



# humankine<sup>®</sup> Cytokines and Growth Factors



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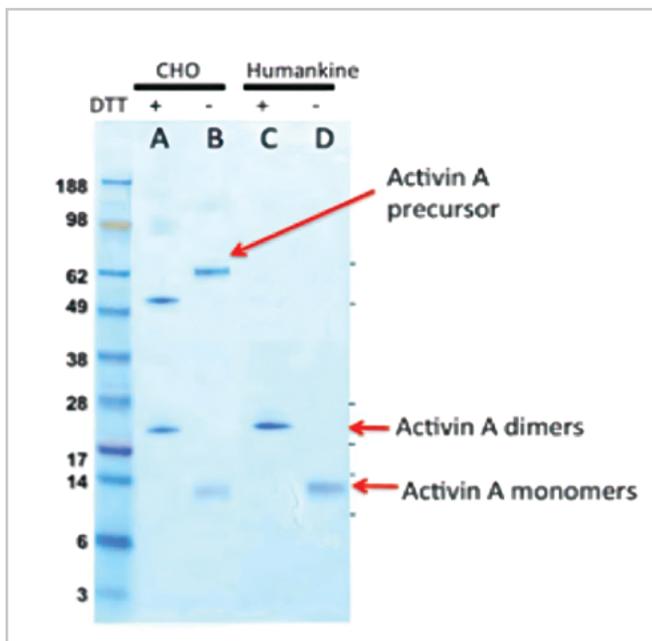
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# Humankine® CYTOKINES AND GROWTH FACTORS

Proteintech offers a wide range of authentic human growth factors and cytokines to facilitate cell culture, stem cell differentiation, wound healing research, and cell therapy manufacturing.

HumanKine recombinant proteins are created in HEK293 cells using animal-free components. Proteins co-expressed in bacteria will not possess post-translational modifications, e.g., phosphorylation or glycosylation. For activity, many proteins require glycosylation and processing available exclusively in eukaryotic systems, specifically human systems.

*Our human expression system ensures that proteins have native conformation and post-translational modifications to optimize biological activity. No expression tags, xeno-free... just high-quality proteins.*



▲ HumanKine Activin A processed into active dimers compared to CHO expressed Activin A with more precursors.

## HumanKine process facilitates...

- Correct processing of prepropeptide to mature bioactive peptide
- Assembly of monomers to active dimers
- Glycosylation for dimer assembly and protein secretion

Scan to explore our extensive range



# HUMANKINE ADVANTAGES



**Animal-derived products are absent in the final product.**

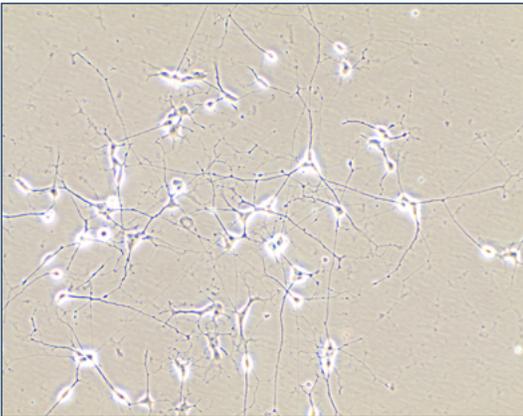


**No endotoxins present in the final product.**

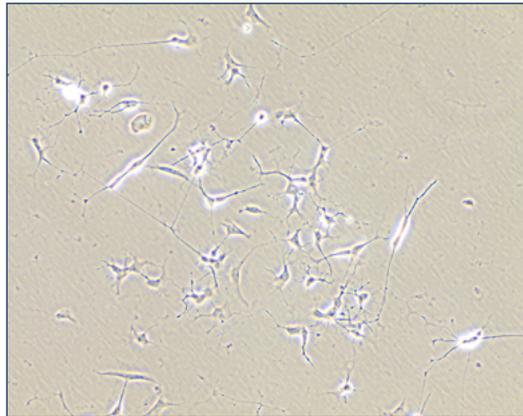


**All HumanKine® products are devoid of affinity tags.**

## Product Highlight HumanKine® Recombinant Human BDNF Protein (HZ-1335)



▲ Neuronal differentiation using HumanKine BDNF derived from HEK293.

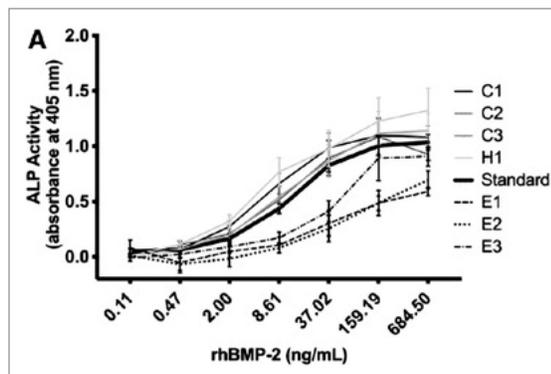


▲ Neuronal differentiation using Competitor BDNF derived from E.coli.

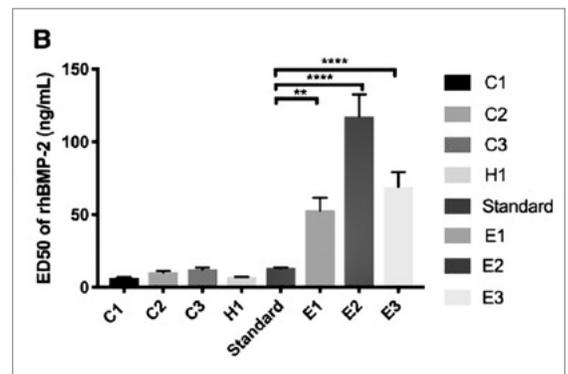
- Higher neuronal differentiation efficiency
- 6 times more bioactive than international standard
- Qualified as a raw material for stem cell therapy

## Product Highlight HumanKine® Recombinant Human BMP-2 Protein (HZ-1128)

Independent research demonstrates HEK293 derived HumanKine BMP-2 is more active and stable than either E.coli or CHO derived BMP-2.



▲ Bioactivity comparison of commercially available rhBMP-2 (A) RhBMP-2 dose-response curves obtained by incubating W-17-20 cells with rhBMP-2-containing medium for 24h.



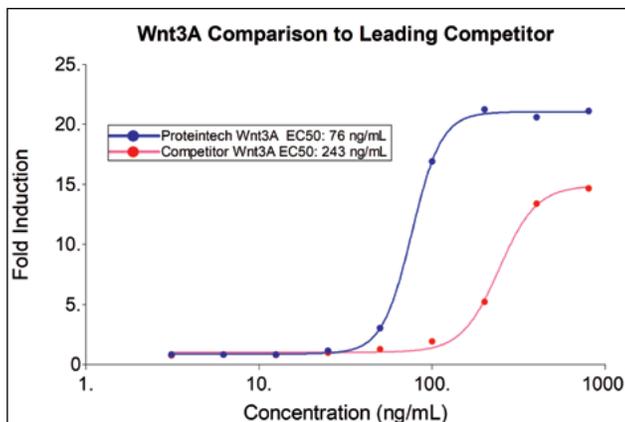
▲ Quantification of ED50 values based on (A). Data presented as average + SE (n=3). One-way analysis of variance was performed on ED50 data. \*\*p<0.01, \*\*\*p<0.0001.

Data from Fung et al., 2019.

