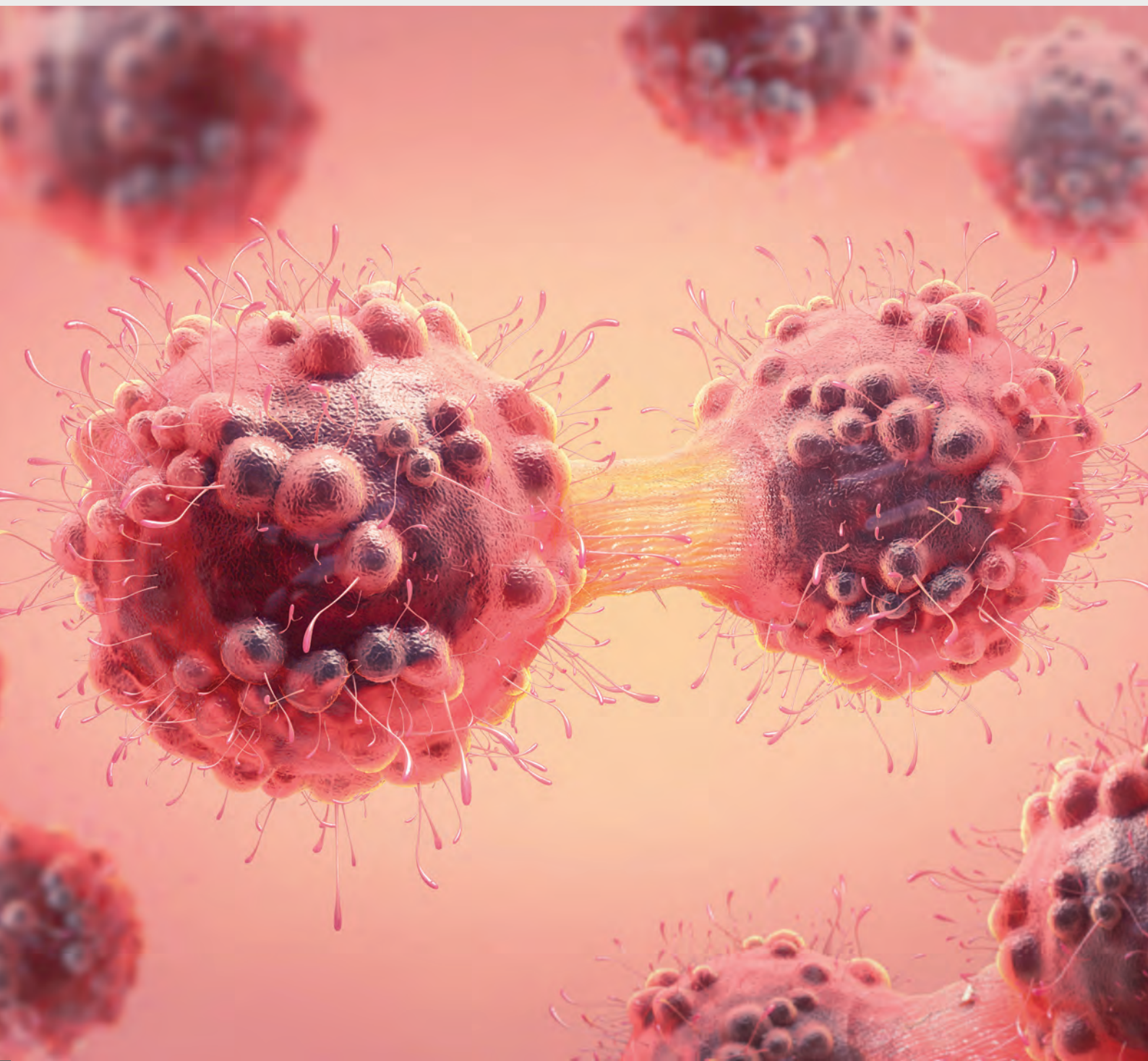




# Immuno-Oncology

Innovative Tools for  
Immuno-Oncology Research



[enzolifesciences.com](http://enzolifesciences.com)



# UNDERSTANDING IMMUNE CHECKPOINTS IN IMMUNOLOGY AND CANCER

At Enzo, we offer a complete set of solutions for immuno-oncology research including antibodies, ELISA kits, and recombinant proteins. Our diverse scientific and technical expertise has helped us create innovative assays and reagents to help support immuno-oncology research. We provide flexible and validated tools to help you generate reliable and consistent results.

