

# humanKine® 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 ensures maximum patient safety.

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

- ✓ Animal component free
- ✓ Endotoxin free
- ✓ Xeno free
- ✓ Tag free
- ✓ Carrier free

## Reasons to choose HumanKine® GMP proteins:

- 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

## 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.



Scan the QR Code for more information on Humakine products

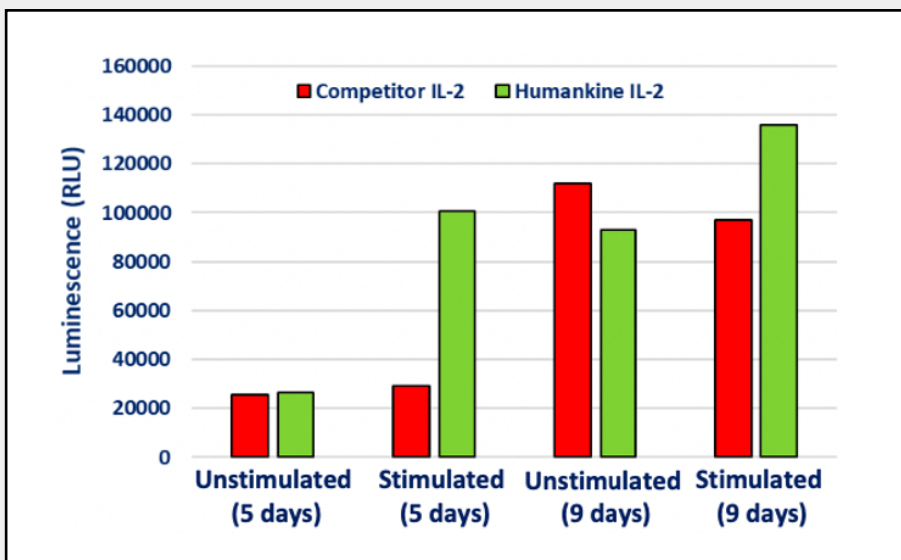


## HumanKine® GMP Quality

Proteintech is ISO 13485:2016 certified and our GMP HumanKine products are manufactured and tested in accordance with the relevant sections of the following standards:

- 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.

## Humankine® IL-2 treatment results in greater levels of T-cell expansion and proliferation.



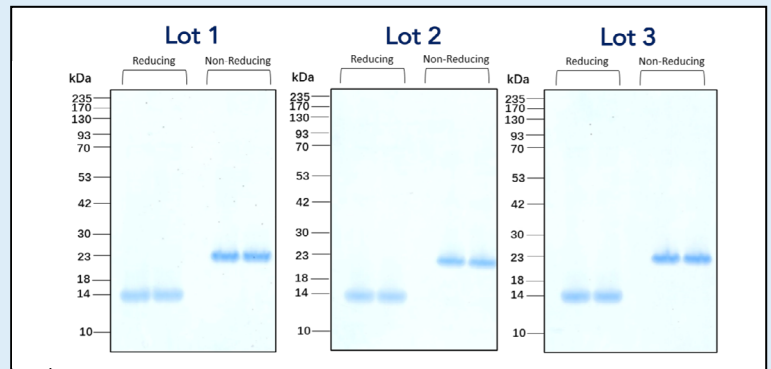
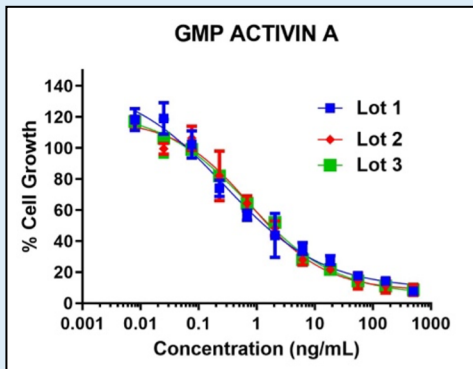
◀ Cultures were treated with either competitor IL-2 (red) or Humankine® IL-2 (green), and then left unstimulated (control) or stimulated with 1  $\mu$ M zoledronic acid. Increased cell proliferation was seen in the stimulated cultures treated with Humankine® product.

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





# High Lot-to-Lot Consistency with **human**kin<sup>®</sup> GMP-grade Cytokines and Growth Factors



▲ **GMP Activin A (HZ-1138-GMP)** | Three independent lots of GMP grade Activin A were tested for their ability to inhibit the proliferation of MPC-11 (mouse plasmacytoma) cells. The EC50 for this assay is 0.5-3.5 ng/mL. The activity of each lot is nearly identical to each other. Each lot was also analyzed for purity on an SDS-polyacrylamide gel under reducing and non-reducing conditions.