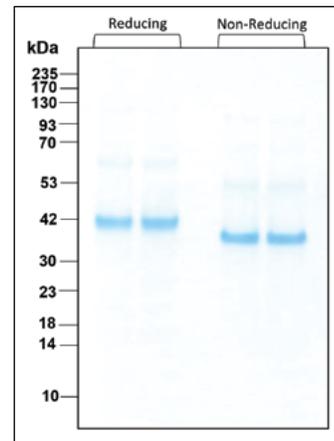
**Product Highlight** HumanKine® Recombinant Human Wnt3A Protein (HZ-1296)

Wnt3A recombinant protein is notoriously difficult to manufacture, with the purity of most Wnt3A recombinant proteins on the market being in the range of 75%. However, Proteintech's HumanKine recombinant cytokines and growth factors have several advantages.

- Purity close to 95%
- Higher bioactivity
- Better stability in cell culture media



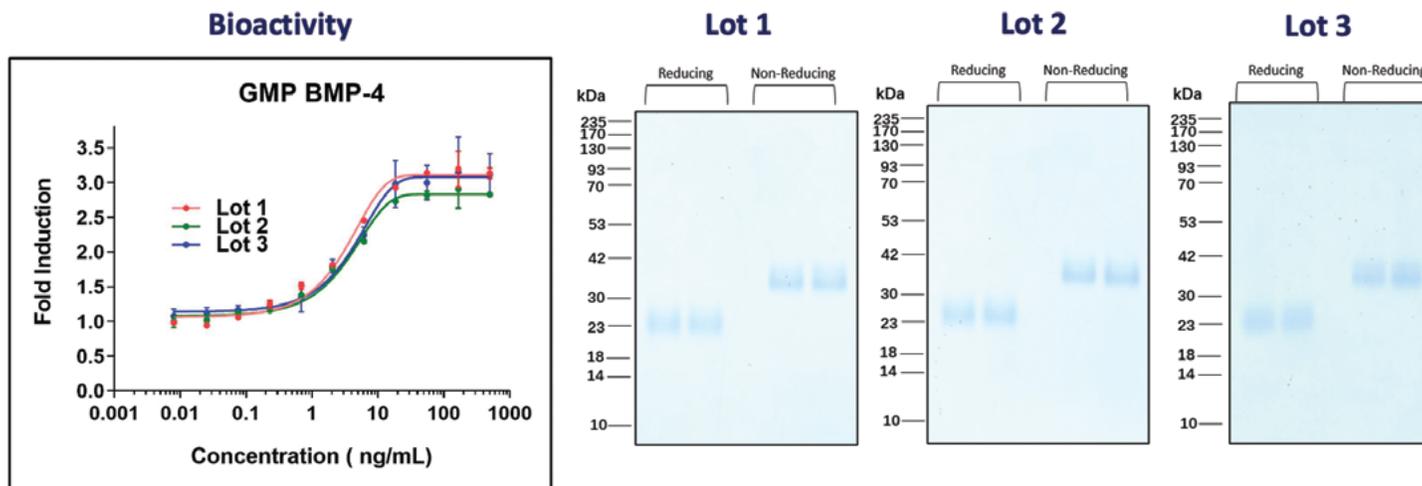
▲ Proteintech Wnt3A (HZ-1296) demonstrates a 3-fold lower EC50 and greater induction of luciferase production than a leading competitor.



▲ Purity of Recombinant Human Wnt3A was determined by SDS-polyacrylamide gel electrophoresis. The protein was resolved in an SDS-polyacrylamide gel in reducing and non-reducing conditions and stained using Coomassie blue.

**Lot-to-Lot Consistency**

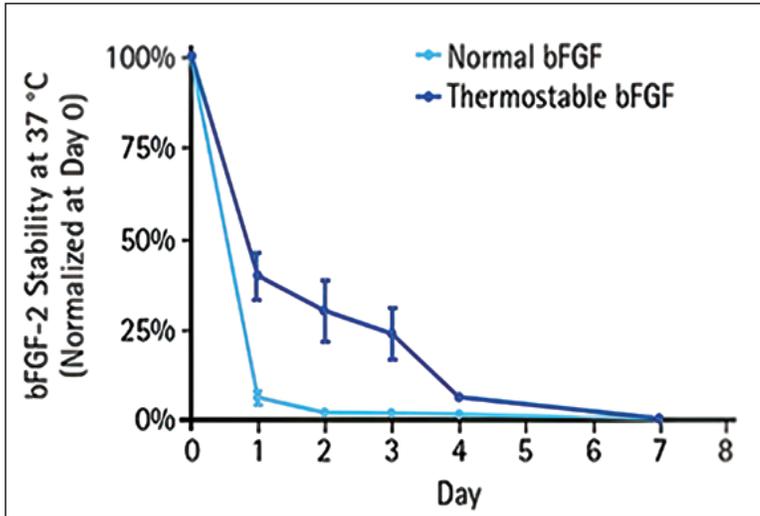
Well-defined media components and manufacturing processes ensure HumanKine® products have minimal variability in their bioactivity and purity. Better lot-to-lot consistency means higher reproducibility in your results!



▲ Three independent lots of GMP BMP-4 were tested for their ability to induce alkaline phosphatase production in ATDC5 (mouse chondrogenic) cells. The EC50 for this assay is 1.5-9 ng/mL. The activity of each lot is nearly identical. Each lot was also analyzed for purity on an SDS-polyacrylamide gel under reducing and non-reducing conditions.

# Growth Factors for STEM CELL AND ORGANOID CULTURE

Growth factors are important reagents that facilitate pluripotent stem cell maintenance and differentiation. HumanKine growth factors, with their authentic folding and post translational modifications, serve as a reliable reagent for stem cell maintenance and differentiations.



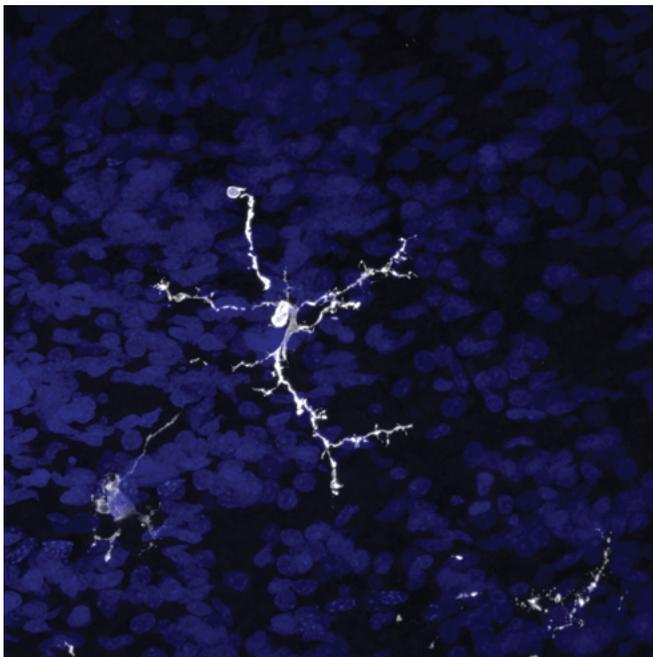
▲ Enhanced stability of TS bFGF-basic at 37°C vs normal bFGF Source: HumanKine® Thermostable bFGF, an engineered recombinant protein with enhanced biological functionality on human iPSCs. By: Nick Asbrock, Christine Chen, and Vi Chu\*, EMD Millipore, Bioscience Division, Temecula, CA, USA.

