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## Featured TNF Signal Pathway Related Protein Products

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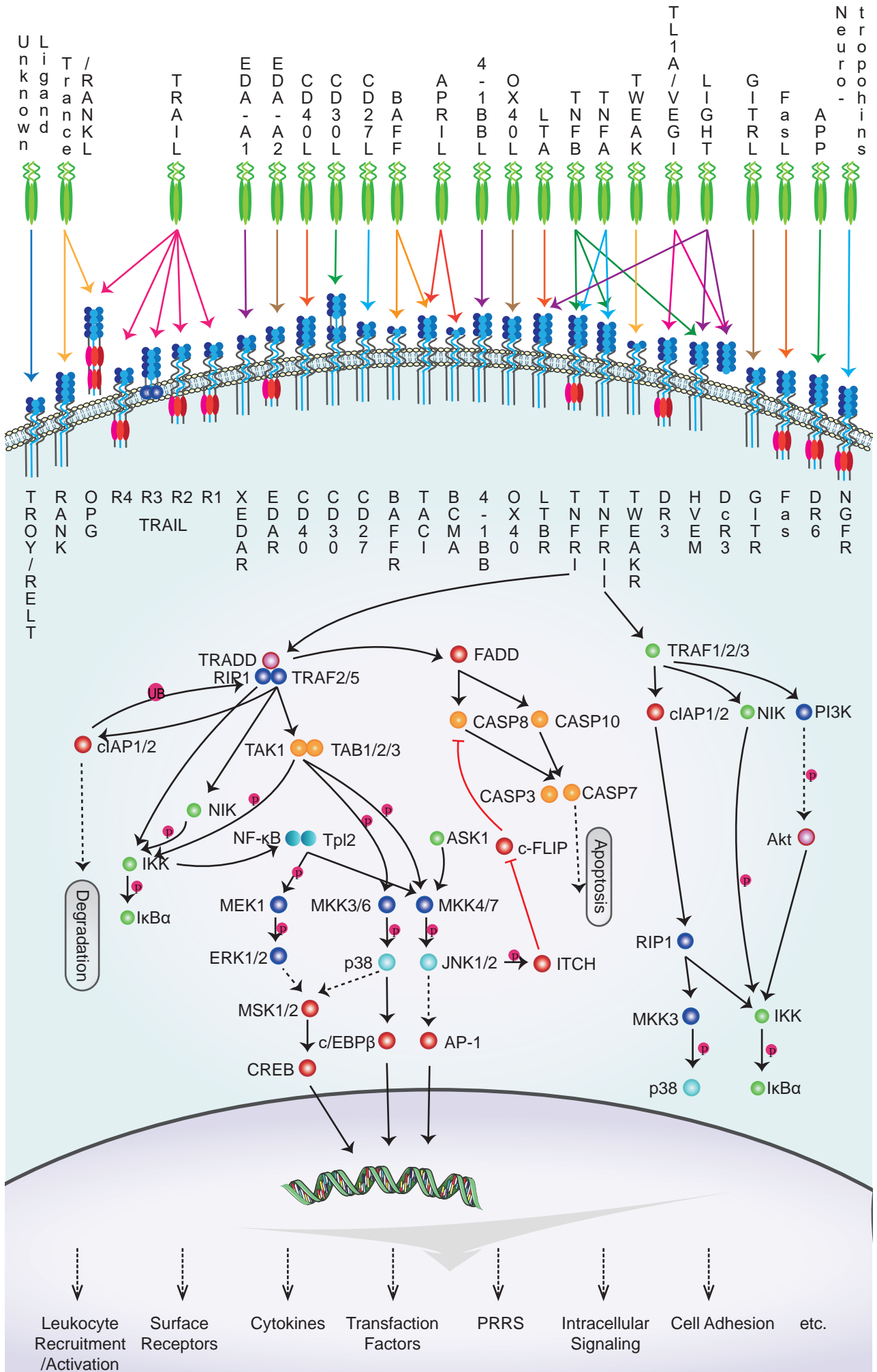
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**TNF Superfamily Signaling Pathway**



## TNF Signal Pathway

TNF superfamily proteins consist of 19 members that signal through 29 receptors. TNF is a multifunctional proinflammatory cytokine, with effects on lipid metabolism, coagulation, insulin resistance, and endothelial function. TNF family members play important roles in various physiological and pathological processes, including cell proliferation, differentiation, apoptosis, modulation of immune responses, and induction of inflammation.

### TNF

TNF- $\alpha$ , a pro-inflammatory cytokine, is produced by many cell types, including macrophages, lymphocytes, fibroblasts, and keratinocytes, in response to inflammation, infection, and other environmental stresses. TNF-Alpha induces a heterogeneous array of biological effects according to cell type.

TNF- $\beta$  is produced by activated lymphocytes and can be cytotoxic to many tumors and other cells. In neutrophils, endothelial cells, and osteoclasts, TNF-Beta can lead to activation while in many other cell types it can lead to increased expression of MHC and adhesion molecules.

TRAFs are a major group of intracellular adaptors that bind directly or indirectly to many members of the TNF receptor superfamily. Six mammalian TRAFs, TRAF1 through TRAF6, have been identified. TRAFs can induce the activation of several kinase cascades that ultimately lead to the activation of signal transduction pathways such as NF- $\kappa$ B, JNK, ERK, p38, and PI3K, which can regulate cellular processes ranging from cell proliferation and differentiation to apoptosis.

### TNF Receptors

The 19 ligands mediate their cellular response through 29 receptors, which belong to the TNF receptor (TNFR) superfamily. These ligands are characterized by the presence of a cysteine-rich domain (CRD) in the extracellular portion. Based on their cytoplasmic sequences and signaling properties, these TNF receptors can be classified into three major groups.

The first group, including Fas/ CD95/ Apo1/ APT1, TNFR1/ CD120a /p55-R /TNFAR/ TNFR60, DR3/TRAMP/WSL1/LARD/WALLR/DDR3/TR3/Apo3, DR4/TRAILR1/Apo2, DR5/TRAILR2/KILLER/TRICK2A/TRICKB, and DR6/TR7, contains a DD (Death Domain) in the cytoplasmic tail. Fas, DR4, and DR5 interact with FADD while TNFR1 and DR3 interact with the adaptor TRADD. These molecules, in turn, cause the activation of the Caspase cascade and induction of apoptosis.

