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Recombinant Proteins

- High Purity
- Full Range Sizes
- Superior Biological Activity
- GMP-grade Proteins

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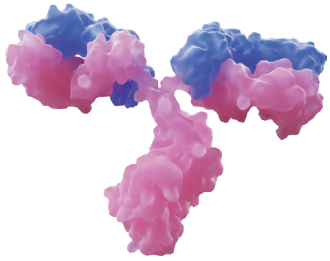
Recombinant Proteins

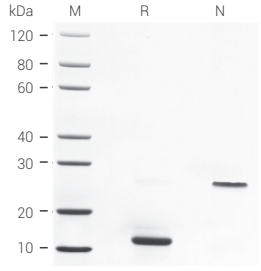
MedChemExpress (MCE) provides a comprehensive catalog of recombinant proteins with various tags, multiple species, excellent lot-to-lot consistency, superior biological activity and certified low levels of endotoxin to meet the needs of all types of customers. MCE's recombinant proteins include: cytokines and growth factors, viral proteins, immune checkpoint proteins, CAR-T related proteins, CD antigens, receptor proteins and enzymes. MCE's recombinant proteins have been cited in research articles covering many different fields and disciplines, such as cell growth and differentiation, cell signaling, biopharmaceutical target discovery, protein structural and functional analyses, etc. By ensuring high-quality products and professional pre-sale and after-sale services, MCE is now being regarded as a partner-of-choice by millions of scientists and technicians.

- **Broad Categories:** Cytokines and Growth Factors, Immune Checkpoint Proteins, CAR-T Related Proteins, CD Antigens, Fc Receptor Proteins, Receptor Proteins, Enzymes & Regulators, Complement System Related Proteins, Ubiquitin Related Proteins, Biotinylated Proteins, Viral Proteins, GMP-grade Proteins
- **Low Endotoxin Levels:** Measured by LAL assay
- **High Purity:** Tested by SDS-PAGE & HPLC
- **Superior Biological Activity:** Validated by relevant in vitro or in vivo assays
- **Excellent Lot-to-Lot Consistency:** Confirmed by Lot-to-Lot data
- **Full Range Sizes:** Different pre-packaged sizes for various needs
- **Competitive Price:** High quality with a reasonable price



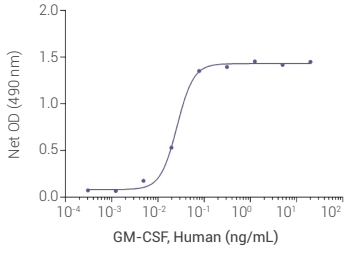
High Purity

The purity of human BMP-2 is greater than 95% as analyzed by SDS-PAGE under reducing (R) and non-reducing (N) condition.



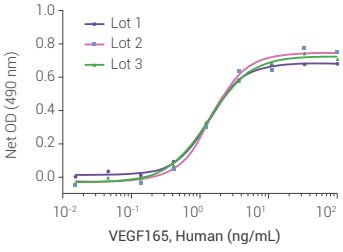
Superior Biological Activity

Human GM-CSF stimulates cell proliferation of TF-1 cells with an ED_{50} of less than 0.5 ng/mL.



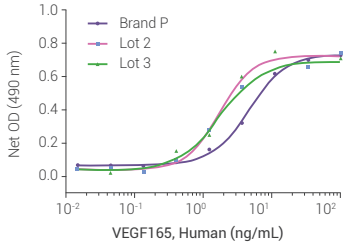
Excellent Lot-to-Lot Consistency

The ED_{50} of MCE human VEGF165 from three different Lots are similar.



Activity Comparison

The ED_{50} of human VEGF165 from MCE's each Lot is lower than of Competitor P.



Publications Citing Use of MCE Products

Nature. 2022 Jun;606(7915):776-784.

Nature. 2022 May;605(7911):747-753.

Nature. 2022 May;605(7909):325-331.

Nature. 2022 Apr;604(7906):541-545.

Nature. 2022 Apr;604(7904):160-166.

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Science. 2021 Nov 26;374(6571):1099-1106.

Science. 2021 Oct;374(6563):eabf3067.

Science. 2021 Jul 30;373(6554):547-555.

Science. 2021 Apr 30;372(6541):eaba8490.

Science. 2021 Mar 5;371(6533):eabb2224.

...

Cell. 2022 Jun 9;S0092-8674(22)00651-1.

Cell. 2022 May 11;S0092-8674(22)00526-8.

Cell. 2022 Apr 28;185(9):1521-1538.e18.

Cell. 2022 Jan 6;185(1):158-168.e11.

Cell. 2021 Oct 28;184(22):5670-5685.e23.

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MCE Global Partners

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Reconstitution and Storage

1 Centrifuge the tube before opening

During shipment, the protein may adhere to the wall or cap of the vial. Before opening the vial, please centrifuge at 10,000-12,000 rpm for 30 seconds to gather the protein at the bottom of the vial. If a high-speed centrifuge is not available, please centrifuge at 3,000-3,500 rpm for 5 mins.

2 After centrifugation, add the reconstitution buffer to the lyophilized protein powder and mix gently by pipetting. Resuspend in the reconstitution buffer to recommended concentration (no less than 100 μg/mL).

Note: Vigorous vortexing should be avoided as it can cause protein foaming and denaturation, thereby affecting the protein activity.

3 Once reconstituted, recombinant proteins can be stored no more than a week at 2-8°C.

For experiments with a short cycle (no more than 7 days), the recombinant protein solution can be directly added to the culture system and used up within a week. If the experimental concentration is lower than the reconstituted concentration, dilution can be done with a solution containing carrier proteins.

4 For long-term storage, the protein solution should be diluted further with carrier proteins (0.1% BSA, 5% HAS, 10% FBS or 5% trehalose), and then aliquot and stored at -20°C to -80°C.

It is not recommended to freeze the reconstituted product directly at -20°C to -80°C. Some recombinant proteins may stick to the plastic tube wall easily, which results in a lower concentration of protein in the solution and ultimately reduces its activity. Carrier proteins can prevent products from sticking to the tube wall by pre-blocking the protein binding site. Therefore, for long-term storage, cytokines or proteins should be further diluted with the solution containing carrier proteins before making aliquots and freezing.

Note: Avoid repeated freeze/thaw cycles. Each freeze/thaw cycle will cause denaturation or conformational changes in some proteins, thereby reducing the binding ability of antibodies and accelerating protein degradation.

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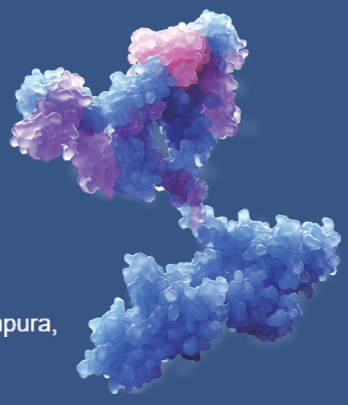

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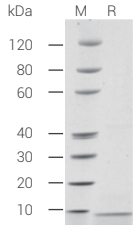
Cytokines and Growth Factors

Cytokines are a large class of low molecular weight proteins, peptides, or glycoproteins that are secreted by various types of immune cells such as macrophages and lymphocytes, as well as other cell types such as endothelial cells. They play an important role in regulating cell growth, differentiation, and activation and are involved in many aspects of the innate and adaptive immune response[1][2][3]. Growth factors are soluble signaling molecules that stimulate various cellular processes during development and tissue healing, including cell proliferation, migration, differentiation, and multicellular morphogenesis[4][5]. The terms "growth factors" and "cytokines" are often used interchangeably[5][6].