## Why choose HumanKine® for Stem Cell Research?

- Contains no human or animal-derived components
- Optimized for culturing clinical-grade human pluripotent stem cells
- Retains cell pluripotency and long-term potential for self-renewal and differentiation
- Provides high reproducibility and stable growth

## Growth factors for Organoid Development

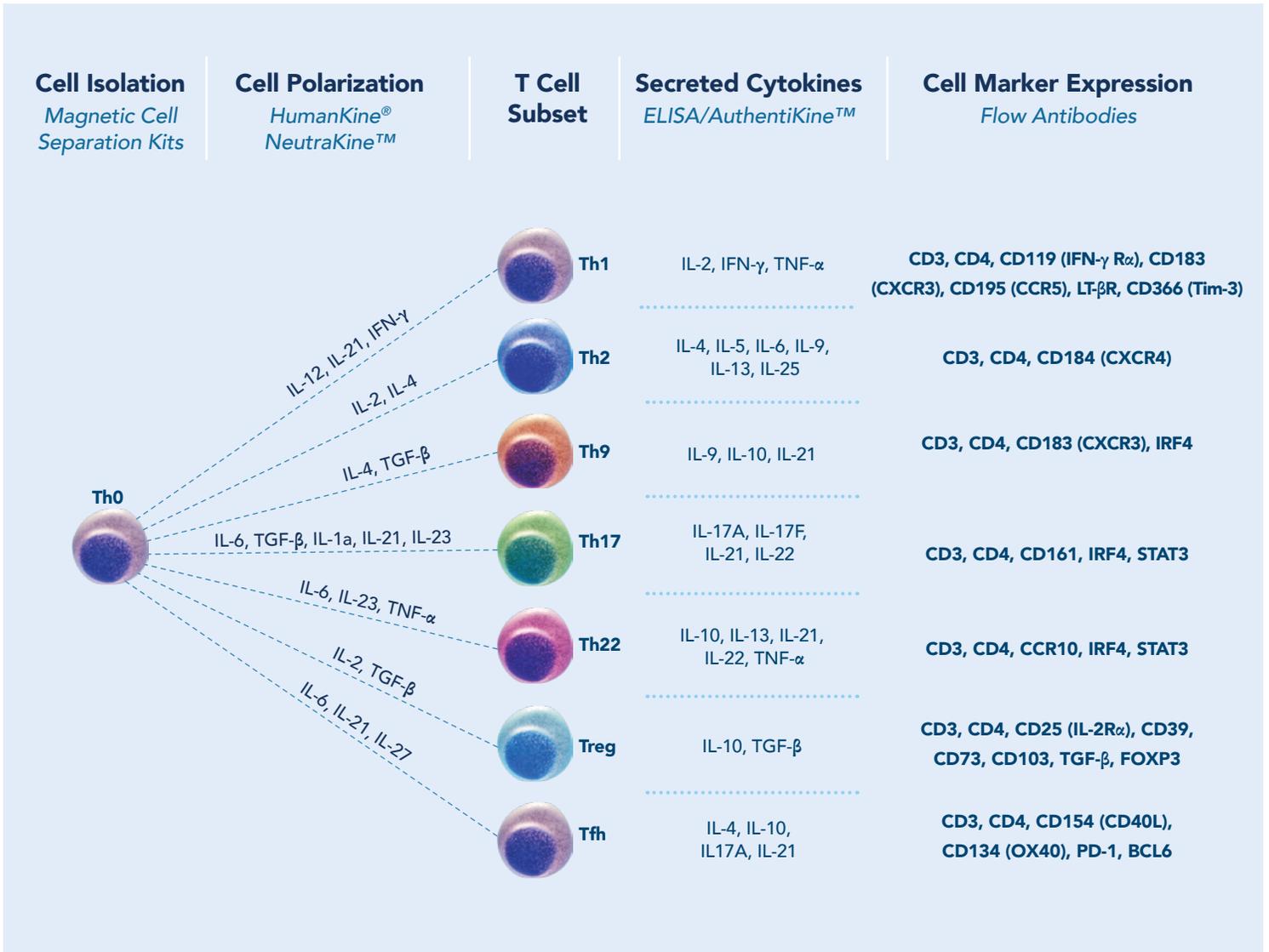
Organoid	Growth Factor	Catalog No.
Brain Organoids	BMP4	HZ-1045
	BDNF	HZ-1335
	EGF	HZ-1326
	bFGF	HZ-1285
	FGF8B	HZ-1103
	GDNF	HZ-1311
	SHH	HZ-1306
	Wnt3A	HZ-1296
	TGFB1	HZ-1011
	Intestinal Organoids	Activin A
EGF		HZ-1326
bFGF		HZ-1285
FGF4		HZ-1218
FGF9		HZ-1329
Noggin		HZ-1118
R spondin 1		HZ-1328
Wnt3A		HZ-1296
Pancreatic Organoids	EGF	HZ-1326
	Activin A	HZ-1138
	Noggin	HZ-1118
	R spondin 1	HZ-1328
	Wnt3A	HZ-1296
	KGF	HZ-1100



▲ Human iPSCs differentiated to microglia (white) using HumanKine® growth factors, residing within an in vivo brain-like organoid environment. By: Simon T. Schafer & Monique Pena, Technical University of Munich, Center for Organoid Systems.

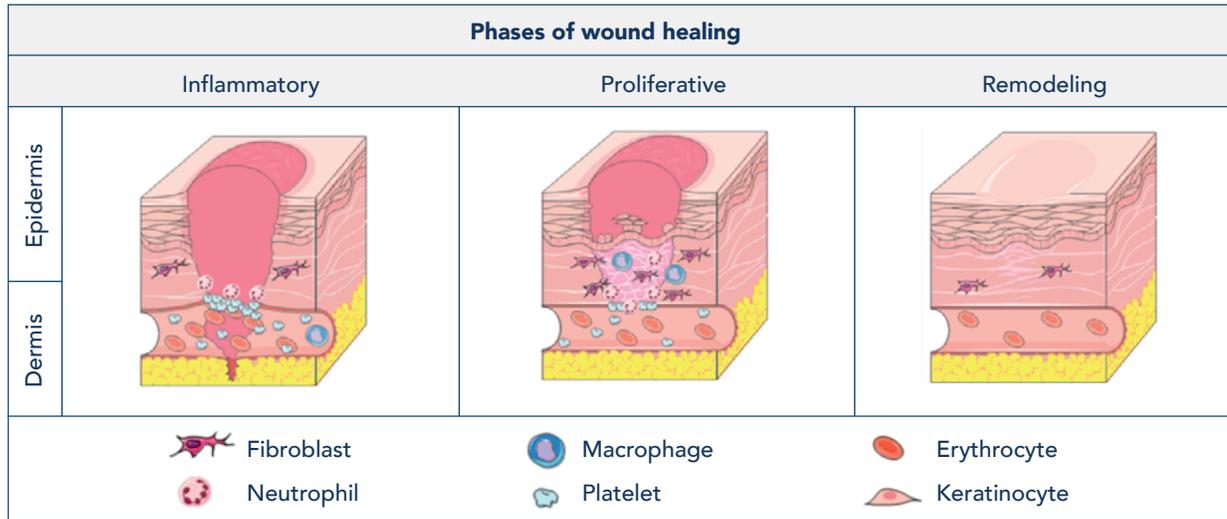
# Resources for T HELPER CELL POLARIZATION

T cell polarization is important in several immunological and biological processes. Each T cell subset can be polarized from a naïve Th0 precursor cell and has unique characteristics to provide specialized adaptive immunity against pathogens or self-antigens. Proteintech offers products for each step of this workflow, from cell isolation to polarized Th cell characterization.



# Cytokine toolkit for WOUND HEALING RESEARCH

Wound healing is a highly complex biological process of replacing damaged tissue with newly produced tissue. The wound healing process is regulated by many different cell types, growth factors, cytokines, and chemokines.



