



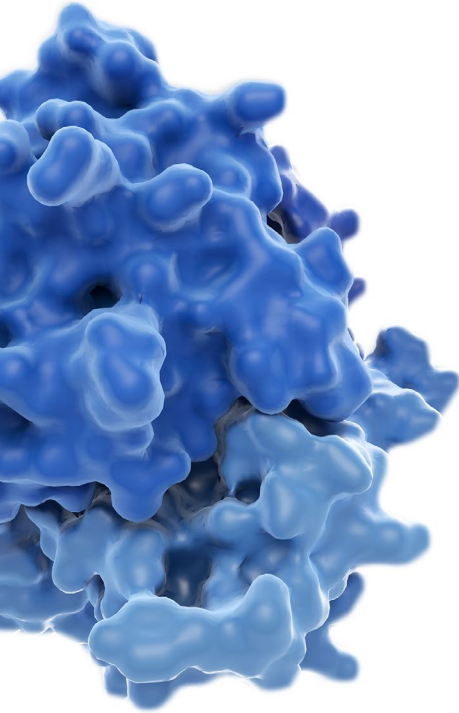
# Shenandoah CTGrade GMP Recombinant Human Proteins

OPTIMIZE CELL PROLIFERATION AND FUNCTION FOR IMMUNOTHERAPY

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# Shenandoah CTGrade GMP Recombinant Human Proteins



Shenandoah CTGrade GMP interleukins and growth factors are formulated to reduce variability and ensure predictable workflow performance in the proliferation and differentiation of T cells, natural killer (NK) cells, B cells, and chimeric antigen receptor T (CAR-T) cells.

Produced in *E. coli* systems, CTGrade GMP recombinant human proteins support a variety of cell culture applications including activation, expansion, and differentiation.

Designed to support basic, translational, and clinical research, as well as commercial applications, and they offer:

- High biological activity
- Low endotoxin levels
- $\geq 97\%$  purity
- High lot-to-lot consistency

Shenandoah CTGrade GMP interleukins and growth factors complement our PRIME-XV portfolio of chemically defined and serum-free media and reagents.

## Making the Right Decision the First Time

When designing robust cell and gene therapy processes, making the right decision the first time is critical for delivering therapies to market.

Shenandoah CTGrade GMP interleukins and growth factors are formulated to reduce variability and ensure predictable workflow performance in the proliferation and differentiation of T cells, natural killer (NK) cells, B cells, and chimeric antigen receptor CAR T cells.

Together with our unparalleled regulatory guidance and assurance of expected performance, CTGrade GMP interleukins and growth factors help cell and gene therapy developers proactively deliver the full promise of their discoveries.



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# Achieve Predictable Workflows and Reduce Variability with CTGrade GMP Interleukins and Growth Factors

The predictability and performance of CTGrade GMP interleukins and growth factors help cell and gene therapy developers accelerate delivery of life-changing therapies to market.

The biological activity of CTGrade GMP interleukins and growth factors is standardized, where applicable to WHO International standards, providing cell and gene therapy developers consistent, lot-to-lot biological activity and performance.

The CTGrade GMP products are manufactured in a facility that does not use or process beta-lactam containing materials. No animal- or human-derived materials were used during manufacturing or as ingredients. These products are manufactured, tested, and released in an ISO 9001:2015 certified facility following cGMP practices. USP chapter <1043> for ancillary materials has been considered in the manufacture of these products.