The second group includes TNFR2/p75/CD120b/TNFR80/TNFBR, CD40/p50/Bp50, CD30/Ki-1/D1S166E, CD27/Tp55/S152, TNFR2-RP/TNFRCR/TNFRIII, LT-BetaR, OX40/ CD134/ACT35/TXGP1L, 4-1BB/CD137/ILA, BAFFR, BCMA/BCM, TACI/CAML interactor, RANK/TRANCE-R, p75NGFR, HVEM /HveA/ATAR/TR2/ LIGHTR, GITR/AITR/ TNFRSF18, TROY/TAJ, EDAR, XEDAR/EDA-A2R, RELT, and Fn14. These receptors contain one or more TIM (TRAF Interacting Motifs) in their cytoplasmic tails. Activation of TIM containing TNF receptors lead to recruitment of TRAF family members, and activation of multiple signal transduction pathways such as NF- $\kappa$ B, JNK, p38, ERK, and PI3K.

The third group of TNF receptor family members, including DcR1/TRID/TRAIL-R3, DcR2/ TRUND/ TRAIL-R4, DcR3, and Opg, does not contain functional intracellular signaling domains or motifs. Although this group of

receptors cannot provide intracellular signaling, they can effectively compete with the other two signaling groups of receptors for their corresponding ligands. These DcR, therefore, function by impeding the activation of signal transduction pathways by other TNF receptors.

### **TNF Signaling Pathway**

The TNF superfamily of cytokines activate signaling pathways for cell survival, death, and differentiation. TNF signaling has been implicated in many other diseases, including multiple sclerosis, Alzheimer's disease, and TRAPS (TNF-Receptor-Associated Periodic Syndrome).

Upon contacting with the ligand, TNF receptors also form trimers, fitting their tips into the grooves that formed between TNF monomers. This binding induces a change in the conformation in the receptor, leading to the dissociation of the inhibitory protein SODD from the intracellular death domain. This dissociation enables the adaptor protein TRADD to bind to the death domain, serving as a platform for subsequent protein binding. Following TRADD binding, three pathways can be initiated.

- **Activation of NF- $\kappa$ B:** TRADD recruits TRAF2 and RIP. TRAF2, in turn, recruits the multicomponent protein kinase IKK, enabling the serine-threonine kinase RIP to activate it. An inhibitory protein, I $\kappa$ B $\alpha$ , normally binds to NF- $\kappa$ B and inhibits its translocation, is phosphorylated by IKK and subsequently degraded, releasing NF- $\kappa$ B. NF- $\kappa$ B is a heterodimeric transcription factor that translocates to the nucleus and mediates the transcription of a vast array of proteins involved in cell survival and proliferation, inflammatory response, and anti-apoptotic factors.
- **Activation of the MAPK pathways:** Of the three major MAPK cascades, TNF induces a strong activation of the stress-related JNK group, evokes the moderate response of the p38-MAPK, and is responsible for the minimal activation of the classical ERKs. TRAF2/Rac activates the JNK-inducing upstream kinases of MLK2/MLK3, TAK1, MEKK1, and ASK1. SRC- Vav- Rac axis activates MLK2/MLK3 and these kinases phosphorylate MKK7, which then activates JNK. JNK translocates to the nucleus and activates transcription factors such as c-Jun and ATF2. The JNK pathway is involved in cell differentiation, proliferation, and is generally pro-apoptotic.
- **Induction of death signaling:** Like all death-domain-containing members of the TNFR superfamily, TNFR1 is involved in death signaling. However, TNF-induced cell death only plays a minor role compared to its overwhelming functions in the inflammatory process. Its death-inducing capability is weak compared to other family members, such as Fas, and often masked by the anti-apoptotic effects of NF- $\kappa$ B. Nevertheless, TRADD binds FADD, which then recruits the cysteine protease caspase-8. A high concentration of caspase-8 induces its autoproteolytic activation and the subsequent cleaving of the effector caspases, leading to cell apoptosis.

**Featured Protein Products Related to TNF Signal Pathway**

Group	Cat.No.	Product Name	Tag	Species	Source
TNFSF11	TNFSF11-209H	Recombinant Human TNFSF11 Protein, Fc-Avi-tagged, Biotinylated	Avi   Fc	Human	HEK293
	TNFSF11-394H	Recombinant Human TNFSF11 Protein (Gly 64 - Asp 245), His-tagged	His	Human	HEK293
	TNFSF11-395H	Recombinant Human TNFSF11 Protein, Fc-tagged	Fc	Human	HEK293
	TNFSF11-2022H	Recombinant Human TNFSF11 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
TNFSF10	TNFSF10-302H	Recombinant Human TNFSF10 Protein, His-tagged	His	Human	E.coli
	TNFSF10-31604TH	Recombinant Human TNFSF10, FLAG-tagged	Flag	Human	E.coli
	TNFSF10-557H	Recombinant Human TNFSF10, Fc tagged	Fc	Human	E.coli
EDA	EDA-2082H	Recombinant Human Ectodysplasin A, FLAG-tagged	Flag	Human	HEK293
	EDA-928H	Recombinant Human EDA Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	EDA-2082H	Recombinant Human Ectodysplasin A, FLAG-tagged	Flag	Human	HEK293
	EDA-928H	Recombinant Human EDA Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
CD40LG	CD40LG-280H	Recombinant Human CD40LG Protein, Fc-Avi-tagged, Biotinylated	Avi   Fc	Human	HEK293
	CD40LG-0818H	Recombinant Human CD40LG Protein, GST-Tagged	GST	Human	Wheat Germ
	CD40LG-117H	Recombinant Human CD40LG Protein, His-tagged	His	Human	HEK293
	CD40LG-193H	Recombinant Human CD40LG, FLAG-tagged	Flag	Human	CHO
TNFSF8	TNFSF8-2076H	Recombinant Human TNFSF8, FLAG-tagged	Flag	Human	HEK293
	TNFSF8-2258H	Recombinant Human TNFSF8 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	TNFSF8-890H	Recombinant Human TNFSF8 Protein, His-tagged	His	Human	CHO
TNFSF13	TNFSF13-399H	Recombinant Human TNFSF13, FLAG-tagged	Flag	Human	HEK293