## Role of Cytokines and Growth Factors in the Wound Healing Process

CYTOKINE / GROWTH FACTOR	FUNCTION
<b>PDGF</b> — Platelet-Derived Growth Factor (including isoforms AA, AB, and BB) <i>Source: Platelets, macrophages, endothelial cells, keratinocytes, smooth muscle cells</i>	Chemotactic for PMNs (polymorphonuclear), macrophages, fibroblasts, and smooth muscle cells. Activates PMNs, macrophages, and fibroblasts. Mitogenic for fibroblasts, endothelial cells, and smooth muscle cells. Stimulates production of MMPs, fibronectin, and HA. Stimulates angiogenesis and wound contraction. Remodeling. Inhibits platelet aggregation. Regulates integrin expression.
<b>TGFβ</b> — Transforming Growth Factor Beta (including β1, β2, and β3) <i>Source: Platelets, T-lymphocytes, macrophages, endothelial cells, keratinocytes, smooth muscle cells, fibroblasts</i>	Chemotactic for PMNs, macrophages, lymphocytes, fibroblasts, and smooth muscle cells. Stimulates TIMP synthesis, keratinocyte migration, angiogenesis, and fibroplasia. Inhibits MMP production and keratinocyte proliferation. Regulates integrin expression and other cytokines. Induces TGFβ production.
<b>EGF</b> — Epidermal Growth Factor <i>Source: Macrophages, T-lymphocytes, keratinocytes, and many tissues</i>	Mitogenic for keratinocytes and fibroblasts. Stimulates keratinocyte migration and granulation tissue formation.
<b>TGFα</b> — Transforming Growth Factor Alpha <i>Source: Macrophages, T-lymphocytes, keratinocytes, and many tissues</i>	Mitogenic for keratinocytes and fibroblasts. Stimulates keratinocyte migration and granulation tissue formation.
<b>FGF</b> — Fibroblast Growth Factor family <i>Source: Macrophages, mast cells, T-lymphocytes, endothelial cells, fibroblasts, and many tissues</i>	Chemotactic for fibroblasts. Mitogenic for fibroblasts and keratinocytes. Stimulates keratinocyte migration, angiogenesis, wound contraction, and matrix deposition.
<b>KGF</b> — Keratinocyte Growth Factor (also called FGF-7) <i>Source: Macrophages, mast cells, T-lymphocytes, endothelial cells, fibroblasts, and many tissues</i>	Stimulates keratinocyte migration, proliferation, and differentiation.

CYTOKINE / GROWTH FACTOR	FUNCTION
<b>IGF-1</b> — Insulin-like Growth Factor-1 <i>Source: Liver, macrophages, fibroblasts, and other tissues</i>	Stimulates keratinocyte migration, proliferation, and differentiation.
<b>VEGF</b> — Vascular Endothelial Cell Growth Factor <i>Source: Keratinocytes</i>	Increases vaso-permeability. Mitogenic for endothelial cells.
<b>TNF</b> — Tumor Necrosis Factor <i>Source: Macrophages, mast cells, T-lymphocytes</i>	Activates macrophages. Mitogenic for fibroblasts. Stimulates angiogenesis. Regulates other cytokines.
<b>IL-1</b> — Interleukin-1 <i>Source: Macrophages, keratinocytes</i>	Stimulates MMP-1 synthesis, fibroblast, and keratinocytes chemotaxis.
<b>IL-6</b> — Interleukin-6 <i>Source: Macrophages, keratinocytes, PMNs</i>	Fibroblast proliferation, TIMP synthesis.
<b>IL-8</b> — Interleukin-8 <i>Source: Macrophages, fibroblasts</i>	PMN chemotaxis, collagen synthesis.
<b>IFN-γ etc.</b> — Interferons <i>Source: Lymphocytes and fibroblasts</i>	Activates macrophages. Inhibits fibroblast proliferation and MMP synthesis. Regulates other cytokines.

## HumanKine® Cytokines and Growth Factors for Wound Healing Research

Catalog No.	Product Name	Species	Activity
HZ-1215	HumanKine® Recombinant Human PDGFaa	Human	≤ 10 ng/mL EC50
HZ-1308	HumanKine® Recombinant Human PDGFbb	Human	0.3-3 ng/mL EC50
HZ-1011	HumanKine® Recombinant Human TGF beta 1	Human	≤ 0.5 ng/mL EC50
HZ-1092	HumanKine® Recombinant Human TGF beta 2	Human	0.018-0.18 ng/mL EC50
HZ-1090	HumanKine® Recombinant Human TGF beta 3	Human	<0.75 ng/mL EC50
HZ-1327	HumanKine® Recombinant Human FGF-1	Human	0.5-2.5 ng/mL EC50
HZ-1285	HumanKine® Recombinant Human FGFbasic-TS	Human	0.4-2.5 ng/mL EC50
HZ-1218	HumanKine® Recombinant Human FGF-4	Human	6-30 ng/mL EC50
HZ-1100	HumanKine® Recombinant Human FGF-7 (KGF)	Human	4-20 ng/mL EC50
HZ-1322	HumanKine® Recombinant Human IGF-1	Human	2-14 ng/mL EC50
HZ-1038	HumanKine® Recombinant Human VEGF165	Human	0.3-3.75 ng/mL EC50
HZ-1204	HumanKine® Recombinant Human VEGF121	Human	≤ 15 ng/mL EC50
HZ-1014	HumanKine® Recombinant Human TNF alpha	Human	0.002-0.026 ng/mL EC50
HZ-1320	HumanKine® Recombinant Human IL-1 alpha	Human	0.125-1.25 ng/mL EC50
HZ-1164	HumanKine® Recombinant Human IL-1 beta	Human	≤ 0.05 ng/mL EC50
HZ-1019	HumanKine® Recombinant Human IL-6	Human	0.03-0.24 ng/mL EC50
HZ-1318	HumanKine® Recombinant Human IL-8	Human	100-500 ng/mL EC50
HZ-1301	HumanKine® Recombinant Human IFN gamma	Human	0.02-0.14 ng/mL EC50



# humankine<sup>®</sup> GMP-GRADE CYTOKINES AND GROWTH FACTORS

*Largest portfolio of GMP-grade recombinant proteins in the market*

Growth factors and cytokines are key raw materials/ancillary materials required for the manufacturing of cell-based therapies. As the demand for autologous and allogeneic cell therapy is rapidly growing, the need for high-quality raw material is becoming increasingly important. Keeping quality as our motto, Proteintech GMP-grade HumanKine growth factors and cytokines are manufactured in accordance with USP, WHO, and ISO standards, which ensuring patient safety.

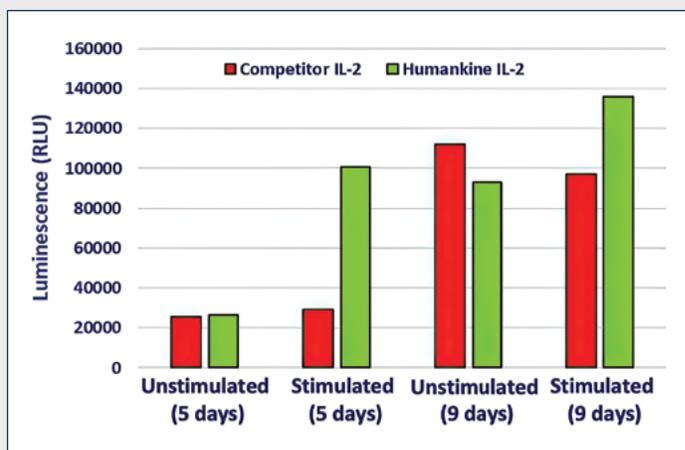
*Our mission is to expedite the efficient progression of cell, gene, and tissue-engineered products from preclinical to clinical stage, for the benefit of patients worldwide.*

- ISO13485 certified
- Continuously restocked inventory and prompt shipment
- Quality check at every step of production
- High lot-to-lot consistency
- ISO-rated cleanrooms for manufacturing and filling
- Raw material qualification and traceability
- Expert support

## HumanKine<sup>®</sup> IL-2 treatment results in greater levels of T-cell expansion and proliferation. (HZ-1015)

► Cultures were treated with either competitor IL-2 (red) or HumanKine<sup>®</sup> IL-2 (green), and then left unstimulated (control) or stimulated with 1  $\mu$ M zoledronic acid. Increased cell proliferation was seen in the stimulated cultures treated with Humankine<sup>®</sup> product.