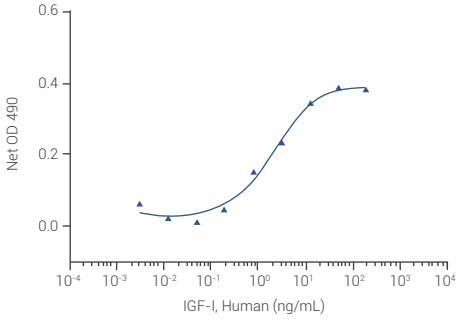
Human IGF-I (HY-P7018)

The purity of human IGF-I is greater than 95% as analyzed by SDS-PAGE under reducing (R) conditions.



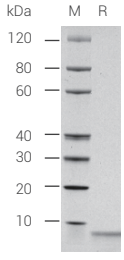
Human IGF-I (HY-P7018)

The ED_{50} of human IGF-I is < 5.0 ng/ml as measured by FDC-P1 cells, corresponding to a specific activity of >2.0 × 10^5 units/mg.



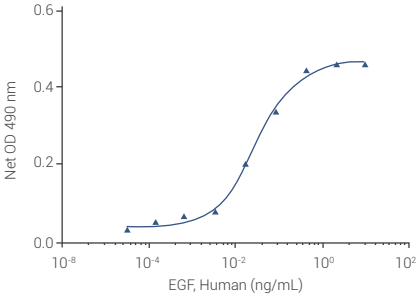
Human EGF (HY-P7109)

The purity of human EGF is greater than 95% as analyzed by SDS-PAGE under reducing (R) conditions.



Human EGF (HY-P7109)

The ED_{50} of human EGF is <0.2 ng/mL as measured by murine BALB/c 3T3 cells, corresponding to a specific activity of 5.0 × 10^6 units/mg.



Cat. No.	Product Name	Species	Source	Tag
HY-P7080	IL-4	Mouse	Mammalian Cells	Tag-free
HY-P7223	IL-6R alpha	Human	Mammalian Cells	Tag-free
HY-P7025	IFN-gamma	Human	*E.coli*	Tag-free
HY-P7287	SDF-1 beta/CXCL12	Human	*E.coli*	Tag-free

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Cat. No.	Product Name	Species	Source	Tag
HY-P7058	TNF-alpha/TNFSF2	Human	*E.coli*	Tag-free
HY-P7085	M-CSF	Mouse	*E.coli*	Tag-free
HY-P7118	TGF beta 1	Human	Mammalian Cells	Tag-free
HY-P7086	Noggin	Mouse	Mammalian Cells	Tag-free
HY-P7007	BMP-4	Human	*E.coli*	Tag-free
HY-P70593	Fibronectin	Human	*E.coli*	Tag-free
HY-P70453	Wnt3a	Human	Mammalian Cells	Tag-free
HY-P7109	EGF	Human	*E.coli*	Tag-free
HY-P70311	Activin A	Human/Mouse/Rat	Mammalian Cells	Tag-free
HY-P7319	AITRL/TNFSF18	Mouse	*E.coli*	Tag-free
HY-P75509	Angiopoietin-2	Canine	Mammalian Cells	N-His
HY-P72650	FGF-21	Cynomolgus	Mammalian Cells	C-His
HY-P72106	BMP1	Human	*E.coli*	N-His
HY-P71827	Adiponectin/ADIPOQ	Bovine	*P.pastoris*	N-His
HY-P7008	BMP-7	Human	*E.coli*	Tag-free
HY-P7257	CCL4	Human	*E.coli*	Tag-free
HY-P70450	CCL5	Human	*E.coli*	Tag-free
HY-P7143	CCL6	Mouse	*E.coli*	Tag-free
HY-P7772	CCL9	Mouse	*E.coli*	Tag-free
HY-P70138	DLK-1	Human	Mammalian Cells	C-His
HY-P7004	FGF basic/bFGF	Human	*E.coli*	Tag-free
HY-P7170	FGF-10	Mouse	*E.coli*	Tag-free
HY-P7346	FGF-8	Human	*E.coli*	Tag-free
HY-P7015A	G-CSF	Human	Mammalian Cells	Tag-free
HY-P7016	GM-CSF	Human	Mammalian Cells	Tag-free
HY-P7017	HB-EGF	Human	*E.coli*	Tag-free
HY-P7018	IGF-I	Human	*E.coli*	Tag-free
HY-P7368	IGFBP-2	Human	Mammalian Cells	C-His
HY-P7027	IL-1 alpha	Human	*E.coli*	Tag-free
HY-P7030A	IL-10	Human	Mammalian Cells	Tag-free
HY-P7049	LIF	Human	*E.coli*	Tag-free
HY-P7051A	Noggin	Human	Mammalian Cells	Tag-free
HY-P70781	SCF	Human	*E.coli*	Tag-free
HY-P70467	SHH	Human	*E.coli*	Tag-free

Immune Checkpoint Proteins

Immune checkpoint (ICP) molecules are ligand-receptor pairs that have an inhibitory or stimulatory effect on the immune response. Most of the ICP proteins that have been described are expressed on cells of the adaptive immune system. ICP proteins act as important immune regulators in maintaining immune homeostasis and immune tolerance, and some cancer cells can bind co-inhibitory receptor molecules to limit the normal anti-tumor immune response, thereby assisting immune escape. ICP therapy for cancer includes strategies that target these regulatory pathways to reinvigorate the anti-tumor function of immune cells[7][8].