Group	Cat.No.	Product Name	Tag	Species	Source
	TNFSF13-5106H	Recombinant Human TNFSF13, T7-tagged	T7	Human	E.coli
TNFSF9	TNFSF9-231H	Recombinant Human TNFSF9 Protein (Leu 24 - Gln 186), His-tagged	His	Human	HEK293
	TNFSF9-720H	Recombinant Human TNFSF9 Protein, Fc-Avi-tagged, Biotinylated	Avi   Fc	Human	HEK293
	TNFSF9-1389H	Recombinant Human TNFSF9 Protein, His-tagged	His	Human	HEK293
	TNFSF9-2075H	Recombinant Human TNFSF9, FLAG-tagged	Flag	Human	HEK293
	TNFSF9-719H	Recombinant Human TNFSF9 Protein, Fc-tagged	Fc	Human	HEK293
TNFSF4	TNFSF4-344H	Recombinant Human TNFSF4 Protein, MlgG2a Fc-tagged, low endotoxin	MlgG2a Fc	Human	HEK293
	TNFSF4-886M	Recombinant Mouse TNFSF4 Protein (Gln49-Leu198), MlgG1 Fc-tagged	MlgG1 Fc	Human	HEK293
	TNFSF4-2259H	Recombinant Human TNFSF4 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	TNFSF4-27254TH	Recombinant Human TNFSF4	N/A	Human	Hi-5 Insect Cell
	TNFSF4-272H	Recombinant Human TNFSF4, His-tagged	His	Human	HEK293
	TNFSF4-490H	Recombinant Human TNFSF4 Protein, Fc-tagged	Fc	Human	HEK293
LTA	LTA-1223H	Recombinant Human LTA Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	LTA-4597H	Recombinant Human LTA Protein, GST-tagged	GST	Human	Wheat Germ
	LTA-568H	Recombinant Human LTA protein, His & T7-tagged	His   T7	Human	E.coli
TNFB	TNFB-3319H	Recombinant Human TNFB, His-tagged	His	Human	E.coli
TNFA	TNFA-386H	Recombinant Human TNFA Protein, GST-tagged	GST	Human	E.coli
	TNF-39H	Recombinant Human TNFa	N/A	Human	HEK293
	TNFA-3314H	Recombinant Human TNFA, His-tagged	His	Human	E.coli

Group	Cat.No.	Product Name	Tag	Species	Source
TNFSF12	TNFSF12-1068H	Recombinant Human TNFSF12 protein, His-tagged	His	Human	E.coli
	TNFSF12-2097H	Recombinant Human TNFSF12, FLAG-tagged	Flag	Human	E.coli
TNFSF15	TNFSF15-556H	Recombinant Human TNFSF15 Protein, Fc-tagged	Fc	Human	HEK293
	TNFSF15-31532TH	Recombinant Human TNFSF15, His-tagged	His	Human	E.coli
TNFSF14	TNFSF14-552H	Recombinant Human TNFSF14 Protein, Fc-tagged	Fc	Human	HEK293
	TNFSF14-217H	Recombinant Human TNFSF14 Protein, His-tagged	His	Human	HEK293
	TNFSF14-29946TH	Recombinant Human TNFSF14, FLAG-tagged	Flag	Human	CHO
TNFSF18	TNFSF18-38H	Recombinant Human TNFSF18 Protein, Fc-Avi-tagged, Biotinylated	Avi   Fc	Human	HEK293
	TNFSF18-640H	Recombinant Human TNFSF18 Protein (Glu52-Ser177), His-tagged	His	Human	Insect Cell
	TNFSF18-277H	Recombinant Human TNFSF18, FLAG-tagged	Flag	Human	HEK293
	TNFSF18-37H	Recombinant Human TNFSF18 protein, Fc-tagged	Fc	Human	HEK293
	TNFSF18-507H	Recombinant Human TNFSF18 protein, His-tagged	His	Human	HEK293F
FASLG	FASLG-1394H	Recombinant Human FASLG Protein (103-281 aa), His-tagged	His	Human	Yeast
	FASLG-245H	Recombinant Human FASLG, Fc-tagged	Fc	Human	HEK293
	FASLG-2703H	Recombinant Human FASLG, His-tagged	His	Human	CHO
APP	APP-192H	Recombinant Human APP Protein, His/GST-tagged	His   GST	Human	E.coli
	APP-243H	Recombinant Human APP protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	APP-721H	Recombinant Human APP protein, GST-tagged	GST	Human	Wheat Germ
TNFRSF19	TNFRSF19-1064H	Recombinant Human TNFRSF19 protein, His & T7-tagged	His   T7	Human	E.coli
	TNFRSF19-282H	Recombinant Human TNFRSF19, Fc Chimera	Fc Chimera	Human	NS0
RELT	RELT-1219H	Recombinant Human RELT Protein (26-153 aa), His-tagged	His	Human	E.coli