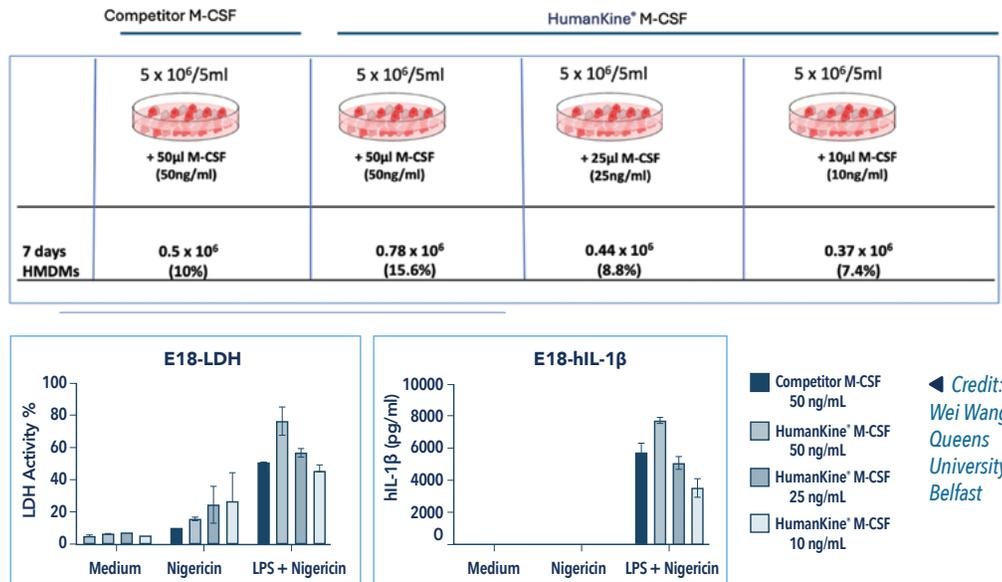
Source: Dr. Leonardo Castrillo and Dr. Alessandro Poggi, IRCCS Ospedale Policlinico San Martino, unit of Molecular Oncology and Angiogenesis, Genoa, Italy.



**Product Highlight** HumanKine®

**Recombinant Human MCSF Protein (HZ-1192)**

Macrophages are becoming more and more popular in the cell therapy space due to their ability to infiltrate solid tumors. Compared to the leading supplier, HumanKine® MCSF was able to generate 50% more monocyte derived macrophages.

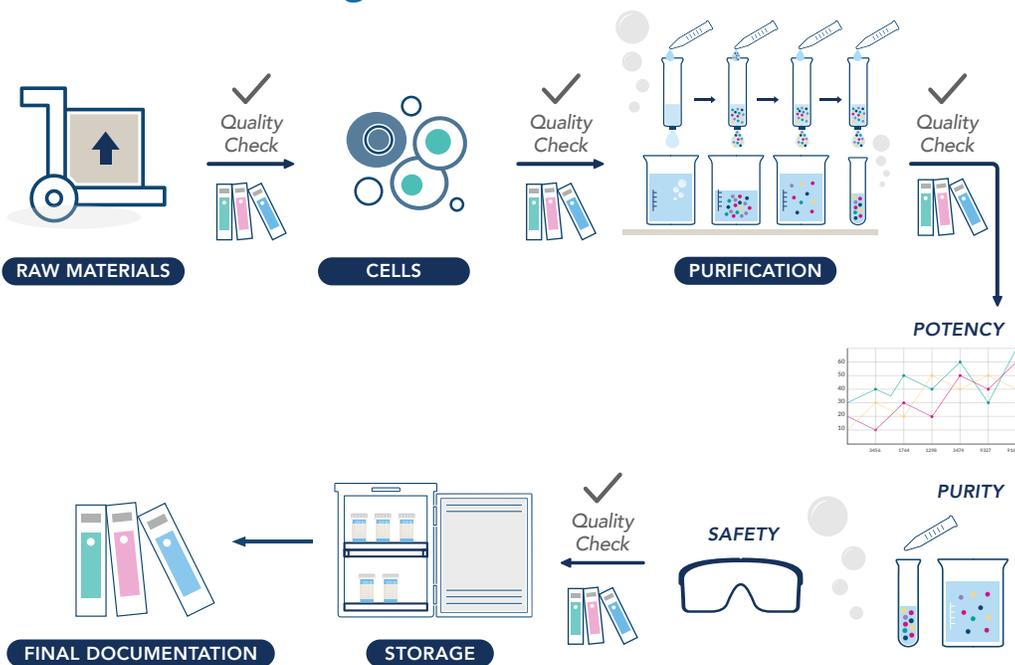


◀ Credit: Wei Wang, Queens University, Belfast

**HumanKine® GMP Quality**

- USP Chapter <1043>, Ancillary Materials for Cell, Gene, and Tissue-Engineered Products.
- USP Chapter <92>, Growth Factors and Cytokines used in Cell Therapy Manufacturing.
- Ph. Eur. General Chapter 5.2.12, Raw Materials of Biological Origin for the Production of Cell-based and Gene Therapy.
- WHO TRS, No. 822, 1992 Annex 1 Good Manufacturing Practices for Biological Products.
- USP <71> sterility testing.
- USP<63> Mycoplasma testing.
- USP<85> Bacterial endotoxin testing.

**cGMP Manufacturing Process**



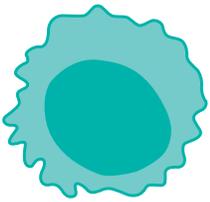
**RUO to GMP, the same protein**

The master cell line and manufacturing process are the same for GMP-grade and research-use-only cytokines and growth factors, which minimizes risk and comparability testing and facilitates a seamless translation.

## Complete portfolio of GMP-grade growth factors to EXPAND CLINICALLY RELEVANT CELL TYPES

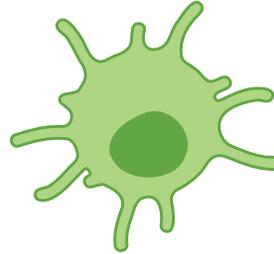
Our comprehensive portfolio of HumanKine® GMP-grade growth factors serves as a catalyst for expanding clinically relevant cell types, offering a robust foundation for diverse cellular therapies. These meticulously produced growth factors adhere to Good Manufacturing Practices (GMP), ensuring the highest quality and safety standards for therapeutic applications.