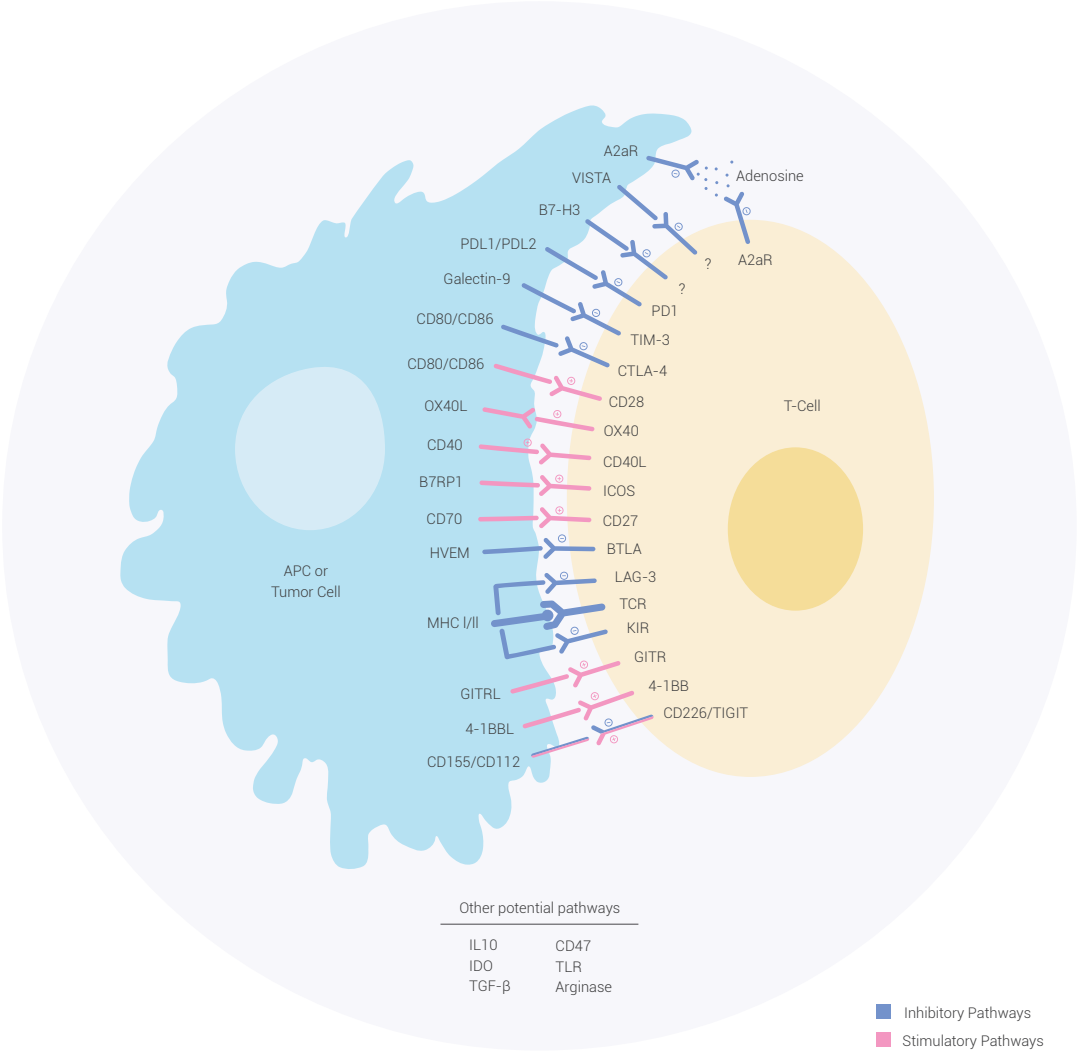

Figure 1. Common inhibitory and stimulatory immune checkpoint pathways[9]

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Cat. No.	Product Name	Species	Source	Tag
HY-P70691	CTLA-4	Human	Mammalian Cells	C-GST
HY-P70632	PD-L1	Mouse	Mammalian Cells	C-His
HY-P7395	PD-1	Human	Mammalian Cells	C-hFc
HY-P70482	TIM3	Human	Mammalian Cells	C-His
HY-P70722	LAG-3	Human	Mammalian Cells	C-His
HY-P70624	TIGIT	Human	Mammalian Cells	C-His
HY-P7327	CD276/B7-H3	Human	Mammalian Cells	C-His
HY-P7446	4-1BBL/TNFSF9	Mouse	Mammalian Cells	N-His
HY-P7144	CD40L/CD154/TRAP	Human	*E.coli*	Tag-free
HY-P70652	CD276/B7-H3	Human	Mammalian Cells	C-His
HY-P7678	BTLA/CD272	Human	Mammalian Cells	C-His
HY-P7685	BTN3A3	Human	Mammalian Cells	C-His
HY-P70535	Galectin-9	Human	Mammalian Cells	C-His
HY-P7366	HVEM	Human	Sf9 insect Cells	C-hFc
HY-P70494	Nectin-1	Human	Mammalian Cells	C-His
HY-P70807	PVR/CD155	Human	Mammalian Cells	C-His
HY-P73370	PD-L2	Rat	Mammalian Cells	C-hFc
HY-P77879	VISTA	Human	Mammalian Cells	C-hFc
HY-P75610	CD137/4-1BB	Canine	Mammalian Cells	C-His
HY-P7394	OX40/TNFRSF4	Human	Mammalian Cells	C-His
HY-P77457	OX40 Ligand/TNFSF4	Cynomolgus	Mammalian Cells	N-mFc
HY-P73499	CD40	Human	Mammalian Cells	C-His
HY-P73306	Nectin-3	Human	Mammalian Cells	C-His
HY-P71248	PVRIG	Human	Mammalian Cells	C-mFc
HY-P76070	SIRP alpha	Mouse	Mammalian Cells	C-His
HY-P73121	IDO	Human	*E.coli*	Tag-free
HY-P76396	ICOS	Human	Mammalian Cells	C-His-hFc
HY-P77575	ICOSLG	Cynomolgus	Mammalian Cells	C-His
HY-P72353	CD28	Human/Cynomolgus	Mammalian Cells	C-Fc-Avi
HY-P72033	LIGHT	Human	Mammalian Cells	N-hFc-Myc
HY-P73076	GITR	Human	Mammalian Cells	C-His
HY-P7318	GITRL/AITRL	Human	*E.coli*	Tag-free
HY-P72887	CD200	Human	Mammalian Cells	C-hFc
HY-P76780	CD200R1	Cynomolgus	Mammalian Cells	C-His

CAR-T Related Proteins

Chimeric antigen receptor T (CAR-T) cells, genetically engineered to express synthetic chimeric antigen receptors, can specifically target antigens and kill tumor cells[10][11]. CAR-T cells can specifically recognize their target antigens through single-stranded fragment variant (scFv) binding domains, leading to T cells in a major histocompatibility complex (MHC)-independent manner activation. Therefore, in CAR design, antigen selection is critical for killing target tumor cells[12].

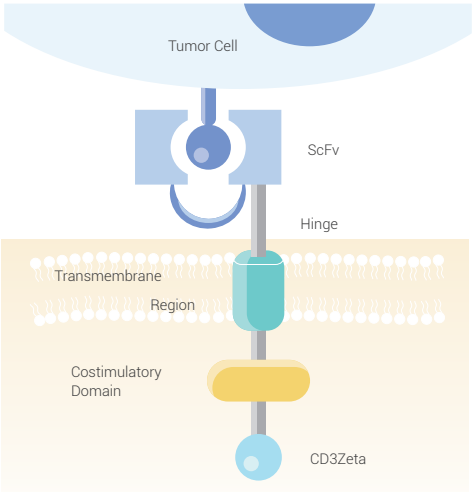

Figure 2. A diagram of a CAR[13]

Cat. No.	Product Name	Species	Source	Tag
HY-P7656	BCMA/TNFRSF17	Mouse	Mammalian Cells	C-Fc
HY-P72019	Siglec-2/CD22	Human	Mammalian Cells	C-His
HY-P70505	CD19	Human	Mammalian Cells	C-Fc
HY-P70731	CD38	Human	Mammalian Cells	C-His
HY-P70148	Mesothelin	Human	Mammalian Cells	C-His
HY-P70189	EGFR vIII`	Human	Mammalian Cells	C-His
HY-P70125	CD276/B7-H3	Cynomolgus	Mammalian Cells	C-His
HY-P70155	EpCAM/TROP1	Human	Mammalian Cells	C-Fc
HY-P70759	HER2/CD340	Human	Mammalian Cells	C-Fc
HY-P70301	Mucin-1	Human	Mammalian Cells	C-Fc
HY-P71031	Siglec-6	Human	Mammalian Cells	C-Fc
HY-P70487	Glypican-3/GPC3	Human	Mammalian Cells	C-His
HY-P70296	Folate receptor alpha	Human	Mammalian Cells	C-His
HY-P70497	CD7	Human	Mammalian Cells	C-His

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CD Antigens

Cluster of differentiation (CD) antigens are cell surface molecules that can be used to identify and investigate their presence in leukocytes. Some CD antigens frequently act as cell-cell or cell-matrix adhesion molecules, cytokine receptors, ionophores, or nutrient transporters. CD antigens are routinely used as cellular markers that can be used to identify and isolate the presence and proportion of specific leukocyte populations and lymphocyte subpopulations using fluorescently labeled antibodies[14][15].