Group	Cat.No.	Product Name	Tag	Species	Source
	RELT-657H	Recombinant Human RELT Protein, hlgG-His-tagged	His   HlgG	Human	Insect Cell
	RELT-872H	Recombinant Human RELT Protein, Fc-tagged	Fc	Human	HEK293
TNFRSF11A	TNFRSF11A-392H	Recombinant Human TNFRSF11A Protein, MlgG2a Fc-tagged, low endotoxin	MlgG2a Fc	Human	HEK293
	TNFRSF11A-1678H	Recombinant Human TNFRSF11A, Fc-His	Fc   His	Human	NSO
	TNFRSF11A-184H	Recombinant Human TNFRSF11A Protein, His-tagged	His	Human	E.coli
	TNFRSF11A-30901TH	Recombinant Human TNFRSF11A, Fc-tagged	Fc	Human	HEK293
TNFRSF11B	TNFRSF11B-365H	Recombinant Human TNFRSF11B Protein (Met1-Leu401), HlgG1 Fc-tagged	HlgG1 Fc	Human	Insect Cell
	TNFRSF11B-142H	Recombinant Human TNFRSF11B protein, Fc-tagged	Fc	Human	Yeast
	TNFRSF11B-143H	Recombinant Human TNFRSF11B, His-tagged	His	Human	E.coli
	TNFRSF11B-655H	Recombinant Human TNFRSF11B Protein, Fc-tagged	Fc	Human	HEK293
TNFRSF10A	TNFRSF10A-524H	Recombinant Human TNFRSF10A, Fc-tagged	Fc	Human	HEK293
	TNFRSF10A-597H	Recombinant Human TNFRSF10A, Fc-tagged, Biotinylated	Fc	Human	Human Cell
	TNFRSF10A-883H	Recombinant Human TNFRSF10A, Fc-His tagged	Fc   His	Human	Human Cell
TNFRSF10B	TNFRSF10B-377H	Recombinant Human TNFRSF10B Protein (Ile 56 - Glu 182), Fc-tagged	Fc	Human	HEK293
	TNFRSF10B-599H	Recombinant Human TNFRSF10B Protein, His-Avi-tagged, Biotinylated	His   Avi	Human	HEK293
	TNFRSF10B-1999H	Recombinant Human TNFRSF10B Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	TNFRSF10B-309H	Recombinant Human TNFRSF10B Protein, His-tagged	His	Human	HEK293
	TNFRSF10B-310H	Recombinant Human TNFRSF10B Protein, Fc/His-tagged	Fc   His	Human	HEK293
	TNFRSF10B-56H	Recombinant Human TNFRSF10B protein, Fc-tagged, FITC-labeled	Fc	Human	HEK293
TNFRSF10C	TNFRSF10C-546H	Recombinant Human TNFRSF10C Protein, His-tagged	His	Human	HEK293



Group	Cat.No.	Product Name	Tag	Species	Source
	TNFRSF10C-2096H	Recombinant Human TNFRSF10C, Fc-tagged	Fc	Human	HEK293
	TNFRSF10C-308H	Recombinant Human TNFRSF10C Protein, Fc/His-tagged	Fc   His	Human	HEK293
	TNFRSF10C-576H	Recombinant Human TNFRSF10C protein, His & GST-tagged	His   GST	Human	E.coli
TNFRSF10D	TNFRSF10D-3169H	Recombinant Human TNFRSF10D, His tagged	His	Human	Human Cell
	TNFRSF10D-562H	Recombinant Human TNFRSF10D, Fc-tagged, Biotinylated	Fc	Human	Human Cell
EDA2R	EDA2R-2098H	Recombinant Human Ectodysplasin A2 Receptor, Fc-tagged	Fc	Human	HEK293
	EDA2R-3045H	Recombinant Human EDA2R Protein, GST-tagged	GST	Human	Wheat Germ
	EDA2R-314H	Recombinant Human ectodysplasin A2 receptor, His-tagged	His	Human	E.coli
	EDA2R-433H	Recombinant Human EDA2R Protein, Fc-tagged	Fc	Human	HEK293
EDAR	EDAR-231H	Recombinant Human EDAR, Fc-tagged	Fc	Human	CHO
	EDAR-3049H	Recombinant Human EDAR Protein, GST-tagged	GST	Human	Wheat Germ
	EDAR-606H	Recombinant Human ectodysplasin A receptor, His-tagged	His	Human	E.coli
	EDAR-921H	Recombinant Human EDAR Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
Cd40	CD40-1087H	Recombinant Human CD40 Protein (Met1-Arg193), His-tagged, Biotinylated	His	Human	HEK293
	CD40-108HA	Recombinant Human CD40 protein, Fc-tagged, APC labeled	Fc	Human	CHO
	CD40-108HP	Recombinant Human CD40 protein, Fc-tagged, R-PE labeled	Fc	Human	CHO
	CD40-371H	Recombinant Human CD40 Protein, Fc & Avi-tagged, Biotinylated	Avi   Fc	Human	HEK293
	CD40-0812H	Recombinant Human CD40 Protein, GST-Tagged	GST	Human	Wheat Germ
TNFRSF8	TNFRSF8-1594HA	Recombinant Human TNFRSF8 protein, Fc-tagged, APC labeled	Fc	Human	NS0

Group	Cat.No.	Product Name	Tag	Species	Source
	TNFRSF8-1594HP	Recombinant Human TNFRSF8 protein, Fc-tagged, R-PE labeled	Fc	Human	NSO
	TNFRSF8-434H	Recombinant Human TNFRSF8 Protein (Met1-Lys379), His-tagged, Biotinylated	His	Human	HEK293
	TNFRSF8-2027H	Recombinant Human TNFRSF8 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	TNFRSF8-2031H	Recombinant Human TNFRSF8 Protein, DDK-tagged	DDK	Human	Insect Cell
CD27	CD27-336H	Recombinant Human CD27 Protein, His-tagged	His	Human	HEK293
	CD27-141H	Recombinant Human CD27, Fc-tagged	Fc	Human	CHO
	CD27-180H	Recombinant Human CD27 Protein, Fc-tagged	Fc	Human	HEK293
	CD27-887H	Recombinant Human CD27 Protein, DDK/His-tagged	DDK   His	Human	HEK293
TNFRSF13C	TNFRSF13C-120H	Recombinant Human TNFRSF13C, Fc-tagged	Fc	Human	HEK293
	TNFRSF13C-362H	Recombinant Human TNFRSF13C Protein, His-tagged	His	Human	E.coli
	TNFRSF13C-363H	Recombinant Human TNFRSF13C Protein, His/GST-tagged	His   GST	Human	E.coli
TNFRSF13B	TNFRSF13B-359H	Recombinant Human TNFRSF13B Protein (Ser 2 - Thr 166), Fc-tagged	Fc	Human	HEK293
	TNFRSF13B-694H	Recombinant Human TNFRSF13B Protein, Fc-Avi-tagged, Biotinylated	Avi   Fc	Human	HEK293
	TNFRSF13B-3320H	Recombinant Human TNFRSF13B, GST-tagged	GST	Human	E.coli
	TNFRSF13B-7545H	Recombinant Human TNFRSF13B, His-tagged	His	Human	E.coli
TNFRSF17	TNFRSF17-1817HA	Recombinant Human TNFRSF17 protein, Fc-tagged, APC labeled	Fc	Human	HEK293
	TNFRSF17-1817HP	Recombinant Human TNFRSF17 protein, Fc-tagged, R-PE labeled	Fc	Human	HEK293
	TNFRSF17-240H	Recombinant Human TNFRSF17 Protein, His-Avi-tagged, Biotinylated	His   Avi	Human	HEK293
	TNFRSF17-323H	Recombinant Human TNFRSF17 Protein (Met 1 - Ala 54), His-tagged, FITC-Labeled	His	Human	HEK293