### Immune Cells



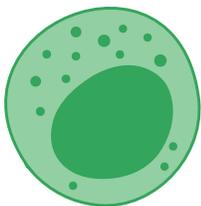
**T Cell**

*IL-2, IL-7,  
IL-15, IL-21*



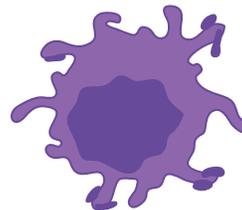
**Dendritic Cell**

*GM-CSF, IL-4, IL-1 $\beta$ ,  
IL-6, TNF- $\alpha$ , IFN- $\gamma$*



**Natural Killer Cell**

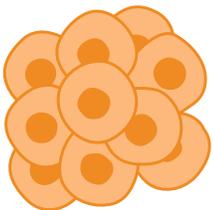
*IL-7, IL-15, IL-21, FLT3L  
EPO, TPO, SCF, IL3, IL-6*



**Macrophage**

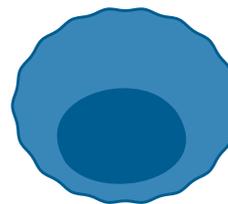
*GM-CSF, TNF- $\alpha$ , M-CSF,  
IFN- $\gamma$ , IL-4, IL-10, IL-6*

### Stem Cells



**Pluripotent Stem Cell**

*b-FGF, TGF- $\beta$  1,  
Activin A, BMP-2,  
Noggin*



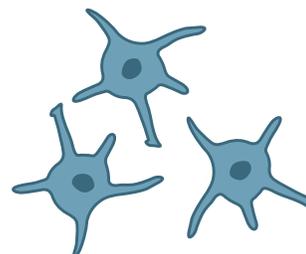
**Hematopoietic Stem Cell**

*IL-3, IL-6, TPO,  
FLT3L, SCF*



**Mesenchymal Stem Cells**

*b-FGF, TGF- $\beta$  1,  
EGF, PDGFbb*



**Neural Stem Cells**

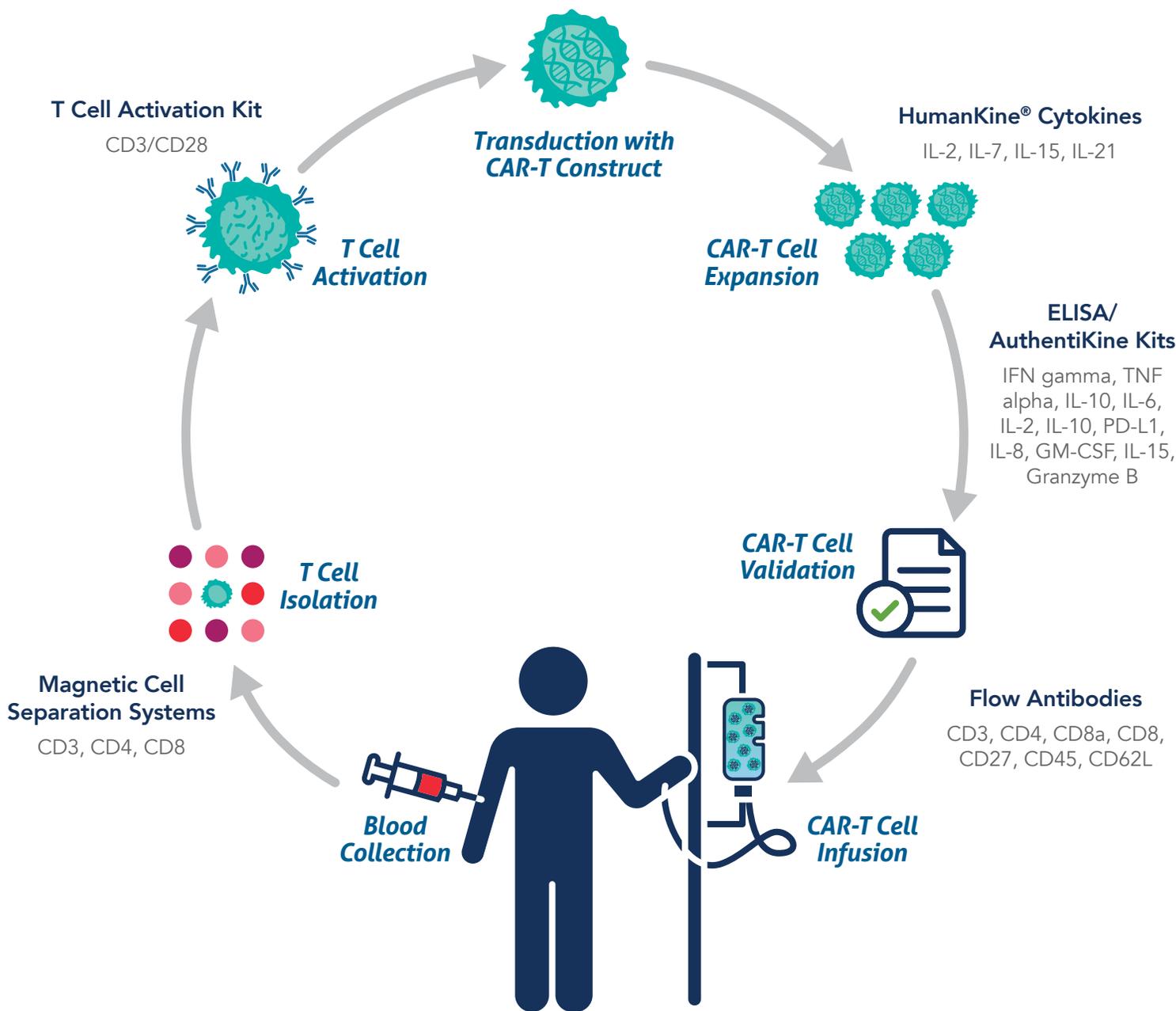
*EGF, b-FGF,  
TGF- $\beta$  1, BDNF,  
GDNF, FGF8B*



For an extensive list of products, scan here

# CAR-T Workflow

Proteintech offers a complete workflow solution for customers working with Chimeric Antigen Receptor-T (CAR-T) cells. Because of the therapeutic nature of this research, the highest-quality reagents are required to investigate and develop new immunotherapies. Proteintech's thoroughly validated products are all manufactured in-house.