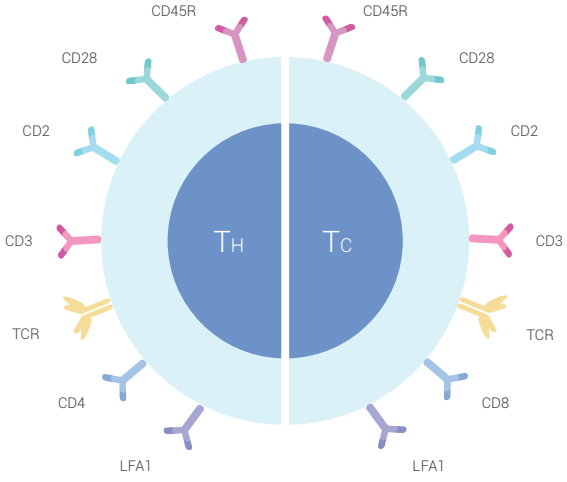

Figure 3. CD antigens of T cells[16]

Cat. No.	Product Name	Species	Source	Tag
HY-P70090	CD3 epsilon	Cynomolgus	Mammalian Cells	C-Fc
HY-P72702	CD8 beta	Human	Mammalian Cells	N-His
HY-P70486	CD28	Human/Cynomolgus	Mammalian Cells	N-His
HY-P7321	B7-1/CD80	Human	Mammalian Cells	C-hFc
HY-P70029	Basigin/CD147	Human	Mammalian Cells	C-His
HY-P70507	CD44	Human	Mammalian Cells	C-His
HY-P7679	BTLA/CD272	Human	Mammalian Cells	C-Fc
HY-P7780	Nectin-2/CD112	Human	Mammalian Cells	C-His
HY-P7785	CD127/IL-7RA	Human	Mammalian Cells	C-Fc-His
HY-P70550	CD137/4-1BB	Cynomolgus	Mammalian Cells	C-His
HY-P7799	CD160	Mouse	Mammalian Cells	C-His
HY-P70479	CD40	Human	Mammalian Cells	C-His
HY-P7819	CD207	Human	Mammalian Cells	N-His

Fc Receptor Proteins

Receptors of the fragment crystalizable (Fc) portion of immunoglobulin (Fc receptors, FcRs) are membrane molecules that are expressed on most innate and adaptive immune cells. FcRs belong to the immunoglobulin superfamily and interact with the Fc portion of antibodies to link humoral immune responses to cellular effector mechanisms. Receptors for all classes of immunoglobulins include IgG (FcγRI/CD64, FcγRII/CD32, Fcγ RIII/CD16, and FcRn), IgE (FCεRI, FcεRII), IgA (FcαRI/CD89), IgM (FcμR), IgD (FcδR) and IgA/IgM (Fcα/μR)[17][18].

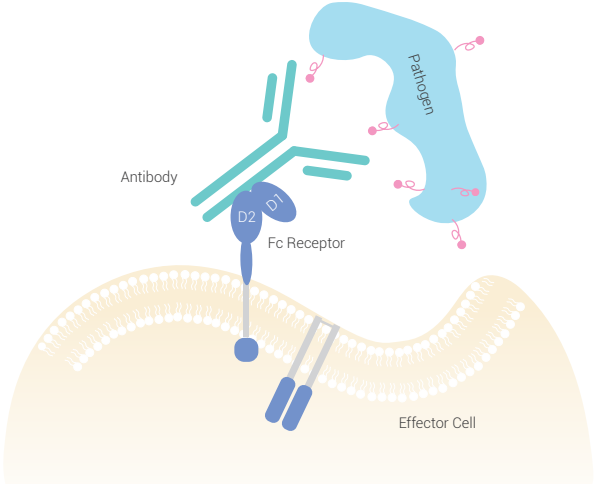

Figure 4. Schematic illustration of Fc receptor interaction with an antibody-coated microbial pathogen[19]

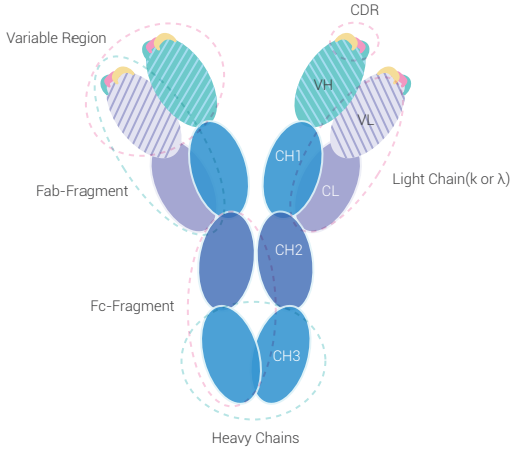

Figure 5. Schematic figure of IgG[20]

Cat. No.	Product Name	Species	Source	Tag
HY-P70708	Fc gamma RIII/CD16	Mouse	Mammalian Cells	C-His
HY-P70490	Fc gamma RIIIA/CD16a	Human	Mammalian Cells	C-His
HY-P72657	FCAR/CD89	Human	Mammalian Cells	C-His
HY-P70711	Fc gamma RIIA/CD32a	Rat	Mammalian Cells	C-His
HY-P70669	CD64	Human	Mammalian Cells	C-His
HY-P70601	FCRN	Human	Mammalian Cells	C-His
HY-P72748	CD23/Fc epsilon RII	Human	Mammalian Cells	N-His
HY-P76800	Fc gamma RIIB/CD32b	Cynomolgus	Mammalian Cells	C-His
HY-P75204	Fc gamma RIIIB/CD16b	Human	*E.coli*	Biotinylated
HY-P72191	Fc epsilon RIA/FCER1A	Human	*E.coli*	His-SUMO
HY-P77363	FCAMR/CD351	Mouse	Mammalian Cells	C-His
HY-P70251	IgG3 Fc	Mouse	Mammalian Cells	Tag-free
HY-P72603	IgG2A Fc	Mouse	Mammalian Cells	Tag-free

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Receptor Proteins

Receptors are protein molecules located on the cell surface or within the cytoplasm which are able to specifically recognize and bind to ligand molecules[21]. They are coupled to various signal transduction systems located both within the cell membrane and intracellularly, and can therefore regulate responses to the cellular/tissue microenvironment. Receptors are the molecular targets through which drugs produce their beneficial effects in various disease states[22][23].