Group	Cat.No.	Product Name	Tag	Species	Source
	TNFRSF17-239H	Recombinant Human TNFRSF17 Protein, Fc-tagged, FITC-Labeled	Fc	Human	HEK293
TNFRSF9	TNFRSF9-328H	Recombinant Human TNFRSF9 Protein (Met1-Gln186), His-Fc-tagged, Biotinylated	His   Fc	Human	HEK293
	TNFRSF9-329H	Recombinant Human TNFRSF9 Protein (Met1-Gln186), His-tagged, Biotinylated	His	Human	HEK293
	TNFRSF9-344H	Recombinant Human TNFRSF9 Protein (Gln 25 - Gln 186), Fc-tagged	Fc	Human	HEK293
	TNFRSF9-134H	Recombinant Human TNFRSF9 Protein, Fc-tagged	Fc	Human	CHO
	TNFRSF9-525H	Recombinant Human TNFRSF9, Fc-tagged, Biotinylated	Fc	Human	Human Cell
	TNFRSF9-526H	Recombinant Human TNFRSF9 Protein, Fc & Avi-tagged, Biotinylated	Avi   Fc	Human	HEK293
	TNFRSF9-954H	Recombinant Human TNFRSF9 Protein, DDK/His-tagged	DDK   His	Human	HEK293
	TNFRSF4	TNFRSF4-339H	Recombinant Human TNFRSF4 Protein (Leu 29 - Ala 216), Fc-tagged	Fc	Human
TNFRSF4-393H		Recombinant Human TNFRSF4 Protein (Met1-Ala216), His-tagged, Biotinylated	His	Human	HEK293
TNFRSF4-442H		Recombinant Human TNFRSF4 Protein, Fc-Avi-tagged, Biotinylated	Avi   Fc	Human	HEK293
TNFRSF4-1826H		Recombinant Human TNFRSF4 protein, His & Avi-tagged, Biotinylated	His   Avi	Human	HEK293
TNFRSF4-2034H		Recombinant Human TNFRSF4 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
TNFRSF4-871H		Recombinant Human TNFRSF4 Protein, DDK/His-tagged	DDK   His	Human	HEK293
LTBR		LTBR-190H	Recombinant Human LTBR protein, Fc-tagged	Fc	Human
	LTBR-1665H	Recombinant Human LTBR, His-tagged	His	Human	NSO
	LTBR-4589H	Recombinant Human LTBR Protein, GST-tagged	GST	Human	Wheat Germ

Group	Cat.No.	Product Name	Tag	Species	Source
	LTBR-960H	Recombinant Human LTBR Protein, His-tagged	His	Human	HEK293
TNFRSF1A	TNFRSF1A-1690H	Recombinant Human TNFRSF1A, Fc&His-tagged	Fc   His	Human	NSO
	TNFRSF1A-1908H	Recombinant Human TNFRSF1A, Fc-His	Fc	Human	NSO
	TNFRSF1A-30481TH	Recombinant Human TNFRSF1A, Fc-tagged	Fc	Human	HEK293
	TNFRSF1A-3190H	Recombinant Human TNFRSF1A Protein, His & Avi-tagged, Biotinylated	His   Avi	Human	HEK293
TNFRSF1B	TNFRSF1B-1689H	Recombinant Human TNFRSF1B, Fc&His-tagged	Fc   His	Human	NSO
	TNFRSF1B-62H	Recombinant Human TNFRSF1B protein, His-tagged	His	Human	Insect Cell
	TNFRSF1B-66H	Recombinant Human TNF-R2, Fc-tagged	Fc	Human	HEK293
TNFRSF12A	TNFRSF12A-221H	Recombinant Human TNFRSF12A Protein, Fc-tagged	Fc	Human	HEK293
	TNFRSF12A-7734H	Recombinant Human TNFRSF12A protein, His & GST-tagged	His   GST	Human	E.coli
TNFRSF25	TNFRSF25-2154H	Recombinant Human TNFRSF25 Protein (25-199 aa), His-tagged	His	Human	E.coli
	TNFRSF25-2081H	Recombinant Human TNFRSF25, Fc Chimera	Fc	Human	HEK293
	TNFRSF25-596H	Recombinant Human TNFRSF25, Fc-tagged, Biotinylated	Fc	Human	Human Cell
TNFRSF14	TNFRSF14-1151H	Recombinant Human TNFRSF14 Protein (Met1-Val202), AVI-Fc-tagged, Biotinylated	Avi   Fc	Human	HEK293
	TNFRSF14-371H	Recombinant Human TNFRSF14 Protein (Met1-Val202), His-Fc-tagged, Biotinylated	His   Fc	Human	HEK293
	TNFRSF14-373H	Recombinant Human TNFRSF14 Protein, Fc-tagged	Fc	Human	HEK293
	TNFRSF14-374H	Recombinant Human TNFRSF14 Protein, Strep-tagged	Strep	Human	HEK293
	TNFRSF14-877H	Recombinant Human TNFRSF14 Protein, DDK/His-tagged	DDK   His	Human	HEK293
TNFRSF6B	TNFRSF6B-333H	Recombinant Human tumor necrosis factor receptor superfamily, member 6b, decoy, His-tagged	His	Human	E.coli