## HumanKine® Recombinant GMP-grade Human Proteins

Protein Name	Catalog No.	Activity (EC 50)	Purity	Protein Name	Catalog No.	Activity (EC 50)	Purity
Activin A	HZ-1138-GMP	0.5-3.5 ng/mL	> 95%	IL-9	HZ-1240-GMP	0.01-0.06 ng/mL	>95%
beta NGF	HZ-1222-GMP	0.5-3.0 ng/mL	> 95%	IL-10	HZ-1145-GMP	0.18-2.0 ng/mL	>95%
BMP-2	HZ-1128-GMP	7.5-37.5 ng/mL	> 95%	IL-12	HZ-1256-GMP	0.8-4 ng/mL	>95%
BMP-4	HZ-1045-GMP	1.5-9 ng/mL	> 95%	IL-15	HZ-1337-GMP	0.01-0.15 ng/mL	>95%
BMP-7	HZ-1229-GMP	50-275 ng/mL	> 95%	IL-21	HZ-1319-GMP	0.25-1.25 ng/mL	>95%
Cystatin C	HZ-1211-GMP	0.5-2.6 µg/mL	> 95%	IL-21	HZ-1254-GMP	1.25-6.5 ng/mL	>95%
EGF	HZ-1326-GMP	0.1-0.6 ng/mL	> 95%	IL-23	HZ-1254-GMP	1.25-6.5 ng/mL	>95%
EPO	HZ-1168-GMP	0.2-3.0 ng/mL	> 95%	IL-28A	HZ-1235-GMP	0.01-0.06 ng/mL	>95%
FGF-4	HZ-1218-GMP	6-30 ng/mL	> 95%	IL-34	HZ-1316-GMP	0.45-4.5 ng/mL	>95%
FGF-7 (KGF)	HZ-1100-GMP	4-20 ng/mL	> 95%	LIF	HZ-1292-GMP	0.045-0.25 ng/mL	>95%
FGF-8b	HZ-1103-GMP	10-60 ng/mL EC50	> 95%	M-CSF	HZ-1192-GMP	0.7-4.0 ng/mL	>95%
FGFbasic-TS	HZ-1285-GMP	0.4-2.5 ng/mL	> 95%	Noggin	HZ-1118-GMP	1.5-15 ng/mL	>95%
FLT3 Ligand	HZ-1151-GMP	0.4-3.0 ng/mL	> 95%	OSM	HZ-1030-GMP	0.1-1.5 ng/mL	>95%
G-CSF	HZ-1207-GMP	0.009-0.05 ng/mL	> 95%	PDGFbb	HZ-1308-GMP	0.3-3 ng/mL	>95%
GDNF	HZ-1311-GMP	3-18 ng/mL	> 95%	Pleiotrophin (PTN)	HZ-1278-GMP	100-500 ng/mL	>95%
GM-CSF	HZ-1002-GMP	0.08-0.8 ng/mL	> 95%	SCF	HZ-1024-GMP	15-85 ng/mL	>95%
HGF	HZ-1084-GMP	5-25 ng/mL	> 95%	TGF beta 1	HZ-1011-GMP	0.01-0.17 ng/mL	>95%
HGH	HZ-1007-GMP	0.05-0.5 ng/mL	> 95%	TGF beta 2	HZ-1092-GMP	0.018-0.18 ng/mL	>95%
HSA	HZ-3001-GMP	N/A	> 95%	TGF beta 3	HZ-1090-GMP	0.01 - 0.2 ng/mL	>95%
IFN alpha 2B	HZ-1072-GMP	0.004-0.02 ng/mL	> 95%	Thrombin	HZ-3010-GMP	1000-5000 units/ mg	>95%
IFN beta	HZ-1298-GMP	0.015-0.08 ng/mL	> 95%	TNF alpha	HZ-1014-GMP	0.002-0.026 ng/ mL	>95%
IFN gamma	HZ-1301-GMP	0.02-0.14 ng/mL	> 95%	TPO (Thrombopoietin)	HZ-1248-GMP	100-500 ng/mL	>95%
IGF-I	HZ-1322-GMP	2-14 ng/mL	> 95%	Transferrin	HZ-1317-GMP	65-330 ng/mL	>95%
IL-1 alpha	HZ-1320-GMP	0.125-1.25 ng/mL	> 95%	VEGF C	HZ-1336-GMP	2-16 ng/mL	>95%
IL-1 beta	HZ-1164-GMP	≤ 0.05 ng/mL	> 95%	VEGF121	HZ-1204-GMP	1.5-9 ng/mL	>95%
IL-2	HZ-1015-GMP	0.05-0.35 ng/mL	> 95%	VEGF165	HZ-1038-GMP	0.3-3.75 ng/mL	>95%
IL-3	HZ-1074-GMP	0.4-2.0 ng/mL	> 95%	Wnt3A	HZ-1296-GMP	0.045-0.25 ng/mL	>95%
IL-4	HZ-1004-GMP	0.07-0.4 ng/mL	> 95%				
IL-6	HZ-1019-GMP	0.03-0.24 ng/mL	> 95%				
IL-7	HZ-1281-GMP	0.1-1.4 ng/mL	> 95%				



## Frequently Asked QUESTIONS



### How are HumanKine® GMP cytokines different from the RUO cytokines?

GMP proteins come with extensive documentation for traceability, as well as additional quality control testing and quality assurance reviews, whereas the RUO grade line offers reliable products that are more cost-effective during early research and development. As the manufacturing process is the same for RUO and GMP products, HumanKine offers a seamless preclinical-to-clinical transition line of products, saving a significant amount of time and money.

### Are HumanKine GMP cytokines suitable for direct human administration?

No, HumanKine GMP products are not intended for use as an excipient or therapeutic product that can be directly administered to the human body. These products are developed to be used as raw materials for the manufacturing of cell and gene therapy products, but not as part of the final formulation or therapy.

### Is HumanKine GMP product manufacturing certified by the FDA or other regulatory agencies?

US-FDA does not audit or certify manufacturing facilities that produce ancillary materials. HumanKine GMP products are manufactured under the ISO13485

quality management system adhering to USP and European pharmacopeia recommendations to ensure potency, purity, and safety. The manufacturing facility can be audited by the end users upon request.

### What is the risk classification for HumanKine GMP Cytokines?

HumanKine GMP Cytokines are classified as Tier 2 risk products under USP Chapter <1043>. The products are low-risk, well-characterized materials, produced in compliance with GMP guidelines, and intended to be used as ancillary materials/raw materials.

### Are HumanKine GMP cytokines animal component free?

Yes! HumanKine GMP manufacturing processes and the final product do not use or contain any animal or human-derived components.

### How are HumanKine GMP cytokines shipped?

HumanKine GMP products are shipped as lyophilized, in glass vials at ambient temperature. The stability of these products is extensively tested to ensure the above-specified shipping conditions do not affect product quality or performance.

# MAGNETIC CELL SEPARATION SYSTEMS

## *Isolate and activate*

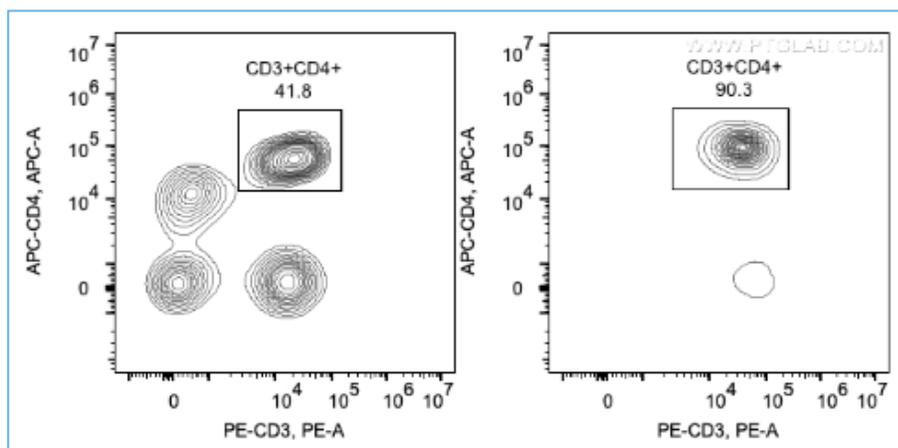
The characterization of specific cell types and their use in various downstream applications requires that cells of interest can be isolated from a heterogeneous cell population such as PBMC or whole blood.

Simply incubate your heterogeneous cell suspension with Proteintech's highly specific magnetic cell separation beads to discover quick, easy, column-free cell depletions and isolations, resulting in a high-purity homogeneous cell population of interest.

- Quick and easy compared to cell separation by fluorescence activated cell sorting (FACS)
- High-quality, in-house validation including PBMC and whole blood testing
- Compatible with your current magnet!



Scan to explore the range



▲ Following cell separation (enrichment), cell suspension was stained with FITC-CD45(F10-89-4), PE-CD3(UCHT1), and APC-CD4(OKT4) antibodies. All CD45+ cells are gated in the analysis. Left panel: CD3+CD4+ cells before selection. Right panel: CD3+CD4+ cells after selection. Human CD4 selection kit is tested using PBMC from three donors.

## Magnetic Beads Products

Product	Product Type	Size
Streptavidin	Magnetic Beads	0.1mL or 1mL
Human CD3	Magnetic Beads or Kit	10 or 100 tests
Human CD4	Magnetic Beads or Kit	10 or 100 tests
Human CD8	Magnetic Beads or Kit	10 or 100 tests
Human CD19	Magnetic Beads or Kit	10 or 100 tests

## Cell Isolation Products

Product	Catalog No.	Size
Mouse Lineage Depletion Kit	KMS301	10 or 100 tests
Human CD4 Isolation Kit	KMS302	10 or 100 tests
Human CD8 Isolation Kit	KMS303	10 or 100 tests
Human CD3 Isolation Kit	KMS309	10 or 100 tests
Human CD4 Memory T Cell Isolation Kit	KMS305	10 or 100 tests
Human CD8 Memory T Cell Isolation Kit	KMS307	10 or 100 tests
Human NK Cell Isolation Kit	KMS308	10 or 100 tests

# ANTIBODIES FOR FLOW CYTOMETRY

## Multiplex with ease

### Flow Cytometry Antibodies and Panels

Top-cited clones have been conjugated to a wide range of dyes for ease of staining and to reduce the length of your protocol. Unconjugated antibodies are also available to give you the most flexibility in building your panel.