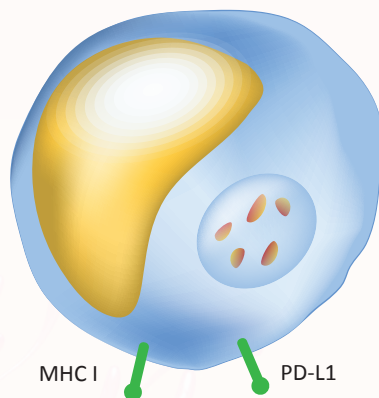
## TNF Superfamily Ligands

TRAIL™ Protein and Ligands  
KILLERTRAIL™ Ligands  
SUPERKILLERTRAIL® Ligands  
SUPERFASLIGAND® Protein  
FasL Monoclonal Antibodies  
TNF- $\alpha$  Antibodies

## Recombinant Proteins

PD-1  
PD-L1  
OX40  
OX40L

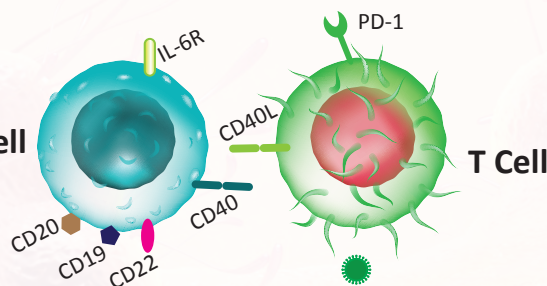
## Tumor Cell



## Bacterial Toxins

*C. difficile* toxoid A  
*C. difficile* toxoid B  
Tetanus toxoid

## B Cell



## T Cell

## Dendritic Cell

## Key TLR Ligands

Purified Native Ligands  
TLRGRADE™ LPS & Lipid A  
MEGACD40L® Protein

## Highly Sensitive ELISAs

Interleukins  
Cytokines  
Hormones

## Antibodies

CD Markers, 14-3-3, LAG-3,  
Calcineurin, FasL, GITR,  
OX40L, PD-1, PD-L1, TIM-3

## Superior Ligands & Toxins

Accelerate your immuno-oncology research by using our enhanced TNF and TLR ligands. Additionally, we offer ultrapure LPS, lipid A reagents, and bacterial toxins. We provide high quality, pure, and consistent reagents specifically designed for your immune system activation research.

## Immunoassay Kits

Our catalog of nearly 300 ELISA kits includes sensitive, specific assays for relevant markers of cell viability, signaling pathways, steroid and peptide hormones, inflammation, and more. In addition to traditional antibody pair based immunometric assays, our scientists specialize in the particularly challenging production of high specificity competitive ELISAs for detection of small molecules. With 40 years of assay development experience and state-of-the art manufacturing facilities, Enzo ensures time-tested reproducibility.

## Cell-Based Assays

Our CELLESTIAL® portfolio of fluorescent probes and assay kits for cellular analysis provides a complete set of tools for monitoring cell viability, proliferation, death, oxidative stress and toxicology. Our dye-based assays have been optimized for the most demanding imaging applications including confocal microscopy, wide-field fluorescence microscopy, flow cytometry, and high content screening, where consistency and reproducibility are essential.

# ACCELERATE YOUR IMMUNE ACTIVATION STUDIES

## Key Toll-like Receptor Ligands

TLRs play a role in the innate immune system, detecting pathogen-associated molecule patterns (PAMPs) of bacterial, viral, fungal, and protozoal origin.

