TU Munich. His experiments in mice (Knabel et al.) demonstrate that the *Streptamer* technology is capable to provide antigen-specific T-cells, which efficiently can be applied in adoptive transfer protocols.

### Multimerization grade compared to other multimer reagents

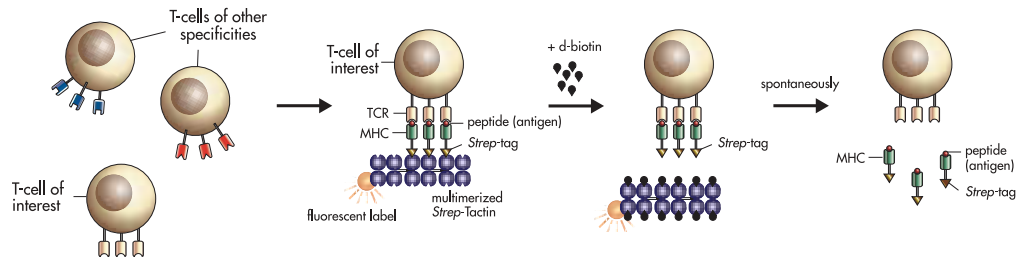


Reference: Knabel M et. al., 2002, Nature Medicine 6: 631-637.

### Fluorescent *Streptamers*

- Reversible, antigen-specific staining of T-cells
- Isolation and characterization of functional T-cells
- High staining intensities
- Mild and rapid dissociation of staining reagents using biotin
- Improved viability of T-cells after isolation
- FACS analysis with Phycoerythrin (PE) or Allophycocyanin (APC)
- FACS isolation of antigen-specific T-cells

### T-cell staining and isolation using Fluorescent *Streptamers*

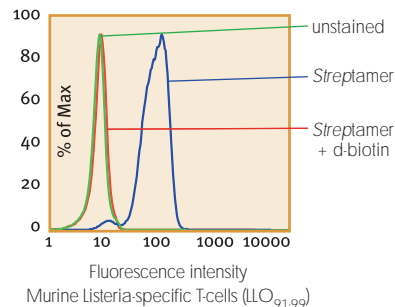


### Truly reversible staining and fully functional T-cells

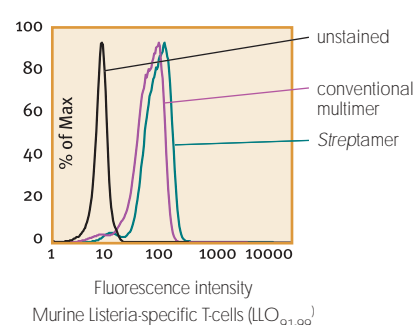
The realization of a truly reversible staining enables for the first time the collection of fully functional T-cells that are indistinguishable from untreated cells. This is in contrast to the unfavourable effects of conventional MHC multimer staining techniques, especially regarding the consequences for the outcome of adoptive T-cell transfers.

#### Full reversibility

*Streptamers* can be removed from T-cells by addition of d-biotin



#### Higher staining intensities than with other multimers



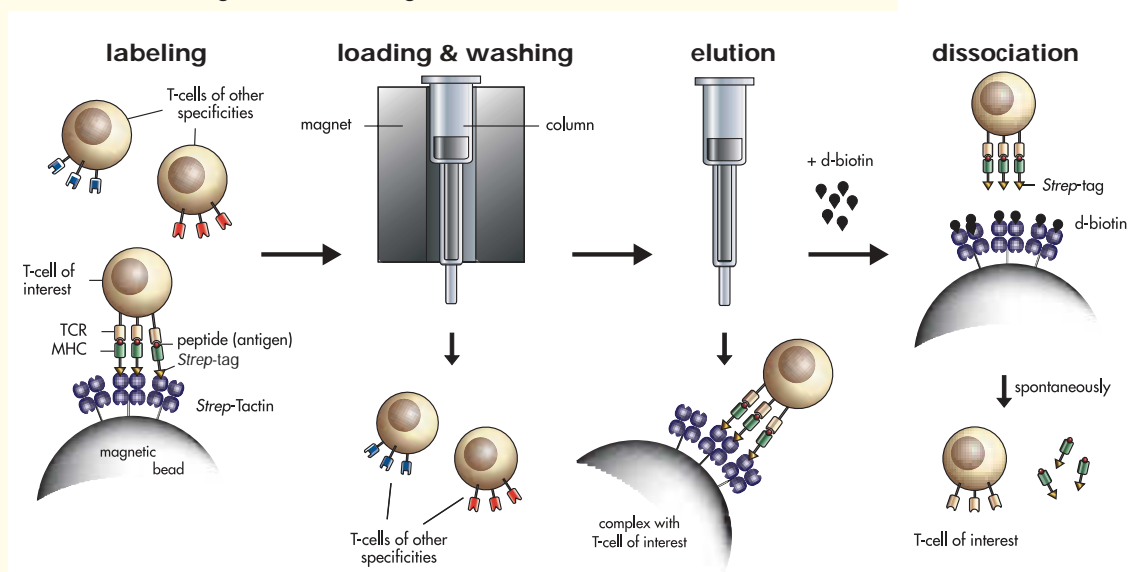
## Streptamer® for Magnet Assisted Cell Sorting

