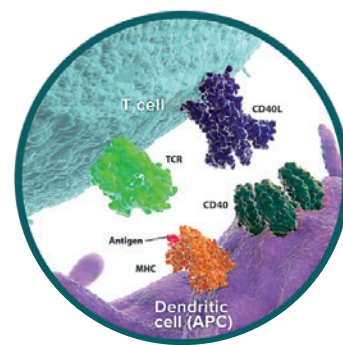


CD40 – CD40L Signaling Pathway

The CD40-CD40L (CD154) signaling pathway is a pivotal regulator of adaptive immunity, bridging innate and adaptive responses. CD40, a member of the TNF receptor superfamily, is expressed on antigen-presenting cells (APCs) such as dendritic cells, macrophages and B cells, while its ligand CD40L is transiently expressed on activated CD4⁺ T cells. Engagement of CD40 by CD40L drives a cascade of immune-activating events. In dendritic cells and macrophages, CD40 signaling enhances antigen presentation, cytokine secretion and upregulation of co-stimulatory molecules. In B cells, CD40-CD40L interactions promote germinal center formation, isotype switching and the generation of long-lived plasma cells and memory B cells. Interaction between CD40-CD40L stimulates cytokines secretion of B cells with subsequent T cell activation and antitumor immunity.



SELECTED REFERENCES: CD40 stimulation as a molecular adjuvant for cancer vaccines and other immunotherapies: T.N.J. Bullock; Cell. Mol. Immunol. **19**, 14 (2022) • Co-stimulators CD40-CD40L, a potential immune-therapy target for atherosclerosis: A review: S. Tian, et al.; Medicine **103**, e37718 (2024) • Soluble CD40 Ligand as a Promising Biomarker in Cancer Diagnosis: A. Pazoki, et al.; Cells **13**, 1267 (2024) • Facts and Hopes of CD40 Agonists in Cancer Immunotherapy: J.C. McVey & G.L. Beatty; Clin. Cancer Res. **31**, 2079 (2025) • The role of soluble CD40L in autoimmune diseases: M. Mabrouk, et al.; J. Transl. Autoimmun. **10**, 100288 (2025)

Highly Sensitive ELISA Assay & Validated Proteins/Antibodies

ASSAYS	PID	SIZE	SENSITIVITY	RANGE	SPECIES
CD40L (human) ELISA Kit	AG-45B-0018	96 wells	20 pg/ml	0.03125 to 2 ng/ml	Hu
PROTEINS	PID	SIZE	SOURCE	ENDOTOXIN	SPECIES
CD40 (human):Fc (human) (rec.)	AG-40B-0083	50 µg 3 x 50 µg	HEK 293 cells	<0.01EU/µg	Hu, Ms
CD40 (human):Fc (human) (rec.)	CHI-HF-210CD40	100 µg	CHO cells	<0.06EU/µg	Hu
CD40 (human)-mulg Fusion Protein	ANC-504-020	25 µg	CHO cells	n.d.	Hu
CD40L (human) (multimeric) (rec.)	AG-40B-0010	10 µg 3 x 10 µg	CHO cells	<0.01EU/µg	Hu
CD40L (human) (multimeric) (rec.) (CSG)	AG-40B-0010CSG	100 µg	CHO cells	<0.01EU/µg	Hu
B-Xpander™ CD40L (human) (multimeric) (rec.)	AG-40B-0010AF	10 µg 100 µg	CHO cells	<0.01EU/µg	Hu
CD40L (human):Fc (human) (rec.)	CHI-HF-210CD40L	50 µg	CHO cells	<0.06EU/µg	Hu
CD40L (human)-muCD8 Fusion Protein	ANC-505-020	25 µg	CHO cells	n.d.	Hu
CD40L (mouse) (multimeric) (rec.)	AG-40B-0020	10 µg 3 x 10 µg	CHO cells	<0.01EU/µg	Hu, Ms
CD40L (rat) (multimeric) (rec.)	AG-40B-0107	10 µg 3 x 10 µg	CHO cells	<0.02EU/µg	Hu, Ms, Rt
ANTIBODIES	PID	SIZE	ISOTYPE	APPLICATION	SPECIES
anti-CD40 (human), mAb (BE-1)	ANC-189-020	100 µg	Mouse IgG1	FACS, FUNC, IP	Hu
anti-CD40 (human), mAb (EA-5)	ANC-300-020	100 µg	Mouse IgG1	FACS, FUNC	Hu, Rt
anti-CD40L (human), mAb (rec.) (blocking) (hu5c8) (PF)	AG-27B-6002PF	100 µg	Human IgG1κ	FUNC, WB	Hu, Dog
anti-CD40L (human), mAb (24-31)	ANC-353-020	100 µg	Mouse IgG1	FACS, FUNC, IHC, WB	Hu, Primate
anti-CD40 (mouse), mAb (FGK45) (PF)	AG-20B-0036PF	100 µg 500 µg 5 mg	Rat IgG2a	FACS, FUNC	Ms