KEY TOLL-LIKE RECEPTOR LIGANDS					
TLR	Ligands	Product #	TLR	Ligands	Product #
TLR1/TLR2	Pam <sub>3</sub> Cys-Ser-(Lys) <sub>4</sub> trihydrochloride	ALX-165-066	TLR5	Flagellin (high purity)	ALX-522-058
TLR2/TLR6	MALP-2	ALX-162-027	TLR7/TLR8	R-848	ALX-420-038
TLR3	Polyinosinic-polycytidylic acid, potassium salt (TLRGRADE™) (synthetic)	ALX-746-021	TLR9	ODN 1668 (TLRGRADE™) (synthetic)	ALX-746-001
TLR4	LPS from <i>E. coli</i> , Serotype O55:B5 (TLRGRADE™)	ALX-581-013		ODN 1826 (TLRGRADE™) (synthetic)	ALX-746-002
	Lipid A from <i>E. coli</i> , Serotype R515 (Re) (TLRGRADE™)	ALX-581-200		ODN 2006 (TLRGRADE™) (synthetic)	ALX-746-006
	Monophosphoryl Lipid A (synthetic)	ALX-581-205		ODN 2216 (TLRGRADE™) (synthetic)	ALX-746-005
	Paclitaxel	BML-T104	TLR11	Profilin ( <i>Toxoplasma gondii</i> ), (recombinant) (GST-tag)	ALX-522-093

## Co-Stimulation of T Cell Response

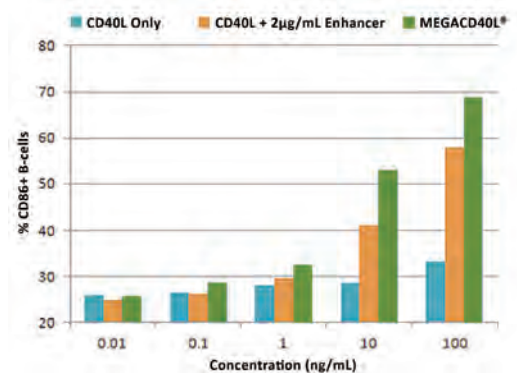
### Superior Performance from Carefully Engineered TNF Superfamily Ligands

#### MEGACD40L® Protein (soluble) (human), (recombinant) (ALX-522-110)

- Improved stability and enhanced activity, when compared to CD40L alone or with enhancers
- Guarantees reliable results through consistent lot-to-lot performance

RELATED PRODUCTS	
Product Name	Product #
CD40 (human):Fc (human), (recombinant)	ALX-522-016
CD40L (soluble) (human), (recombinant)	ALX-522-015
CD40L (soluble) (mouse), (recombinant)	ALX-522-070
Enhancer for Ligands	ALX-804-034
Fc (human):CD40L (soluble) (human), (recombinant)	ALX-522-076
MEGACD40L® (soluble) (mouse), (recombinant)	ALX-522-120

### Enhance Immune Activation with MEGACD40L® Protein



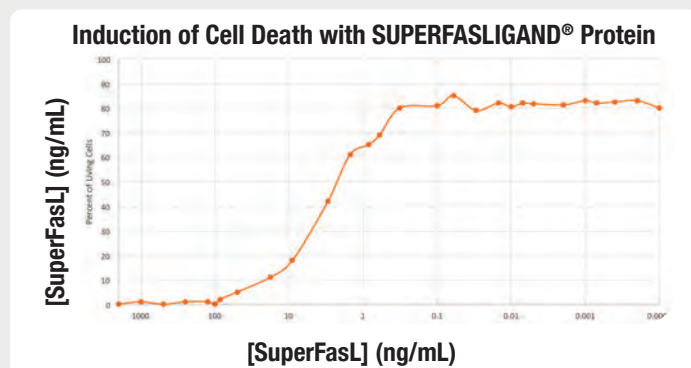
B cell lymphocyte activation by various CD40L constructs. PBMCs were treated for 48 hrs in media containing serially diluted CD40L, CD40L + 2 µg/mL Enhancer, or MEGACD40L® Protein. Cells were dual-stained with α-human CD19-PE and α-human CD86-APC and analyzed by flow cytometry. Data are presented as the percent of CD19+ B cells that co-stain as CD86+.

## Death Receptor Ligands

Members of the tumor necrosis factor (TNF) receptor gene superfamily bind to extrinsic ligands and transduce intracellular signals leading to the destruction of the cell. Ligands, such as FasL and TNF-α, hold potential as targets for therapeutic and diagnostic applications.

#### SUPERFASLIGAND® Protein (soluble)(human), (recombinant) (ALX-522-020)

- Features an N-Terminus linker shown to improve stability
- Enhanced immune activation compared to other recombinant ligands
- Mimics glycosylation of native human FasL



Jurkat cells were incubated with the indicated concentration of SuperFasL and cell proliferation was assayed. % Viability was determined in comparison to control wells with no SuperFasL.