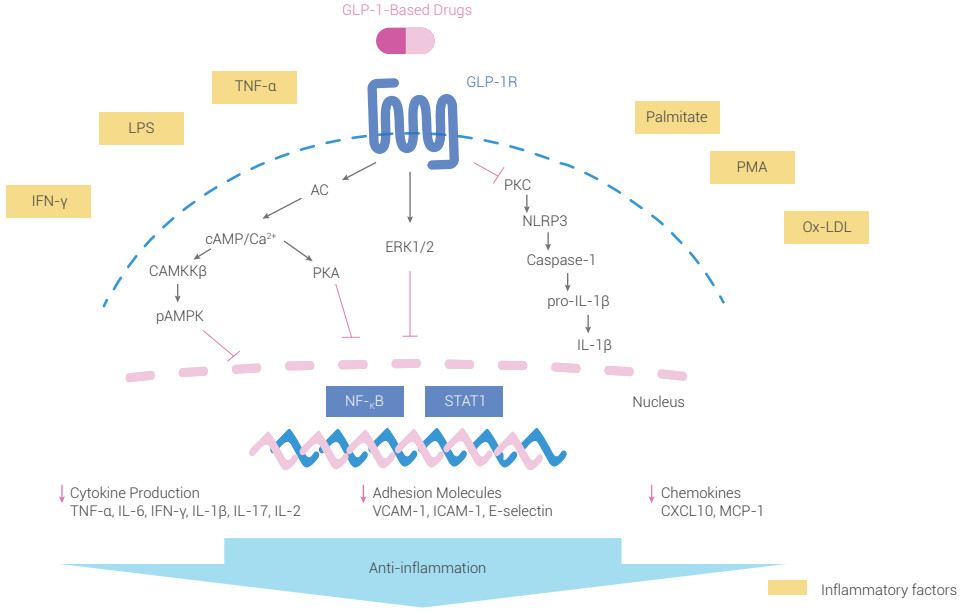

Figure 6. Molecular signals underlying the anti-inflammatory effects of GLP1-GLP1R-based drugs[24]

Cat. No.	Product Name	Species	Source	Tag
HY-P70552	VEGFR-2	Human	Mammalian Cells	C-His
HY-P70714	HGFR	Human	Mammalian Cells	C-His
HY-P70352	GLP1R	Human	Mammalian Cells	C-Fc
HY-P70793	TrkB	Human	Mammalian Cells	C-His
HY-P7308	TrkA	Human	Mammalian Cells	Tag-free
HY-P70179	LIR-1/LILRB1	Human	Mammalian Cells	C-His
HY-P7485	Activin RIB/ALK-4	Human	Mammalian Cells	C-His
HY-P7467	AGER	Human	Mammalian Cells	C-His
HY-P71580	GFRAL	Human	*E.coli*	N-His-SUMO
HY-P72198	FSHR	Human	*E.coli*	N-His
HY-P70057	TYRO3/DTK	Mouse	Mammalian Cells	C-His

Enzymes & Regulators

Enzymes are biocatalysts found in biological systems that catalyze specific biochemical processes, and most enzymes are proteins. Many inherited human diseases, such as albinism and phenylketonuria, are caused by deficiencies in specific enzymes. The reactions catalyzed by enzymes can be inhibited by foreign or endogenous inhibitors. Many toxins and pharmacologically active substances act by inhibiting specific enzyme-catalyzed reactions[25][26][27].

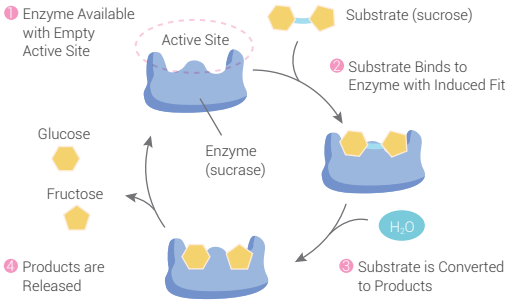

Figure 7. Enzymatic catalysis[28]

Cat. No.	Product Name	Species	Source	Tag
HY-P7745	Cathepsin A	Human	Mammalian Cells	C-His
HY-P7442	ACE2	Human	Mammalian Cells	C-Fc
HY-P70351	MMP-9	Mouse	Mammalian Cells	C-His
HY-P70051	Aminopeptidase N/CD13	Mouse	Mammalian Cells	C-His
HY-P7474	ALDH1A1	Human	*E.coli*	N-His
HY-P7734	Carboxypeptidase B1/CPB1	Human	Mammalian Cells	C-His
HY-P70005	CTRB1	Human	Mammalian Cells	C-His
HY-P70010	CD73/5'-Nucleotidase	Human	Mammalian Cells	C-His
HY-P7452	ACOT13	Human	Mammalian Cells	C-His
HY-P70221	Acyl-protein thioesterase 2/LYPLA2	Human	*E.coli*	C-His
HY-P7479	Aldose 1-epimerase/GALM	Human	*E.coli*	C-His
HY-P72076	ALOX12	Human	*E.coli*	N-His
HY-P70260	Alpha-enolase/Enolase 1	Human	*E.coli*	C-His
HY-P73090	GSK-3 beta	Mouse	*E.coli*	N-His
HY-P7503	Angiogenin	Human	*E.coli*	Tag-free
HY-P73267	Kininogen-1	Mouse	Mammalian Cells	C-His
HY-P7602	Arginase-1	Human	Mammalian Cells	C-His

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Complement System

Complement system, a complex network of plasma proteins that can be activated directly by invading pathogens or indirectly by pathogen-bound antibodies, plays a key role in host homeostasis, inflammation, and defense against pathogens. The complement system can be activated through three main pathways: the classical pathway (CP), the lectin pathway (LP), and the alternative pathway (AP). The initiation of these pathways depends on the final effector molecules: innocuous toxins (C4a/C3a/C5a), membrane attack complexes (MAC), and proteases (e.g. C3b)[29].

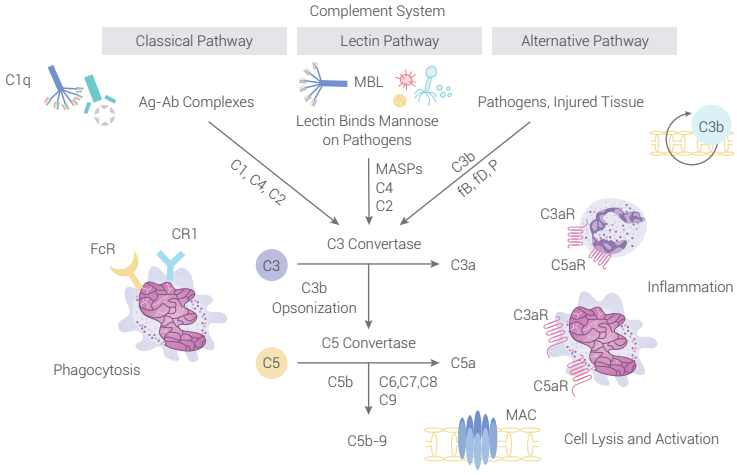

Figure 8. Complement System[30]