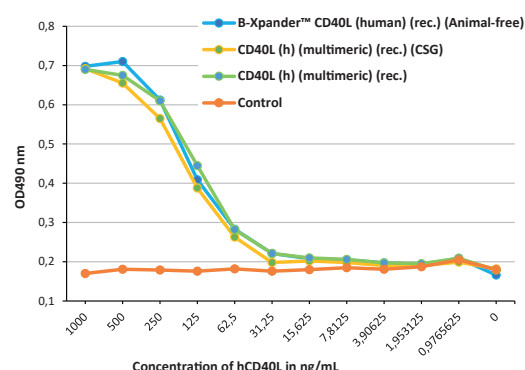
See Backcover for Potent B Cell Expansion Tools

B-Xpander™ – Unleash the Power of B Cell Expansion

CD40 activation tools can be used to expand B cells which, as antigen-presenting cells (APCs), are as effective as dendritic cells to streamline the generation of antitumor CD8⁺ T cells. Several studies show that usage of the agonistic anti-CD40 antibodies or MultimericCD40L proteins (e.g. B-Xpander™) are strong stimulators of antitumor immunity. Interest in B cells has recently increased in Immunotherapies using Engineered B cells or Tumor-Infiltrating Lymphocytes (TILs). Our B-Xpander™ protein improves current protocols for B cell stimulation by mimicking the natural interaction between CD40L and CD40 molecules on B cells. B-Xpander™ is a potent enhanced Multimeric human CD40L cytokine, for B cell activation, B cell expansion (proliferation) and cell therapy applications.

Potent B Cell Expansion (Proliferation)

FIGURE: B-Xpander™ increases proliferation of human primary CD19⁺ B cells as efficiently as other grades of Multimeric human CD40L. Unlike most recombinant CD40L proteins on the market, our B-Xpander™ and Multimeric CD40L proteins do not need an enhancer (antibody) to multimerize and to be active.



B-Xpander™ and Multimeric human CD40L Grades for your experiments

MULTIMERIC PROTEINS	PID	APPLICATIONS
B-Xpander™ CD40L (human) (multimeric) (rec.)	AG-40B-0010AF	Produced using animal component-free medium in characterized and certified CHO cells (<i>Ex vivo</i> / Cell Therapy).
CD40L (human) (multimeric) (rec.) (CSG)	AG-40B-0010CSG	Produced using certified serum/medium in CHO cells for traceability (<i>Ex vivo</i> / Cell Therapy or Research Use).
CD40L (human) (multimeric) (rec.)	AG-40B-0010	Produced using standard serum/medium in CHO cells (RUO).

Potent Antibody-based B Cell Stimulation

Widely used stimulatory monoclonal antibody to CD40 which activates B and NK cells *in vivo* and *in vitro*. This antibody has shown to indirectly activate natural killer (NK) cells, producing significant antitumor and antimetastatic effects. It is effective in boosting immune responses against infectious agents and can potentially be used to treat chronic autoimmune inflammatory processes.

anti-CD40 (mouse), mAb (FGK45)

AG-20B-0036

AG-20B-0036PF Preservative Free

100 µg | 500 µg
100 µg | 500 µg | 5 mg

FIGURE: Systemic immune activation by CD40 ligation. Mice were sacrificed on day 8 after daily treatment on day 4-7 with FGK45 or control. FGK45 treatment elevated splenocyte numbers in both groups. *P < 0.005. Data represent mean ± SD for three to four mice per group.