Group	Cat.No.	Product Name	Tag	Species	Source
	TNFRSF6B-432H	Recombinant Human TNFRSF6B, Fc tagged	Fc	Human	Insect Cell
	TNFRSF6B-433H	Recombinant Human TNFRSF6B protein, Fc-tagged	Fc	Human	HEK293
TNFRSF18	TNFRSF18-2091H	Recombinant Human TNFRSF18 Protein, His-Avi-tagged, Biotinylated	His   Avi	Human	HEK293
	TNFRSF18-329H	Recombinant Human TNFRSF18 Protein, His-tagged	His	Human	HEK293
	TNFRSF18-619H	Recombinant Human TNFRSF18 Protein, Fc-Avi-tagged, Biotinylated	Avi   Fc	Human	HEK293
	TNFRSF18-1995H	Recombinant Human TNFRSF18 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	TNFRSF18-2086H	Recombinant Human TNFRSF18, Fc-tagged	Fc	Human	HEK293
FAS	Fas-026H	Recombinant Human Fas Protein, Fc-tagged	Fc	Human	HEK293
	Fas-027H	Recombinant Human Fas Protein, His-tagged	His	Human	HEK293
	FAS-16H	Recombinant Human FAS protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	FAS-3853H	Recombinant Human FAS Protein, GST-tagged	GST	Human	Wheat Germ
	FAS-38H	Recombinant Human Fas Ligand soluble, FLAG-tagged	Flag	Human	HEK293
TNFRSF21	TNFRSF21-228H	Recombinant Human TNFRSF21, Fc-tagged	Fc	Human	HEK293
	TNFRSF21-943H	Recombinant Human TNFRSF21 Protein, His-tagged	His	Human	HEK293
NGFR	NGFR-452H	Recombinant Human NGFR, 209aa, Fc Chimera	Fc	Human	HEK293
	NGFR-653H	Recombinant Human NGFR, Fc-tagged, Biotinylated	Fc	Human	Human Cell
	NGFR-80H	Recombinant Human NGFR protein, His-tagged	His	Human	Insect Cell
TRADD	TRADD-29977TH	Recombinant Human TRADD, His-tagged	His	Human	E.coli
	TRADD-3383H	Recombinant Human TRADD, His-tagged	His	Human	E.coli
RALBP1	RALBP1-2167H	Recombinant Human RALBP1, GST-tagged	GST	Human	E.coli

Group	Cat.No.	Product Name	Tag	Species	Source
	RALBP1-706H	Recombinant Human RALBP1 Protein, His-tagged	His	Human	E.coli
TRAF2	TRAF2-1500H	Recombinant Human TRAF2 Protein, GST-tagged	GST	Human	Insect cell
	TRAF2-31601TH	Recombinant Human TRAF2, His-tagged	His	Human	
TRAF5	TRAF5-842H	Recombinant Human TRAF5 Protein (1-557 aa), His-SUMO-tagged	His   SUMO	Human	E.coli
	TRAF5-3388H	Recombinant Human TRAF5, GST-tagged	GST	Human	E.coli
	TRAF5-559H	Recombinant Human TRAF5 Protein, His-tagged	His	Human	E.coli
TRAF1	TRAF1-31600TH	Recombinant Human TRAF1, His-tagged	His	Human	E.coli
	TRAF1-389H	Recombinant Human TRAF1 Protein, His/GST-tagged	His   GST	Human	E.coli
TRAF2	TRAF2-1500H	Recombinant Human TRAF2 Protein, GST-tagged	GST	Human	Insect cell
	TRAF2-31601TH	Recombinant Human TRAF2, His-tagged	His	Human	
TRAF3	TRAF3-3386H	Recombinant Human TRAF3, GST-tagged	GST	Human	Wheat Germ
	TRAF3-3387H	Recombinant Human TRAF3, MYC/DDK-tagged	Myc   DDK	Human	HEK293
FADD	FADD-28817TH	Recombinant Human FADD, His-tagged	His	Human	E.coli
	FADD-3640H	Recombinant Human FADD Protein, GST-tagged	GST	Human	Wheat Germ
BIRC2	BIRC2-1168H	Recombinant Human BIRC2 protein, His & S-tagged	His   S	Human	E.coli
	BIRC2-1169H	Recombinant Human BIRC2 protein, His & GST-tagged	His   GST	Human	E.coli
	BIRC2-2587H	Recombinant Human BIRC2 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	BIRC2-67H	Recombinant Human BIRC2 protein, GST/StrepII-tagged	GST   StrepII	Human	E.coli
BIRC3	BIRC3-190H	Recombinant Human BIRC3, GST-tagged	GST	Human	Sf9 Insect Cell
	BIRC3-554H	Recombinant Human BIRC3	His	Human	Mammalian Cell
	BIRC3-635H	Recombinant Human BIRC3 Protein, GST-tagged, Active	GST	Human	Insect Cell

Group	Cat.No.	Product Name	Tag	Species	Source
	BIRC3-70H	Recombinant Human BIRC3 protein, His/StrepII-tagged	His   StrepII	Human	E.coli
NR2C2	NR2C2-1089H	Recombinant Human NR2C2 protein, His & T7-tagged	His   T7	Human	E.coli
	NR2C2-6079H	Recombinant Human NR2C2 Protein, GST-tagged	GST	Human	Wheat Germ
TAB1	TAB1-22H	Recombinant Human TAB1 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293T
	TAB1-157H	Recombinant Human TAB1 protein, T7/His-tagged	T7   His	Human	E.coli
	TAB1-30837TH	Recombinant Human TAB1, His-tagged	His	Human	E.coli
TAB2	TAB2-2769H	Recombinant Human TAB2 Protein (401-693 aa), His-Myc-tagged	His   Myc	Human	Insect Cell
	TAB2-374H	Recombinant Human TAB2 Protein, His-tagged	His	Human	E.coli
	TAB2-375H	Recombinant Human TAB2 Protein, GST-tagged	GST	Human	E.coli
CASP8	CASP8-147H	Recombinant Human CASP8 Protein, His-tagged	His	Human	E.coli
	CASP8-7828H	Recombinant Human CASP8 protein, His & T7-tagged	His   T7	Human	E.coli
CASP10	CASP10-0414H	Recombinant Human CASP10 Protein, GST-Tagged	GST	Human	Wheat Germ
	CASP10-557H	Recombinant Human CASP10	His	Human	Mammalian Cell
CASP3	CASP3-0421H	Recombinant Human CASP3 Protein, GST-Tagged	GST	Human	Wheat Germ
	CASP3-192H	Recombinant Human CASP3, Met&His-tagged	Met   His	Human	E.coli
	CASP3-621H	Recombinant Human CASP3 protein, His-tagged	His	Human	E.coli
CASP7	CASP7-0430H	Recombinant Human CASP7 Protein, GST-Tagged	GST	Human	Wheat Germ
	CASP7-680H	Recombinant Human CASP7 Protein, His-tagged	His	Human	E.coli
MAP3K14	MAP3K14-1065	Recombinant Human MAP3K14 protein, GST-tagged	GST	Human	Insect Cell
PIK3CA	PIK3CA&PIK3R1-150H	Recombinant Human PIK3CA(E545K)/PIK3R1 protein, His-tagged, Active	His	Human	Insect Cell