Cat. No.	Product Name	Species	Source	Tag
HY-P7863	Complement C3/C3a	Mouse	*E.coli*	Tag-free
HY-P7864	Complement C5/C5a	Human	*E.coli*	Tag-free
HY-P70031	CFHR2	Human	Mammalian Cells	C-His
HY-P70055	CFHR1	Human	Mammalian Cells	C-His
HY-P70102	CFHR5	Human	Mammalian Cells	C-His
HY-P7692	HABP1/C1QBP	Human	*E.coli*	C-His
HY-P71718	C1QA	Mouse	*P.pastoris*	N-His
HY-P71423	VSIG4	Human	Mammalian Cells	C-Fc
HY-P7890	Complement factor H/CFH	Human	Mammalian Cells	C-His
HY-P74371	C7/Complement component C7	Human	Mammalian Cells	C-His
HY-P74375	C2/Complement C2	Human	Mammalian Cells	C-His
HY-P74614	Protein S/PROS1	Human	Mammalian Cells	C-His
HY-P75464	C1QB	Human	Sf9 Insect Cells	C-His

Ubiquitin Related Proteins

Ubiquitin (Ub) is a small, highly conserved protein containing 76 amino acids that are ubiquitously expressed in eukaryotic cells. The covalent attachment of ubiquitin to target proteins is known as ubiquitination. Ubiquitination requires three distinct steps, which are ① activation of ubiquitin by Ub activase (E1), ② transfer of activated ubiquitin from E1 to the cysteine residues of Ub-binding enzyme (E2), and ③ attachment of ubiquitin to the lysine residues of the target protein by Ub ligase (E3)[31][32][33].

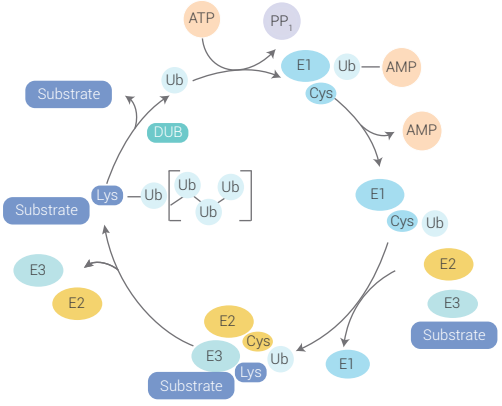

Figure 9. The ubiquitin (U)-protein conjugation cycle[34]

Cat. No.	Product Name	Species	Source	Tag
HY-P70843	NEDD8	Human	*E.coli*	Tag-free
HY-P71016	UBE2C	Human	*E.coli*	N-His
HY-P71020	UBE2L6	Human	*E.coli*	C-His
HY-P71096	UCH-L1	Human	*E.coli*	C-His
HY-P71101	UBB	Human	*E.coli*	Tag-free
HY-P70974	SUMO2	Human	*E.coli*	N-His
HY-P7617	ATG3	Human	*E.coli*	Tag-free
HY-P71182	OTUB2	Human	*E.coli*	N-GST
HY-P71396	UBAP1	Human	*E.coli*	C-His
HY-P73537	XIAP	Human	*E.coli*	N-His
HY-P71643	SAE1	Human	*E.coli*	N-GST
HY-P70149	ISG15/UCRP	Human	*E.coli*	C-His
HY-P71395	UBA5	Human	*E.coli*	N-His
HY-P71402	UBE2H	Human	*E.coli*	N-GST
HY-P71407	UBE2R2	Human	*E.coli*	N-His

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Viral Proteins

A complete infectious viral particle, called a virosome, consists of nucleic acid (DNA or RNA) and a capsid protein. The viral proteins of a mature assembled viral particle are known as viral structural proteins and may include core proteins of the core-shell (Gag proteins), enzymes packaged within the viral particle (Pol proteins), and membrane components (Env proteins). In addition, viral proteins include nonstructural proteins, regulatory proteins, and accessory proteins.

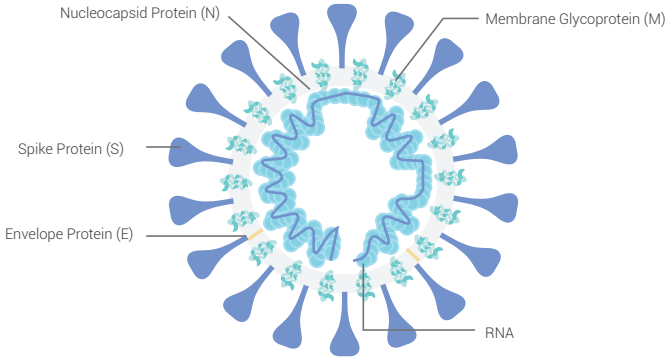

Figure 10. SARS-COV-2 structure[38]

Cat. No.	Product Name	Species	Source	Tag
HY-P7429	3C-like Proteinase	SARS-CoV-2	*E.coli*	N-His
HY-P7437	Nucleocapsid	SARS-CoV-2	*E.coli*	N-His
HY-P7436	S1 Protein	SARS-CoV-2	Mammalian Cells	Tag-free
HY-P70127	NSP1	SARS-CoV-2	*E.coli*	C-His
HY-P73290	Spike/S1	MERS-CoV	Sf9 insect Cells	C-His
HY-P70907	Envelope glycoprotein gp120	HIV-1	Mammalian Cells	C-His
HY-P74883	gp140	HIV-1	Mammalian Cells	C-Fc
HY-P70015	B18R	Vaccinia virus	Mammalian Cells	C-His
HY-P71478	Fusion glycoprotein F0/F	HRSVA	*E.coli*	N-His, B2M
HY-P73232	HA/Hemagglutinin	Influenza virus	Mammalian Cells	C-His
HY-P73239	NA/Neuraminidase	Influenza virus	Mammalian Cells	Tag-free
HY-P73533	Membrane protein	Zika virus	Mammalian Cells	C-Fc
HY-P73738	NS1 Protein	Dengue virus	Mammalian Cells	N-His
HY-P74188	E/Envelope Protein	West Nile Virus	*P.pastoris*	C-His
HY-P74354	Capsid protein	Hepatitis virus	*E.coli*	C-His

Biotinylated Proteins

Biotinylation is the process of covalently attaching biotin to a molecule, such as an amino acid. In general, biotinylation is rapid, specific, and unlikely to affect the natural function of the molecule due to the small size of biotin. Biotin is widely used in biomedical sciences due to its high affinity, rapid conductivity, and high specificity for binding to streptavidin/avidin. Importantly, biotinylated proteins are widely used as molecular tools in biotechnological applications[39].