## Guaranteed Quality at Every Step of Production

Quality Attributes	GMP Grade	Quality Attributes	GMP Grade
Documented Processes (QMS)	✓	Systematic and Organized Training Program for Qualified Personnel	✓
Raw Material and Vendor Qualification	✓	Drug master files (DMF)	In progress
Routine Monitoring and Qualification of Cleanrooms, Instruments, and Equipment	✓	Deviations and Corrective Action Preventative Actions (CAPA)	✓
Validated Manufacturing Processes and Assays	✓	Final Product QC Release	✓
Well Defined Standards and In-Process Quality Checks (IPQC)	✓		



## HumanKine® Recombinant GMP-grade Human Proteins

Protein Name	Thomas No.	Mfr. No.	Activity (EC 50)	Purity
Activin A	CHM03X020	HZ-1138-GMP	0.5-3.5 ng/mL	> 95%
BMP-2	CHM03X017	HZ-1128-GMP	7.5-37.5 ng/mL	> 95%
BMP-4	CHM03W992	HZ-1045-GMP	1.5-9 ng/mL	> 95%
Cystatin C	CHM03X035	HZ-1211-GMP	0.5-2.6 µg/mL	> 95%
FGF-7 (KGF)	CHM03X008	HZ-1100-GMP	4-20 ng/mL	> 95%
FGFbasic-TS	CHM03X059	HZ-1285-GMP	0.07-0.4 ng/mL	> 95%
FLT3 Ligand	CHM03X026	HZ-1151-GMP	0.4-3.0 ng/mL	> 95%
G-CSF	CHM03X032	HZ-1207-GMP	0.009-0.05 ng/mL	> 95%
GM-CSF	CHM03W963	HZ-1002-GMP	0.08-0.8 ng/mL	> 95%
HGF	CHM03X001	HZ-1084-GMP	5-25 ng/mL	> 95%
HGH	CHM03W969	HZ-1007-GMP	0.02-0.120 ng/mL	> 95%
HSA	CHM03X088	HZ-3001-GMP	N/A	> 95%
IFN Alpha 2B	CHM03W995	HZ-1072-GMP	0.004-0.02 ng/mL	> 95%
IFN Beta	CHM03X067	HZ-1298-GMP	0.015-0.08 ng/mL	> 95%
IFN Gamma	CHM03X070	HZ-1301-GMP	0.02-0.14 ng/mL	> 95%
IGF-I	CHM03X080	HZ-1322-GMP	2-14 ng/mL	> 95%
IL-2	CHM03W977	HZ-1015-GMP	0.05-0.35 ng/mL	> 95%
IL-3	CHM03W998	HZ-1074-GMP	0.4-2.0 ng/mL	> 95%
IL-4	CHM03W966	HZ-1004-GMP	0.07-0.4 ng/mL	> 95%
IL-6	CHM03W980	HZ-1019-GMP	0.03-0.24 ng/mL	> 95%
IL-7	CHM03X056	HZ-1281-GMP	0.2-1.4 ng/mL	> 95%
IL-9	CHM03X047	HZ-1240-GMP	0.1-0.6 ng/mL	> 95%
IL-10	CHM03X023	HZ-1145-GMP	0.18-2.0 ng/mL	> 95%
IL-12	CHM03X053	HZ-1256-GMP	1-5 ng/mL	> 95%
IL-15	CHM03X083	HZ-1323-GMP	0.07-0.37 ng/mL	> 95%

Protein Name	Thomas No.	Mfr. No.	Activity (EC 50)	Purity
IL-28A	CHM03X044	HZ-1235-GMP	0.01-0.06 ng/mL	> 95%
LIF	CHM03X062	HZ-1292-GMP	0.045-0.25 ng/mL	> 95%
M-CSF	CHM03X029	HZ-1192-GMP	0.7-4.0 ng/mL	> 95%
Noggin	CHM03X014	HZ-1118-GMP	3-15 ng/mL	> 95%
PDGFbb	CHM03X072	HZ-1308-GMP	0.3-3 ng/mL	> 95%
SCF	CHM03W983	HZ-1024-GMP	15-85 ng/mL	> 95%
TGF Beta 1	CHM03W972	HZ-1011-GMP	0.01-0.17 ng/mL	> 95%
TGF Beta 2	CHM03X006	HZ-1092-GMP	0.018-0.18 ng/mL	> 95%
TGF Beta 3	CHM03X004	HZ-1090-GMP	0.15-0.75 ng/mL	> 95%
TNF Alpha	CHM03W974	HZ-1014-GMP	0.002-0.026 ng/mL	> 95%
VEGF165	CHM03W989	HZ-1038-GMP	0.3-3.75 ng/mL	> 95%
Wnt3A	CHM03X065	HZ-1296-GMP	25-125 ng/mL	> 95%
EGF	CHM03X086	HZ-1326-GMP	0.1-0.6 ng/mL	> 95%
OSM	CHM03W986	HZ-1030-GMP	0.1-1.5 ng/mL	> 95%
FGF-8B	CHM03X011	HZ-1103-GMP	10-60 ng/mL	> 95%
IL-21	CHM03X077	HZ-1319-GMP	0.25-1.25 ng/mL	> 95%
Transferrin	CHM03X074	HZ-1317-GMP	75-400 ng/mL	> 95%
BMP-7	CHM03X041	HZ-1229-GMP	50-275 ng/mL	> 95%
FGF-4	CHM03X038	HZ-1218-GMP	6-30 ng/mL	> 95%
TPO	CHM03X050	HZ-1248-GMP	100-500 ng/mL	> 95%
Thrombin (Coagulation Factor II)	CHM03X090	HZ-3010-GMP	1000-5000 units/mg	> 95%
BDNF	- - -	HZ-1335-GMP	4- 40 ng/mL	> 95%