Group	Cat.No.	Product Name	Tag	Species	Source
	PIK3CA&PIK3R1-151H	Recombinant Human PIK3CA(N345K)/PIK3R1 protein, His-tagged, Active	His	Human	Insect Cell
	PIK3CA&PIK3R1-152H	Recombinant Human PIK3CA(E542K)/PIK3R1 protein, His-tagged, Active	His	Human	Insect Cell
	PIK3CA&PIK3R1-153H	Recombinant Human PIK3CA/PIK3R1 protein, GST-tagged, Active	GST	Human	Insect Cell
	PIK3CA-70H	Recombinant Human PIK3CA protein, Flag-tagged, Biotinylated	Flag	Human	Insect Cell
PIK3CB	PIK3CB/PIK3R1-632H	Recombinant Human PIK3CB/PIK3R1, FLAG-tagged	Flag	Human	Sf9 Insect Cell
	PIK3CB-1724H	Recombinant Human PIK3CB protein, His-tagged	His	Human	E.coli
PIK3CD	PIK3CD-1727H	Recombinant Human PIK3CD protein, His & T7-tagged	His   T7	Human	E.coli
	PIK3CD-1896H	Recombinant Human Phosphoinositide-3-Kinase, Catalytic, Delta Polypeptide, His-tagged	His	Human	Sf9 Insect Cell
	PIK3CD-29587TH	Recombinant Human PIK3CD	N/A	Human	
	PIK3CD-52H	Recombinant Human PIK3CD, GST-tagged	GST	Human	Sf9 Insect Cell
PIK3CG	PIK3CG-158H	Recombinant Human PIK3CG protein, His-tagged, Active	His	Human	Insect Cell
	PIK3CG-53H	Recombinant Human PIK3CG, His-tagged	His	Human	Sf9 Insect Cell
	PIK3CG-55H	Recombinant Human PIK3CG, GST-tagged	GST	Human	Sf9 Insect Cell
NFKB1	NFKB1-300H	Recombinant Human NFKB1 protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	NFKB1-301H	Recombinant Human NFKB1 protein, His/T7-tagged	His   T7	Human	E.coli
NFKB2	NFKB2-1280H	Recombinant Human NFKB2, GST-tagged	GST	Human	E.coli
	NFKB2-306H	Recombinant Human NFKB2 protein, His/MBP-tagged	His   MBP	Human	E.coli
	NFKB2-4859	Recombinant Human NFKB2 protein, GST-tagged	GST	Human	Insect Cell
	NFKB2-4859H	Recombinant Human NFKB2, GST-tagged	GST	Human	Sf9 Insect Cell



Group	Cat.No.	Product Name	Tag	Species	Source
	NFKB2-7052H	Recombinant Human NFKB2, GST-tagged	GST	Human	Sf9 Insect Cell
	NFKB2-815H	Recombinant Human NFKB2 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
MAP3K8	MAP3K8-636H	Recombinant Human MAP3K8, GST-His	GST	Human	Sf9 Insect Cell
MAP3K5	MAP3K5-11H	Recombinant Human MAP3K5 protein, His-tagged	His	Human	E.coli
	MAP3K5-1260H	Recombinant Human Mitogen-Activated Protein Kinase Kinase Kinase 5, GST-tagged	GST	Human	Insect Cell
	MAP3K5-20H	Recombinant Human MAP3K5 protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	MAP3K5-63H	Recombinant Human MAP3K5 protein, Flag-tagged, Biotinylated	Flag	Human	Insect Cell
AKT1	AKT1-14H	Recombinant Human AKT1 Protein, His-tagged	His	Human	Insect Cell
	AKT1-336H	Recombinant Human AKT1 Protein, His & Strep-tagged	His   Strep	Human	HEK293
	AKT1-101H	Recombinant Human AKT1, GST-tagged	GST	Human	Sf9 Insect Cell
	AKT1-155H	Recombinant Human AKT1 protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	AKT1-30H	Recombinant Human AKT1 protein, Flag-tagged, Biotinylated	Flag	Human	Insect Cell
AKT2	AKT2-103H	Recombinant Human AKT2, GST-tagged, Active	GST	Human	Sf9 Insect Cell
	AKT2-1364H	Recombinant Human AKT2 (Active), His-tagged	His	Human	Sf9 Insect Cell
	AKT2-31H	Recombinant Human AKT2 protein, Flag-tagged, Biotinylated	Flag	Human	Insect Cell
AKT3	AKT3-131H	Recombinant Human AKT3, GST tagged	GST	Human	Insect Cell
	Akt3-159H	Recombinant Human Akt3, His-tagged	His	Human	E.coli
	AKT3-26H	Recombinant Human AKT3 (E17K), GST-tagged	GST	Human	Sf9 Insect Cell
	AKT3-308H	Recombinant Human AKT3 protein, His/MBP-tagged	His   MBP	Human	E.coli
	AKT3-804H	Recombinant Human AKT3 protein, GST-His-tagged	GST   His	Human	Insect Cell
NFKBIA	NFKBIA-1463H	Recombinant Human NFKBIA, GST-tagged	GST	Human	E.coli