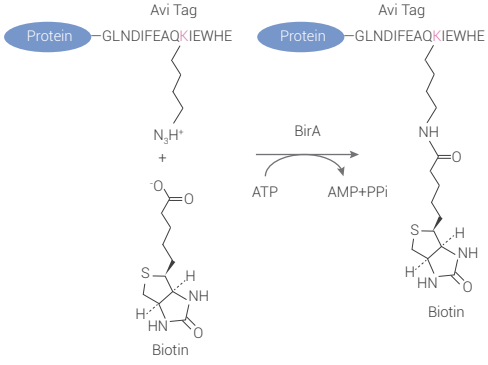

Figure 11. Avi-tagged target protein biotinylated by BirA[40]

Cat. No.	Product Name	Species	Source	Tag
HY-P70546	PCSK9	Human	Mammalian Cells	C-His-HA-Avi
HY-P70721	PD-L1	Human	Mammalian Cells	C-Fc-Avi
HY-P70767	Siglec-15	Human	Mammalian Cells	C-Fc-Avi
HY-P70768	CD79B	Human	Mammalian Cells	C-His-Avi
HY-P70769	ACE2	Human	Mammalian Cells	C-His-Avi
HY-P70770	TROP-2	Human	Mammalian Cells	C-His-Avi
HY-P71175	NTNG1	Human	Mammalian Cells	C-Avi-His
HY-P71056	TGF beta 1	Human	Mammalian Cells	N-Avi
HY-P71421	VEGFR-2	Human	Mammalian Cells	C-His-Avi
HY-P73309	Neuropilin-1	Human	Mammalian Cells	C-His-Avi
HY-P73485	XIAP	Human	*E.coli*	N-Avi
HY-P72882	4-1BBR/TNFRSF9	Human	Mammalian Cells	C-hFc-Avi
HY-P72909	CD40	Human	Mammalian Cells	C-hFc-Avi
HY-P72885	Fc gamma RIIIA/CD16a	Human	Mammalian Cells	C-His-Avi
HY-P72343	BTN1A1	Human	Mammalian Cells	C-His-Avi
HY-P72389	LAG-3	Human	Mammalian Cells	C-His-Avi

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GMP-grade Proteins

MedChemExpress GMP (Good Manufacturing Practice) recombinant proteins are manufactured under specific guidelines to ensure product quality and consistency. The use of high-quality media supplements, such as growth factors and cytokines, is essential to ensure safety, efficacy, and minimize batch-to-batch variation. We offer GMP-grade recombinant proteins produced with quality documentation and full traceability, manufactured under independent QA oversight.

Each lot of our GMP-grade recombinant proteins undergoes rigorous QC testing tests:

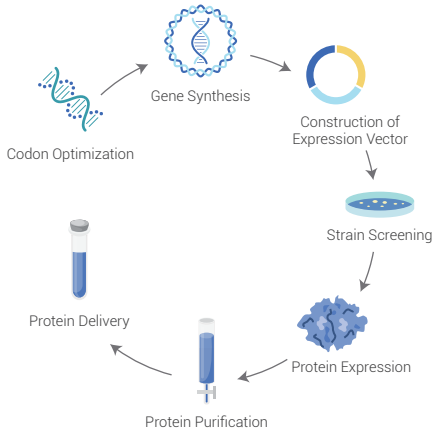
Biological Activity Validation	Residual Host Cell DNA Content Analysis
Purity Testing by HPLC analysis and SDS-PAGE	Residual Host Cell Protein Content Analysis
Stability Testing	Mycoplasma Testing
Endotoxin Testing	Other tests depending on specific needs
Molecular weight determination by SDS-PAGE	

MCE GMP recombinant proteins can be used as raw material or auxiliary reagent in cell culture (cell expansion, polarization, and differentiation) or in other biological processes *in vitro*.

Cat. No.	Product Name	Species	Source	Tag
HY-P70637G	GMP TPO	Human	Mammalian cells	C-His
HY-P70757G	GMP SCF	Human	Mammalian cells	C-His
HY-P70454G	GMP IL-1 alpha	Human	*E.coli*	Tag-free
HY-P7044G	GMP IL-6	Human	*E.coli*	Tag-free
HY-P7032G	GMP IL-12	Human	Mammalian Cells	Tag-free
HY-P70760G	GMP IL-18	Human	Mammalian Cells	C-His
HY-P7038G	GMP IL-21	Human	*E.coli*	Tag-free
HY-P7055G	GMP PDGF-BB	Human	*E.coli*	Tag-free
HY-P70567G	GMP GM-CSF	Human	Mammalian Cells	C-His
HY-P70576G	GMP IL-3	Human	*E.coli*	N-His
HY-P70593G	GMP Fibronectin	Human	*E.coli*	Tag-free
HY-P70610G	GMP IFN gamma	Human	Mammalian Cells	Tag-free
HY-P70544G	GMP FLT3LG	Human	Mammalian Cells	C-His
HY-P70440G	GMP FGF basic/bFGF	Human	*E.coli*	Tag-free
HY-P70755G	GMP IL-7	Human	Mammalian Cells	C-His
HY-P70783G	GMP IGF-I/IGF-1	Human	*E.coli*	Tag-free
HY-P7109G	GMP EGF	Human	*E.coli*	Tag-free

Recombinant Protein Expression Service

- One-stop service from construct design to protein delivery
- Independently developed high expression vectors and strains
- Professional R & D team for recombinant protein
- Customized services of high-purity productions from milligram to gram scale
- Large-scale protein production platform



Service Types

MCE has five technical service platforms: E.coli expression system, yeast expression system, mammalian expression system, insect expression system and inclusion body protein renaturation.

Project	Content	Cycle	Deliverable
E.coli Expression System	Construction of Expression Vector	1-2 weeks	Expression Plasmid / Construction Report
	Protein Expression	1 week	Expression Report
	Flask Fermentation and Protein Purification	3 weeks	All Qualified Proteins / Purification Report
Inclusion Body Protein Renaturation	Construction of Expression Vector	1-2 weeks	Sequencing Report
	Protein Expression	1 week	Expression Report
	Small-scale Protein Renaturation	2-3 weeks	Refolding Protein
	Mass Protein Production	2-4 weeks	mg-g Level Refolding Protein
Yeast Expression System	Construction of Expression Vector	1-2 weeks	Construction Report
	Electrotransformation	2 weeks	5 Positive Strains
	Screening of High Copy Strains	1 week	1 High Copy Strain
	Protein Expression	3 weeks	Expression Report
	Protein Purification	3 weeks	Protein/Purification Report
Mammalian Expression System	Construction of Expression Vector	1-2 weeks	Construction Report
	HEK293/CHO Cell Transfection and Expression Detection	3 weeks	Expression Report
	1L HEK293/CHO Cell Transfection and Protein Purification	3 weeks	All Qualified Proteins / Purification Report
Insect Expression System	Construction of Expression Vector	2 weeks	Construction Report
	Preparation of Bacmid	1 week	Preparation Report
	Cell Transfection and Expression Detection	4-5 weeks	Expression Report
	Protein Purification	4 weeks	Protein / Purification Report