- 160+ top-cited clones for human, mouse, and rat targets
- Conjugated to CoraLite® Plus and classic flow cytometry dyes
- Rigorous and transparent validation data
- Pre-optimized panels available for Human T, B, NK, and Monocyte cell types
- Bulk pure antibody available

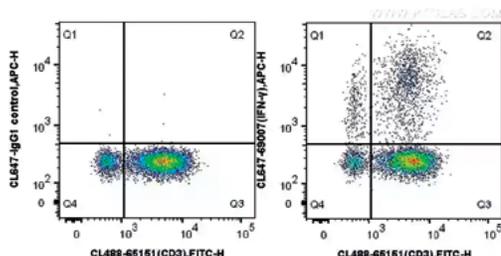
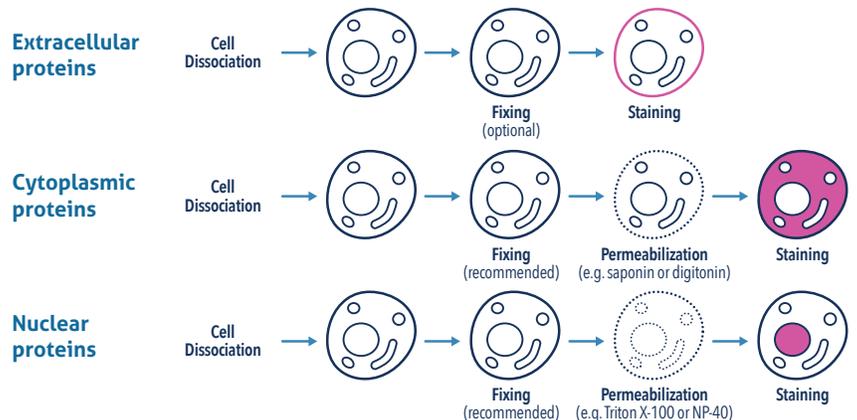
Dyes	Excitation, nm	Emission, nm	Spectrally similar dyes
Atlantic Blue™	404	458	Pacific Blue™
FITC/FITC Plus	490	525	Alexa Fluor® 488
PE	490; 565	578	Alexa Fluor® 555, Cy3, DyLight® 550
Cardinal Red™	592	611	Alexa Fluor® 594, Texas Red®
APC	650	661	Alexa Fluor® 647, Cy5, DyLight® 650

Dyes	Excitation, nm	Emission, nm	Spectrally similar dyes
CoraLite® Plus 405	399	422	Alexa Fluor® 405
CoraLite® Plus 488	493	522	Alexa Fluor® 488, FITC
CoraLite® Plus 555	554	570	Alexa Fluor® 555, Cy3, DyLight® 550
CoraLite® 594	590	617	Alexa Fluor® 594, Texas Red®
CoraLite® Plus 647	654	674	Alexa Fluor® 647, Cy5, DyLight® 650
CoraLite® Plus 750	755	780	Alexa Fluor® 750, DyLight® 755

### Intracellular Flow Cytometry

A wide selection of Proteintech primary antibodies have been validated for intracellular flow cytometry and conjugated to CoraLite® Plus dyes for easy multiplexing.

- Use flow cytometry to study cell signaling, cell death, neuroscience, epigenetics, and more
- Over 1600 antibodies to more than 800 targets
- Many conjugated antibodies also validated for IF – use the same antibody for both!

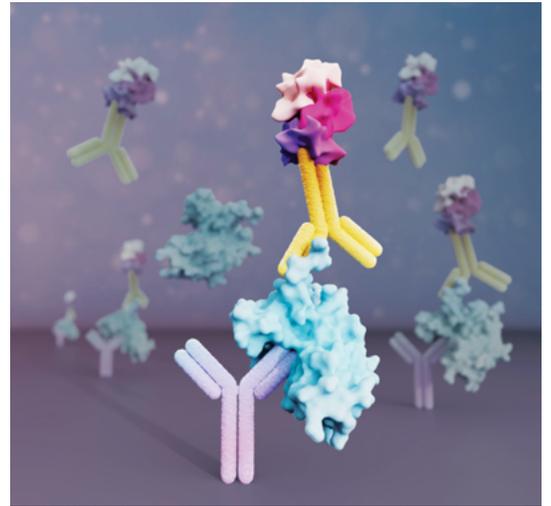


◀ 1X10<sup>6</sup> human PBMCs were treated with PMA, ionomycin, and protein transport inhibitors for 6h, then intracellularly stained with 0.25 ug CoraLite® Plus 647 Anti-Human IFN Gamma (CL647-69007), and 0.25 ug CoraLite® 488 Anti-Human CD3 (UCHT1) (CL488-65151). Cells were fixed with 4% PFA and permeabilized with Flow Cytometry Perm Buffer (PF00011-C).

## ELISA KITS

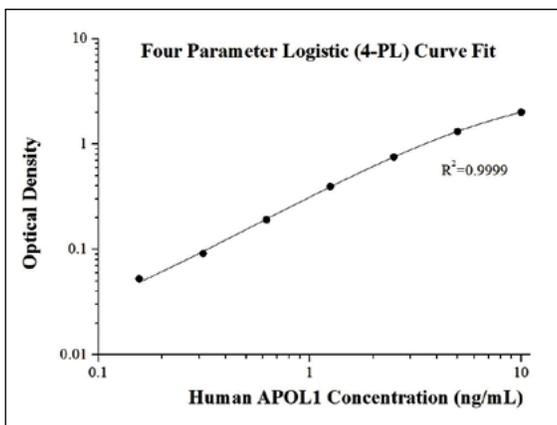
*Pre-coated ELISA kits with superior performance and reliability*

- Over 350 targets, all made in-house
- Extensive statistical validation with natural samples
- Easy-to-follow protocols, strip-plate format
- Competitively priced to fit your budget
- Target coverage for the following areas:
  - Cancer
  - Cardiovascular
  - Kidney disease
  - Immunology
  - Metabolism
  - Neuroscience



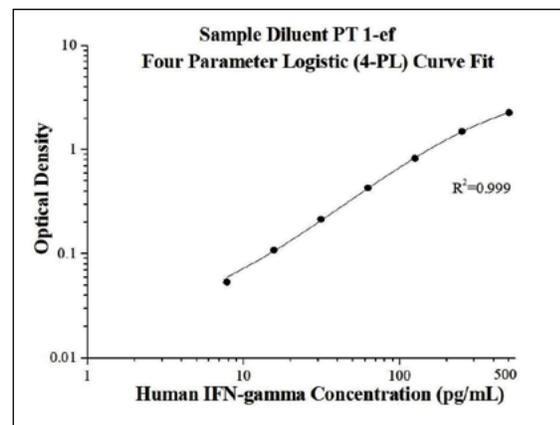
### Human APOL1 ELISA kit (KE00047)

First-to-market for this important target in kidney disease.



### AuthentiKine™ Human IFN-gamma ELISA kit (KE00146)

15x more sensitive than leading competitors.



## AUTHENTIKINE™ ELISA KITS

*Highly sensitive ELISA kits made with real human proteins*

- ELISA kits for measuring growth factors and cytokines
- Made with HumanKine® proteins as immunogens and kit protein standards
- Enables more sensitive detection of native human proteins with authentic glycosylation
- Up to 1000x more sensitive than leading competitors



HumanKine® Cytokines and Growth Factors





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