Streptamer Magnetic Beads offer a rapid and economic alternative for T-cell isolation at 4 °C under sterile conditions by Magnet Assisted Cell Sorting. Isolated T-cells can be fully dissociated from Streptamer Magnetic Beads providing an optimal tool for clinical use of T-lymphocytes.

### Streptamer Magnetic Beads for T-cell isolation

- Unique reagents for antigen-specific T-cell purification
- Rapid, sterile and preparative isolation at 4 °C enabled (4 °C prevents T-cells from entering apoptosis!)
- Purification of antigen-specific T-cells with high purities
- Full reversibility → functional T-cells
- Cost-effective alternative to FACS, since expensive instrumentation is superfluous

### T-cell isolation using Streptamer Magnetic Beads



### Several factors are important for a Streptamer T-cell isolation technique:

#### Rapid and complete dissociation at low temperatures

The extreme affinity differences between *Strep-tag*/*Strep-Tactin* and *d-biotin*/*Strep-Tactin* allow complete and very fast disassembly of the *Streptamer* complex by *d-biotin*, even at very low temperatures (preferably at 4°C).

#### Procedure is non-toxic to T-cells

*d-biotin* (vitamin H) at low concentrations, which are sufficient for *Streptamer* disassembly, is non-toxic for T-cells.

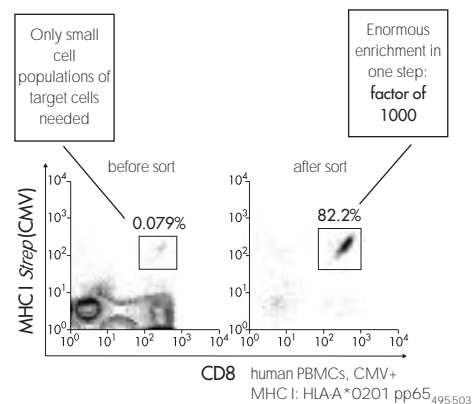
#### Substances must be harmless for (clinical) *in vivo* applications

The amounts of *d-biotin* that might be transferred with *Streptamer* isolated T-cells are far lower than *d-biotin* concentrations found in conventional vitamin supplementations and, therefore, unlikely to be harmful.

► Thus, the *Streptamer* technology provides an optimal solution for reversible, antigen-specific T-cell staining and isolation, and it represents the essential gateway for new innovative clinical applications.

### Positive selection of antigen-specific T-Lymphocytes with Streptamer Magnetic Beads

Enrichment of CMV positive T-cells

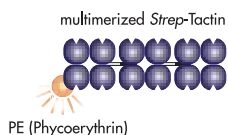


### A gateway to clinical applications

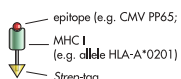
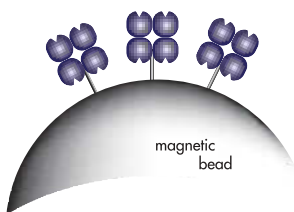
Authentic, functional, epitope-specific T-cells can now be transferred, since all labeling reagents can be removed!

**MHC II-*Strep* products available soon!**

**Strep-Tactin PE (or APC)**



**Streptamer Magnetic Beads**



**MHC I-*Strep***  
(differently optimized versions for FACS or Magnetic Beads)

**Custom services**

Products which are not available off the shelf can be synthesized as part of our custom service. We manufacture MHC I-*Strep* with the specific peptide (antigen) that you are either providing or requesting to be synthesized.

**We are looking forward to talking to you!**

Please note, that MHC I-*Strep* products are not available in North America!

**Streptamer® products & custom services**

*Streptamers* can be used to detect and isolate antigen-specific T-cells by fluorescence activated cell sorting (FACS) or magnet assisted cell sorting. For FACS applications, *Strep-Tactin* coupled to Phycoerythrin (PE) or Allophycocyanin (APC) is available, whereas for magnetic cell separation *Streptamer Magnetic Beads* are offered. MHC I-*Strep* is specifically engineered for reversible *Strep-Tactin* PE and *Strep-Tactin* APC (or *Streptamer Beads*) staining. Therefore, *Strep-Tactin* PE and *Strep-Tactin* APC (or *Streptamer Beads*) and MHC I-*Strep* have to be applied in combination. Note, that the same MHC I-*Strep* antigen can be used with either a fluorescent *Strep-Tactin* conjugate or with *Streptamer Magnetic Beads*.