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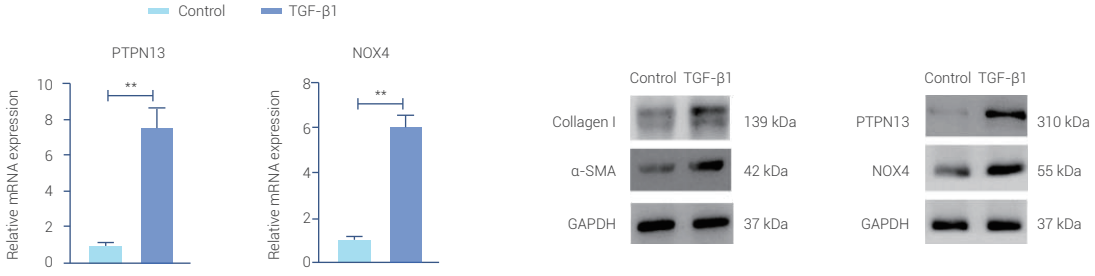
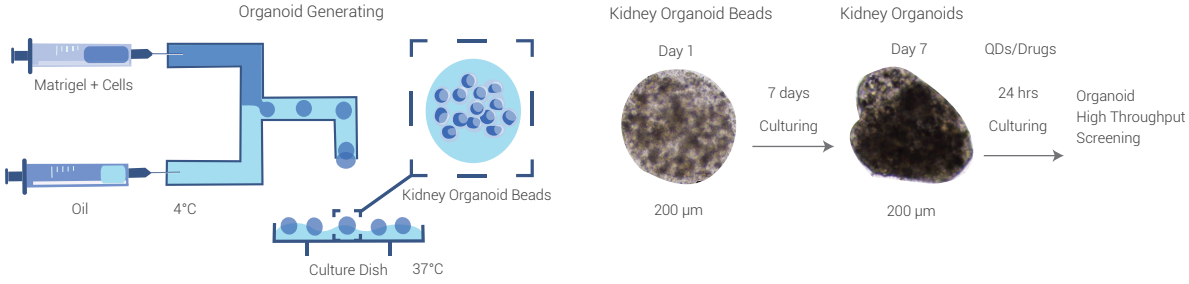
Customer Validation

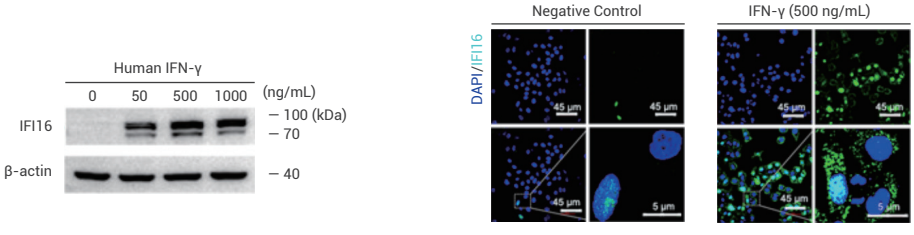
Primary mouse pulmonary fibroblasts were treated with **TGF-β1 (HY-P7117)** to induce (myo) fibroblastic differentiation. The mRNA levels of PTPN13 and NOX4 in the (myo) fibroblasts were significantly increased after treatment, accompanied by increased expression of the (myo) fibroblast marker protein α-SMA[41].



Organoid beads were cultured with supplements of **Noggin (HY-P7086)**, **R-spondin 1 HY-P7114**, **FGF-4 (HY-P7014)**, **FGF-basic (HY-P7066)**, **SB-431542 (HY-10431)**, **Laduviglusib (HY-10182)**. The size, shape, and composition of the kidney organoids were highly reproducible[42].



IFN-γ induced the accumulation of IFI16. The expression of IFI16 in human lung adenocarcinoma epithelial cells (A549) treated with **IFN-γ (HY-P7025)** for 18 h was determined by western blot, and the intracellular localization of IFI16 in A549 cells treated with IFN-γ for 12 h was determined[43].



Selected Publications Citing Use of MCE Recombinant Proteins

Publications	Product Name	Cat. No.
Adv Funct Mater. 2022 Jun. 32(24).	IFN-gamma; IL-13; IL-4	HY-P7071; HY-P7076A; HY-P7080
Signal Transduct Target Ther. 2022 Mar 11;7(1):83.	AXL	HY-P7622
Signal Transduct Target Ther. 2022 Jan 7;7(1):6.	HABP2	HY-P70832
Nat Microbiol. 2021 Jul;6(7):932-945.	IFN-gamma	HY-P7025
Adv Sci (Weinh). 2021 Dec;8(24):e2100808.	NPY	HY-P71063
Cell Death Differ. 2022 Apr;29(4):818-831.	FGF basic; FGF-2	HY-P7004; HY-P7066
Nat Commun. 2022 Feb 23;13(1):1017.	TGF beta 1	HY-P7118
J Immunother Cancer. 2022 Feb;10(2):e003716.	IL-2	HY-P7077
Small. 2020 Jun;16(22):e2001371.	FGF-4; FGF-2; Noggin; RSPO1	HY-P7014; HY-P7066; HY-P7086; HY-P7114
Biomaterials. 2021 Jan;265:120392.	GM-CSF	HY-P7069
Redox Biol. 2021 Jul;43:101994.	IL-6	HY-P7103A
Theranostics. 2022 Jan 1;12(3):1097-1116.	IGF2	HY-P7019
Theranostics. 2022 Jan 1;12(2):747-766.	IFN-gamma	HY-P7025; HY-P7071
Theranostics. 2021 May 13;11(14):7110-7125.	TGF beta 1	HY-P7118
Theranostics. 2021 Jan 9;11(7):3244-3261.	TGF beta 1	HY-P7117
Acta Pharm Sin B. 2020 Sep;10(9):1619-1633.	M-CSF	HY-P7085
J Exp Clin Cancer Res. 2020 Jun 23;39(1):119.	IL-6R alpha	HY-P7223
Biosens Bioelectron. 2020 Sep 19;173:112619.	IFN-gamma	HY-P7025
Cardiovasc Diabetol. 2022 Feb 15;21(1):25.	Asprosin	HY-P7612
J Control Release. 2021 Sep 10;337:417-430.	IL-4; M-CSF; TNF-alpha; MIP-1 alpha; GM-CSF	HY-P7080; HY-P7085; HY-P7090; HY-P7255; HY-P7361
Cell Rep. 2022 Feb 1;38(5):110319.	TNF alpha; GMP IL-6	HY-P70426; HY-P7044G
Cell Rep. 2021 Jan 5;34(1):108576.	IL-1RA	HY-P7029A
Cell Rep. 2020 Jan 7;30(1):98-111.e5.	FGF basic; EGF; VEGF121	HY-P7004; HY-P7109; HY-P7420
Acta Biomater. 2020 Jan 1;101:152-167.	DKK-1	HY-P7155A
Cancer Lett. 2022 Jun 1;535:215629.	BDNF	HY-P7116A
Cancer Lett. 13 July 2021.	FGF basic	HY-P7004
Cell Death Dis. 2021 Apr 14;12(4):397.	NRG1-beta 1	HY-P7365
Cell Death Dis. 2021 Nov 27;12(12):1113.	FGF basic	HY-P7004
Cell Death Dis. 2021 Oct 12;12(10):934.	M-CSF	HY-P7085
Cell Death Dis. 2020 May 7;11(5):323.	TNF-alpha	HY-P7416
Cell Death Dis. 2020 Nov 4;11(11):950.	Insulin; FGF basic; EGF	HY-P0035; HY-P7004; HY-P7109
J Neuroinflammation. 2019 Nov 26;16(1):234.	IL-1RA	HY-P7029

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