RELATED PRODUCTS	
Product Name	Product #
FasL [CD95L,CD178] (soluble) (human), (recombinant)	ALX-522-001
Fc (h):TNF-α (soluble) (human), (recombinant)	ALX-522-087
KILLERTRAIL™ Protein (soluble) (human), (recombinant)	ALX-201-073
SUPERKILLERTRAIL® Protein (soluble) (human), (recombinant)	ALX-201-115
SUPERKILLERTRAIL® Protein (soluble) (human), (recombinant)	ALX-201-130
TNF-α (human) (recombinant), (cell culture grade)	ALX-520-002
TNF-α (soluble) (human), (recombinant)	ALX-522-008
TRAIL (soluble) (human), (recombinant)(His-tag)	BML-SE721
TRAIL (soluble) (mouse), (recombinant)	BML-SE722



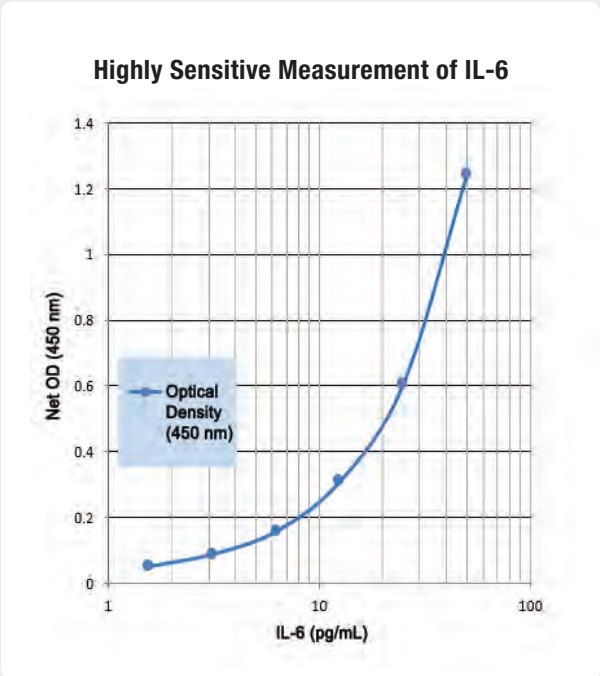
# QUANTIFY BIOMARKERS OF INFLAMMATION WITH ELISA KITS

## High-Specificity ELISAs for Innate and Adaptive Immune Research

We offer a large variety of immunoassay kits in both immunometric and competitive assay formats. As scientists and manufacturers of kits, we understand the critical nature of your research. Each kit is put through rigorous testing to ensure high precision, accuracy, sensitivity, and specificity. You can be confident that you will obtain reproducible results, day-after-day, and lot-after-lot.

- **Sensitivity** – detect even the lowest sample concentration
- **Broad Range** – minimize need for dilution
- **Consistent** – strict quality control guidelines ensure reproducible results, lot-after-lot
- **Trusted** – reliability highlighted in peer-reviewed publications for four decades
- **Flexible** – wide range of sample types

CYTOKINE/INTERLEUKIN ELISAs				
Human			Mouse	
Adiponectin	IL-4	Leptin	IFN-γ	Leptin
CD40	IL-6	Lipocalin 2 (NGAL)	IL-1β	Lipocalin 2 (NGAL)
CD40L	IL-8	Nampt	IL-2	Nampt
FasL	IL-10	Osteoprotegerin	IL-4	TGF-β1
IFN-γ	IL-12p70	RANKL	IL-6	TNF-α
IGF-1	IL-13	TNF-α		
IL-1β	IL-17A	TNF-R1		
IL-2	IL-33			

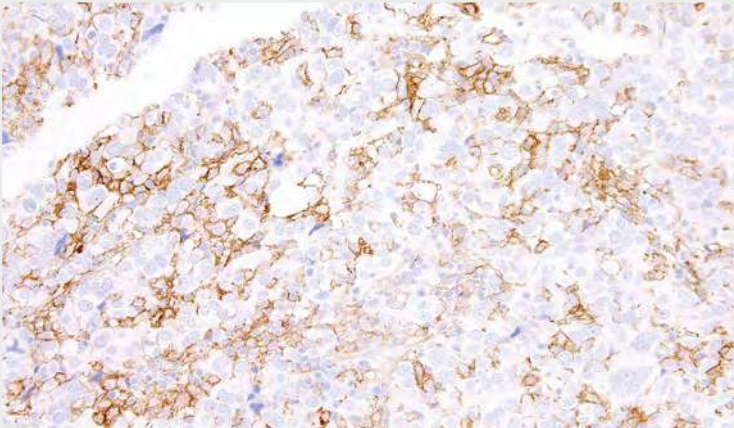


A typical standard curve for IL-6 (human) High Sensitivity ELISA kit (ENZ-KIT178)