Group	Cat.No.	Product Name	Tag	Species	Source
	NFKBIA-163H	Recombinant Human NFKBIA protein, His/MBP-tagged	His   MBP	Human	E.coli
	NFKBIA-3340H	Recombinant Human NFKBIA, His tagged	His	Human	E.coli
	NFKBIA-819H	Recombinant Human NFKBIA Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
MAP2K1	MAP2K1-167H	Recombinant Human v protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	MAP2K1-175H	Recombinant Human MAP2K1, GST-tagged	GST	Human	E.coli
	MAP2K1-2568H	Recombinant Human MAP2K1, His-tagged	His	Human	Insect Cell
	MAP2K1-62H	Recombinant Human MAP2K1 protein, Flag-tagged, Biotinylated	Flag	Human	Insect Cell
MAP2K3	MAP2K3-29204TH	Recombinant Human MAP2K3, His-tagged	His	Human	E.coli
	MAP2K3-303H	Recombinant Human MAP2K3 protein, His/MBP-tagged	His   MBP	Human	E.coli
MAP2K6	MAP2K6-392H	Recombinant Human MAP2K6 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	MAP2K6-47H	Recombinant Human MEK6, GST-tagged	GST	Human	Sf9 Insect Cell
	MAP2K6-525H	Recombinant Human MKK6, Gly & Pro tagged	His	Human	Insect Cell
	MAP2K6-888H	Recombinant Human MAP2K6, His & GST tagged	His   GST	Human	Insect Cell
MAP2K4	MAP2K4-17H	Recombinant Human MAP2K4 Protein, GST-tagged	GST	Human	E.coli
	MAP2K4-105H	Recombinant Human MAP2K4, His-tagged	His	Human	Sf9 Insect Cell
	MAP2K4-304H	Recombinant Human MAP2K4 protein, His/MBP-tagged	His   MBP	Human	E.coli
	MAP2K4-394H	Recombinant Human MAP2K4 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	MAP2K4-8086H	Recombinant Human MAP2K4 protein, His & GST-tagged	His   GST	Human	E.coli
MAP2K7	MAP2K7-8085H	Recombinant Human MAP2K7 Protein, GST-tagged	GST	Human	Insect cell
	MAP2K7-8083H	Recombinant Human MAP2K7 protein, His & T7-tagged	His   T7	Human	E.coli
MAPK3	MAPK3-1049H	Recombinant Human Mitogen-Activated Protein Kinase 3 (Inactive), GST-Tagged	GST	Human	E.coli

Group	Cat.No.	Product Name	Tag	Species	Source
	MAPK3-2787H	Recombinant Human MAPK3, His-tagged	His	Human	E.coli
	MAPK3-286H	Recombinant Human MAPK3 protein, His/MBP-tagged	His   MBP	Human	E.coli
	MAPK3-28H	Recombinant human biotinylated ERK1, His-tagged	His	Human	E.coli
MAPK1	MAPK1-2008H	Recombinant Human MAPK1 Protein, GST-tagged	GST	Human	E.coli
	MAPK1-27H	Biotinylated Recombinant Human ERK2, His-tagged	His	Human	E.coli
	MAPK1-308H	Recombinant Human MAPK1, GST-tagged, Active	GST	Human	E.coli
	MAPK1-385H	Recombinant Human MAPK1 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	MAPK1-7267H	Recombinant Human MAPK1, GST tagged	GST	Human	Insect Cell
MAPK8	MAPK8-100H	Recombinant Human MAPK8, His-tagged	His	Human	E.coli
	MAPK8-156H	Recombinant Human MAPK8 protein, His/MBP-tagged	His   MBP	Human	E.coli
	MAPK8-781H	Recombinant Human MAPK8, GST tagged	GST	Human	Insect Cell
MAPK9	MAPK9-1052H	Recombinant Human Mitogen-Activated Protein Kinase 9, GST-Tagged	GST	Human	Sf9 Insect Cell
	MAPK9-155H	Recombinant Human MAPK9 protein, His/MBP-tagged	His   MBP	Human	E.coli
	MAPK9-617H	Recombinant Human MAPK9, His tagged	His	Human	Insect Cell
ITCH	ITCH-3094H	Recombinant Human ITCH, None tagged	N/A	Human	E.coli
	ITCH-5004H	Recombinant Human ITCH Protein, GST-tagged	GST	Human	Wheat Germ
MAP2K3	MAP2K3-29204TH	Recombinant Human MAP2K3, His-tagged	His	Human	E.coli
	MAP2K3-303H	Recombinant Human MAP2K3 protein, His/MBP-tagged	His   MBP	Human	E.coli
RPS6KA5	RPS6KA5-2435H	Recombinant Human RPS6KA5, His-tagged	His	Human	E.coli
	RPS6KA5-359H	Recombinant Human RPS6KA5, GST-tagged, Active	GST	Human	Sf9 Insect Cell
RPS6KA4	RPS6KA4-2434H	Recombinant Human RPS6KA4, His-tagged	His	Human	E.coli

Group	Cat.No.	Product Name	Tag	Species	Source
CREB1	CREB1-182H	Recombinant Human CREB1 Protein, His-tagged	His	Human	E.coli
	CREB1-1839H	Recombinant Human CREB1 Protein, GST-tagged	GST	Human	Wheat Germ
	CREB1-6915H	Recombinant Human CREB1, His & MBP tagged	His   MBP	Human	E.coli
CREB3	CREB3-1842H	Recombinant Human CREB3 Protein, GST-tagged	GST	Human	Wheat Germ
CREB5	CREB5-1112H	Recombinant Human CREB5 protein, His & T7-tagged	His   T7	Human	E.coli
	CREB5-1850H	Recombinant Human CREB5 Protein, GST-tagged	GST	Human	Wheat Germ
CEBPB	CEBPB-3782H	Recombinant Human CEBPB Protein, His-tagged	His	Human	E.coli
	CEBPB-4893H	Recombinant Human CEBPB Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293T
	CEBPB-1101H	Recombinant Human CEBPB Protein, GST-Tagged	GST	Human	Wheat Germ
JUN	JUN-105H	Recombinant Human JUN, His-tagged	His	Human	Insect Cell
	JUN-18H	Recombinant Human JUN protein, GST-tagged	GST	Human	Wheat Germ
	JUN-292H	Recombinant Human JUN protein, His/MBP-tagged	His   MBP	Human	E.coli
MAPK1	MAPK1-28700TH	Recombinant Human MAPK1, His-tagged	His	Human	E.coli
	MAPK1-385H	Recombinant Human MAPK1 Protein, MYC/DDK-tagged	Myc   DDK	Human	HEK293
	MAPK1-7267H	Recombinant Human MAPK1, GST tagged	GST	Human	Insect Cell