## Shenandoah CTGrade GMP Recombinant Protein Ordering Information

Item	Catalog #	Size*	Endotoxin LAL (EU/ug) ≤	ED <sub>50</sub> ≤	Bioactivity ≥**	Formulation
CTGrade GMP rh IL-2 <sub>C126S</sub>	500-01	50 µg 100 µg 1 mg	0.01	3 ng/mL	1.17 x 10 <sup>4</sup> IU/µg	0.1% trifluoroacetic acid (TFA)
CTGrade GMP rh SCF	500-02	50 µg 100 µg 1 mg	0.05	15 ng/mL	1.0 x 10 <sup>3</sup> IU/µg	10 mM sodium phosphate, 50mM sodium chloride, pH 7.5
CTGrade GMP rh FLT-3 Ligand	500-03	50 µg 100 µg 1 mg	0.05	5 ng/mL	1.6 x 10 <sup>3</sup> IU/µg	10 mM sodium phosphate, 50mM sodium chloride, pH 7.5
CTGrade GMP rh IL-3	500-04	50 µg 100 µg 1 mg	0.05	2 ng/mL	4.2 x 10 <sup>3</sup> IU/µg	10 mM sodium phosphate, 150 mM sodium chloride, pH 7.5
CTGrade GMP rh IL-4	500-05	50 µg 100 µg 1 mg	0.05	0.25 ng/mL	1.4 x 10 <sup>4</sup> IU/µg	20 mM sodium phosphate, pH 7.5
CTGrade GMP rh IL-6	500-06	50 µg 100 µg 1 mg	0.05	0.025 ng/mL	1.2 x 10 <sup>5</sup> IU/µg	Lyophilized from a sterile (0.2 micron) filtered aqueous solution

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## Shenandoah CTGrade GMP Recombinant Protein Ordering Information

Item	Catalog #	Size*	Endotoxin LAL (EU/ug) ≤	ED <sub>50</sub> ≤	Bioactivity ≥**	Formulation
CTGrade GMP rh IL-7	500-07	50 µg 100 µg 1 mg	0.05	0.5 ng/mL	1.2 x 10 <sup>5</sup> IU/µg	Lyophilized from a sterile (0.2 micron) filtered aqueous solution
CTGrade GMP rh IL-15	500-08	50 µg 100 µg 1 mg	0.05	1 ng/mL	2.0 x 10 <sup>4</sup> IU/µg	10 mM sodium bicarbonate, pH 8.5
CTGrade GMP rh IL-21	500-09	50 µg 100 µg 1 mg	0.05	5 ng/mL	Activity is > 1.1 x 10 <sup>6</sup> U/mg when calibrated against internal standard	10 mM sodium phosphate, pH 7.5
CTGrade GMP rh GM-CSF	500-11	50 µg 100 µg 1 mg	0.05	0.2 ng/mL	1.6 x 10 <sup>4</sup> IU/µg	10 mM sodium phosphate, pH 7.5
CTGrade GMP rh M-CSF	500-12	50 µg 100 µg 1 mg	0.01	10 ng/mL	1.02 x 10 <sup>5</sup> IU/µg	10 mM sodium phosphate and 50 mM sodium chloride, pH 8.0
CTGrade GMP rh EGF	500-14	50 µg 100 µg 1 mg	0.01	0.1 ng/mL	1.0 x 10 <sup>3</sup> IU/µg	Lyophilized from a 0.2 µm filtered solution containing 0.1% trifluoroacetic acid (TFA)
CTGrade GMP rh IL-10	500-16	50 µg 100 µg 1 mg	0.05	5 ng/mL	5.4 x 10 <sup>3</sup> IU/µg	10 mM sodium phosphate, pH 7.5
CTGrade GMP rh PDGF-AA	500-23	50 µg 100 µg 1 mg	0.01	50 ng/mL	Activity is > 1.0 x 10 <sup>6</sup> U/mg when calibrated against internal standard	Lyophilized from a 0.2 µm filtered solution containing 0.1% trifluoroacetic acid (TFA)
CTGrade GMP rh PDGF-BB	500-26	50 µg 100 µg 1 mg	0.01	5 ng/mL	1.6 x 10 <sup>3</sup> IU/µg	10 mM sodium phosphate, pH 7.5

\*Custom sizes and packaging available on request.

\*\* Bioactivity reference is calibrated against recombinant human WHO International Standard where applicable

Manufactured following cGMP practices in a facility that does not use or process beta-lactam containing materials, no histidine tags, and 0.2 micron filtered. No animal- or human-derived materials were used during manufacturing or as ingredients.



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