## Immune Checkpoints

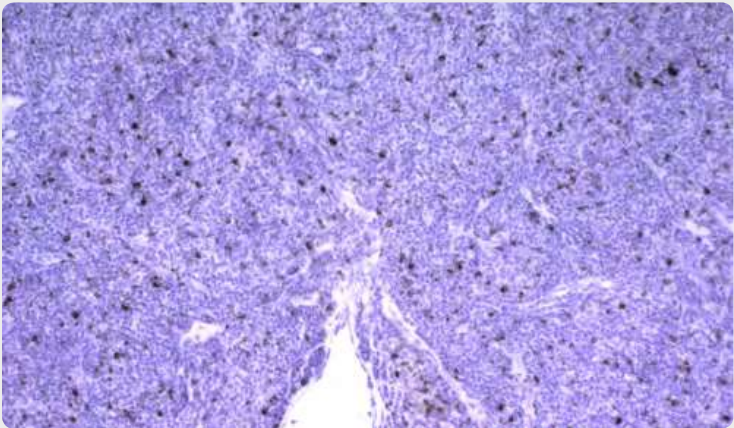
Highly specific antibodies validated for various applications, from flow cytometry to IHC, help you discover immune checkpoint inhibitors, develop novel immunotherapies, and support your immuno-oncology research. **For more information, go to: [www.enzolifesciences.com/antibodies](http://www.enzolifesciences.com/antibodies)**

PD-L1 (human) mAb (ENZ-ABS693)



IHC using anti-PD-L1 on lung adenocarcinoma tissue.

LAG-3 (human) mAb (ENZ-ABS677)












IHC using anti-LAG-3 on human tonsil tissue.

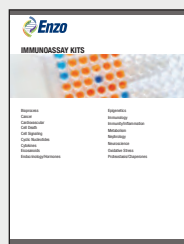
# HIGH QUALITY ANTIBODIES DELIVER SUPERIOR RESULTS

## Detect Specific Cell Populations with Antibodies for CD Markers

Enzo offers over 50 CD antibodies validated for flow cytometry and microscopy applications.

CD Marker	T Cells	B Cells	Dendritic Cells	NK Cells	Stem Cell Precursor	Macrophages	Granulocytes	Endothelial Cells	Epithelial Cells
									
CD3	•								
CD4	•					•	•		
CD8	•			•					
CD9	•	•				•	•	•	•
CD11a	•	•		•		•	•		
CD18	•	•	•	•		•	•		
CD20	•	•							
CD23	•	•	•			•	•		•
CD31	•	•		•		•	•	•	
CD38	•	•	•	•	•	•			
CD39	•	•	•	•		•		•	•
CD40	•	•	•		•	•	•	•	•
CD40L	•								
CD41a					•				
CD41b					•				
CD42					•				
CD44	•	•		•		•	•	•	•
CD45	•	•	•	•	•	•	•		
CD45RA	•	•	•	•	•	•			
CD49b/CD29	•	•	•	•	•	•	•	•	•
CD51						•		•	
CD52	•	•		•					•
CD54	•	•				•		•	
CD66a							•		•
CD66b							•		
CD66c							•		•
CD66e									•
CD68	•	•	•		•	•	•		
CD74	•	•	•			•		•	•
CD80	•	•	•			•			
CD83		•	•						
CD87	•			•		•	•	•	
CD107b	•						•	•	
CD123			•		•		•	•	
CD127	•				•	•			
CD134L	•								
CD163						•			
CD194	•		•	•		•		•	
CD205		•	•			•			
CD207			•						
CD208			•						
CD223	•			•	•				
CD243					•				
CD279	•								
CD324					•				•
CD325					•				

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Our broad range of scientific expertise and manufacturing capabilities enables us to provide innovative tools for immuno-oncology research to save you time and money!