**Streptamer products**

"Tests" refers to staining with fluorescently labeled *Strep-Tactin* (1 test is sufficient to stain 5x10<sup>6</sup> T-cells) while "preps" refers to T-cell purification with *Streptamer Magnetic Beads* (1 prep is sufficient to purify T-cells out of a total of 2x10<sup>7</sup> cells).

product	amount	cat. no.
<b>Strep-Tactin PE</b>		
	50 tests	6-5000-005
	150 tests	6-5000-015
	500 tests	6-5000-050
<b>Strep-Tactin APC</b>		
	50 tests	6-5010-005
	150 tests	6-5010-015
	500 tests	6-5010-050
<b>Streptamer Magnetic Beads</b>		
	5 preps	6-5500-005
	25 preps	6-5500-025
	75 preps	6-5500-075
<b>Solution Set for Streptamer Magnetic Beads</b>		
	5 preps	6-5600-005
	25 preps	6-5600-025
	75 preps	6-5600-075
<b>MHC I-<i>Strep</i> HLA-A*0201; viral antigens</b>		
<b>CMV PP65; NLVPMVATV</b>		
	50 tests/25 preps	6-7001-005
	150 tests/75 preps	6-7001-015
	500 tests/250 preps	6-7001-050
<b>EBV; GLCTLVAML</b>		
	50 tests/25 preps	6-7002-005
	150 tests/75 preps	6-7002-015
	500 tests/250 preps	6-7002-050
<b>Influenza M; GILGFVFTL</b>		
	50 tests/25 preps	6-7003-005
	150 tests/75 preps	6-7003-015
	500 tests/250 preps	6-7003-050
<b>HIV gag; SLYNTVATL</b>		
	50 tests/25 preps	6-7004-005
	150 tests/75 preps	6-7004-015
	500 tests/250 preps	6-7004-050
<b>HIV pol; ILKEPVHGV</b>		
	50 tests/25 preps	6-7005-005
	150 tests/75 preps	6-7005-015
	500 tests/250 preps	6-7005-050
<b>HBV core; FLPDFFPSV</b>		
	50 tests/25 preps	6-7006-005
	150 tests/75 preps	6-7006-015
	500 tests/250 preps	6-7006-050
<b>MHC I-<i>Strep</i> HLA-A*0201; cancer related antigens</b>		
<b>MART 1; ELAGIGILTV</b>		
	50 tests/25 preps	6-7007-005
	150 tests/75 preps	6-7007-015
	500 tests/250 preps	6-7007-050

product	amount	cat. no.
<b>Her-2/neu; KIFGSLAFL</b>		
	50 tests/25 preps	6-7008-005
	150 tests/75 preps	6-7008-015
	500 tests/250 preps	6-7008-050
<b>Her-2/neu; RLLQETELV</b>		
	50 tests/25 preps	6-7009-005
	150 tests/75 preps	6-7009-015
	500 tests/250 preps	6-7009-050
<b>Gp100; IMDQVPFSV</b>		
	50 tests/25 preps	6-7010-005
	150 tests/75 preps	6-7010-015
	500 tests/250 preps	6-7010-050
<b>Gp100; ITDQVPFSV</b>		
	50 tests/25 preps	6-7011-005
	150 tests/75 preps	6-7011-015
	500 tests/250 preps	6-7011-050
<b>Tyrosinase; YMDGTMSQV</b>		
	50 tests/25 preps	6-7012-005
	150 tests/75 preps	6-7012-015
	500 tests/250 preps	6-7012-050
<b>NY-ESO-1; SLLMWITQV</b>		
	50 tests/25 preps	6-7013-005
	150 tests/75 preps	6-7013-015
	500 tests/250 preps	6-7013-050
<b>MHC I-<i>Strep</i> H-2 K<sup>d</sup>; mouse models</b>		
<b>LLO 91-99; GYKDGNEYI</b>		
	50 tests/12.5 preps	6-7014-005
	150 tests/37.5 preps	6-7014-015
	500 tests/125 preps	6-7014-050
<b>MHC I-<i>Strep</i> H-2 K<sup>b</sup>; mouse models</b>		
<b>Ovalbumin; SIINFEKL</b>		
	50 tests/12.5 preps	6-7015-005
	150 tests/37.5 preps	6-7015-015
	500 tests/125 preps	6-7015-050
<b>MHC I-<i>Strep</i> H-2 D<sup>b</sup>; mouse models</b>		
<b>Gp33-LCMV; KAVYNFATM</b>		
	50 tests/12.5 preps	6-7016-005
	150 tests/37.5 preps	6-7016-015
	500 tests/125 preps	6-7016-050

® Streptamer is a trademark of IBA GmbH.

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