ANTIBODIES, KITS, AND REAGENTS FOR THE STUDY OF
CANCER IMMUNOLOGY
CST has antibodies, kits, and reagents for each stage of the experimental process.

**Primary Antibodies**
Over 1000 unconjugated and directly conjugated primary antibodies directed against more than 250 targets relevant to immunology and cancer immunology. The collection is continually expanding, so please check our website frequently for a complete, up-to-date list.

[www.cellsignal.com/immuno_newproducts](http://www.cellsignal.com/immuno_newproducts)

**Kits**

**Antibody Sampler Kits and Antibody Array Kits:** provide a cost-effective way for analyzing multiple nodes in a pathway of interest or modification sites within a protein of interest.

**Immunohistochemistry Kits:** include IHC validated antibodies and signal enhancing companion products to bolster sensitivity of target detection.

**ELISA Kits:** allow for specific analyte detection that enables simple high-throughput analysis.

**Chromatin IP Kits and Reagents:** include SimpleChIP® and SimpleChIP® Plus kits, ChIP validated antibodies, control PCR primers, and companion products needed to perform successful ChIP assays.

**PTMScan® Kits and Services:** utilize motif antibodies and LC-MS/MS technology to generate quantitative profiles of hundreds to thousands of proteins containing a particular type of post-translational modification.

**Experimental Controls**

**Isotype controls:** control antibodies that are used to estimate non-specific binding of test primary antibodies due to Fc receptor binding and other protein-protein interactions.

**SignalSlide® IHC controls:** slides with formalin fixed paraffin embedded cell pellets that are verified to either express (positive control) or lack (negative control) the target of interest.

**SignalSilence® siRNA:** rigorously validated siRNAs that can be used to selectively reduce the expression of a target of interest.

**Blocking Peptides:** synthetic peptides that specifically bind the antibody against which they were designed and block further antibody binding, confirming antibody specificity and eliminating concerns about non-specific binding.

**Companion Products**

Secondary antibodies (conjugated to Alexa Fluor®, DyLight™ series, PE, Pacific Blue™, HRP and others), loading controls, buffers, dyes, detection reagents, protease and phosphatase inhibitors, and peptide substrates are available to support your workflow.

**Chemical Modulators**

Growth factors and cytokines can be used for treatment of cells in order to stimulate or inhibit activation, phosphorylation, proliferation, and differentiation events.

**Custom Products**

Our customs department will work with you if you require a product in a specific size, conjugation format, or formulation for your particular assay platform, or if you need a product validated for a specific measure or assay.
IF and IHC validated antibodies to assess the subcellular localization and spatial context of key immune cell targets

Stat1 (D1K9Y) Rabbit mAb #14994: Confocal IF analysis of HeLa cells serum-starved overnight (left) or treated with Human Interferon-α1 (hIFN-α1) #9827 (1,000 units/ml, 30 min; right), using #14994 (green) and β-Actin (8H10D10) Mouse mAb #3700 (red).

OX40 (Alexa Fluor® 488 Conjugate) #15135:
Flow cytometric analysis of human PBMCs, untreated (left) or PHA-treated (1 μg/ml, 48 hr, 37ºC; right), using #15135, which recognizes the intracellular domain of human OX40, and co-stained with an anti-human CD4 antibody.

CD40L (D5J9Y) Rabbit mAb #15094:

Flow Cytometry validated antibodies to allow for simultaneous detection of surface and intracellular targets

OX40 (D156L) Rabbit mAb (Alexa Fluor® 488 Conjugate) #15135S: Flow cytometric analysis of human PBMCs, untreated (left) or PHA-treated (1 μg/ml, 48 hr, 37ºC; right), using #15135S, which recognizes the intracellular domain of human OX40, and co-stained with an anti-human CD4 antibody.

ChIP validated antibodies and kits to examine protein-DNA interactions

SignalSilence® IRAK1 siRNA I #6253:
WB analysis of extracts from HeLa cells, transfected with 100 nM SignalSilence® Control siRNA (Unconjugated) #6656 (-) or #6253 (+) using IRAK1 (D51G7) XP® Rabbit mAb #4504 (upper) or α-Tubulin (11H10) Rabbit mAb #2125 (lower). The IRAK1 (D51G7) XP® Rabbit mAb confirms silencing of IRAK1 expression, while the α-Tubulin (11H10) Rabbit mAb is used as a loading control.

SignalSilence® PD-L1 siRNA I #6257:
WB analysis of extracts from HeLa cells, transfected with 100 nM SignalSilence® Control siRNA (Unconjugated) #6656 (-) or #6257 (+) using PD-L1 (E1L3N®) XP® Rabbit mAb #13684 (upper) or α-Tubulin (11H10) Rabbit mAb #2125 (lower). The PD-L1 (E1L3N®) XP® Rabbit mAb confirms silencing of PD-L1 expression, while the α-Tubulin (11H10) Rabbit mAb is used as a loading control.

Experimental controls to help assess assay performance

SignalSlide® PD-L1 IHC Controls #13747: IHC analysis of paraffin-embedded HDLM-2 (PD-L1 positive, left) and PC3 (PD-L1 negative, right) cell pellets using PD-L1 (E1L3N®) XP® Rabbit mAb #13684.
A successful immune response requires a refined balance of co-stimulatory and co-inhibitory inputs (see table, top left), which ensure detection and clearance of foreign material while staving off self-recognition. Fine-tuning this response, at least in part, involves regulation of T-cell function, which is governed by the activation of the T-cell receptor (TCR).

Immune checkpoint proteins belonging to the B7 family (B7-1, B7-2, B7-H1, B7-DC, B7-H3, B7-H4, HHLA, and others) are largely responsible for imposing negative inputs, which mitigate T-cell function post TCR activation. Tumor cells often evade immune detection by co-opting the inhibitory signaling axes, which normally hinder TCR activation. This is manifested as the upregulated expression of immune checkpoint ligands, such as PD-L1, PD-L2, and others, on the tumor cell surface. The binding of these ligands to corresponding receptors on T-cells acutely attenuates T-cell activation or response.

IHC validated antibodies to enable detection of immune checkpoint proteins in the context of three-dimensional tissue architecture

Flow Cytometry validated antibodies to detect co-expression of surface and intracellular targets and allow for phenotypic characterization
**STING**

Stimulator of interferon genes (STING) is a key signaling molecule within the innate arm of the immune response, which enables detection of microbial as well as tumor-derived nucleic acids in the cytosol. Disruption of immune checkpoint pathways involving CTLA-4 and PD-1 is found to be therapeutically ineffective in mouse models lacking STING, indicating that activation of the STING pathway may be important for anti-neoplastic therapies involving checkpoint blockade.


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**Innate Immunity Target List**

For a complete product listing, including our expansive portfolio of modification-specific antibodies please visit our website. The targets in bold text are featured in this brochure.
Toll-like receptors (TLRs) recognize distinct pathogen-associated molecular patterns (PAMPs) and play an integral role in the innate immune response. They participate in the first line of defense against invading pathogens and play a significant role in inflammation, immune cell regulation, survival, and proliferation. Recent studies indicate that TLR expression is not restricted to cells of immune origin and that tumor cells can also bear functional TLRs suggesting they play a role in tumor immunogenicity. The modulation of the inflammatory response by TLRs is a key factor in tumor development and progression, triggering both tumor-promoting and anti-tumor responses.
Cell Signaling Technology (CST) is a private, family-owned company, founded by scientists and dedicated to providing high quality research tools to the biomedical research community. Our employees operate worldwide from our U.S. headquarters in Massachusetts, and our offices in the Netherlands, China, and Japan.