ScaleReady™

KEY CONSIDERATIONS FOR CYTOKINE SUPPLIER SELECTION FOR CELL THERAPIES

Within cell therapy manufacturing, GMP ancillary materials like cytokines are used as essential cell culture supplements to produce cell-based medicines. The success of the cell therapy will depend on the quality and consistency of these ancillary materials, making the choice of supplier a crucial decision to get right.

> *"RELATIONSHIPS WITH SUPPLIERS MUST BE MORE THAN TRANSACTIONAL"*

Effective partnering with your supplier is central to ensuring the security of supply and a reproducible manufacturing process leading up to the primary considerations of patient safety.

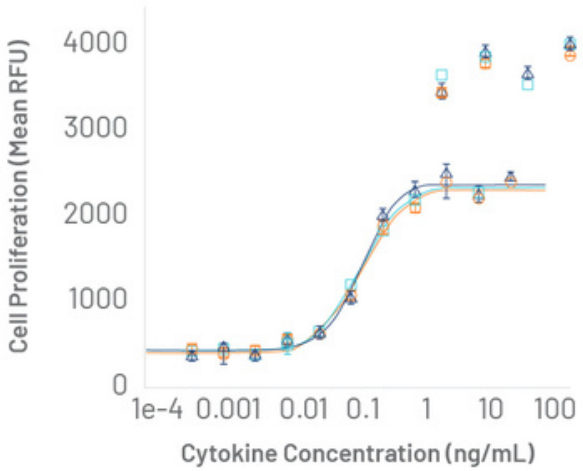
It's critical to address lot-to-lot consistency, supply chain reliability, patient safety, and the equivalence of RUO to GMP translation that will deliver the flexibility your cell therapy needs when transitioning from bench to bedside. It's vital to recognize that your relationships with suppliers must be more than transactional and that your supplier embraces an end-to-end process optimization focus.

Partnering with ScaleReady and our team of cell therapy optimization experts ensures the seamless transition from research into clinical production and commercial manufacturing by offering gold-standard cell and gene therapy portfolio products that support T and NK cell therapy programs. Confidence in bench to bedside should be offered at every step of this journey and the below key selection criteria are aimed at helping your program achieve successful commercialization.

scaleready.com/cytokines

RUO to GMP-GRADE EQUIVALENCY

A smooth transition into clinical production can be facilitated by integrating RUO-grade cytokines with equivalent GMP-grade options early in discovery. FIGURE 1. Equivalent bioactivity with RUO, animal-free preclinical, and GMP-grades of Bio-Techne's IL-2 cytokine as measured in cell proliferation assays. RUO, animal-free preclinical, and GMP-grades of human IL-2 (blue, orange, green, respectively).



CONSISTENCY

Cytokines are inherently prone to variability, due to their origins in biological systems. Partnering with the right suppliers will help to maintain production consistency throughout the lifecycle of a product. Spanning lots is almost inevitable, so to ensure consistency in cell culture, data from at least three past lots should be observed to confirm lot-to-lot consistency. If possible, testing material from three separate lots to examine the consistency in data (FIGURE 2 & 3) should be performed.

Controlling for assay variability can be managed using master control lots. These master control lots are tested with each new lot and should have identical activity every time. Variation in the activity of the known control is indicative of variability in the assay itself.

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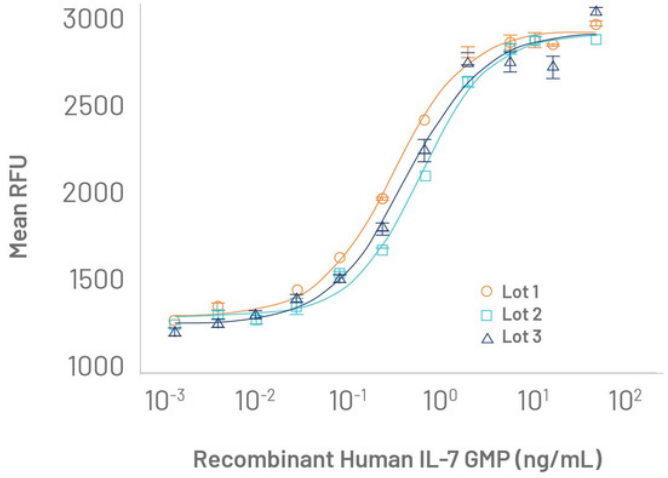

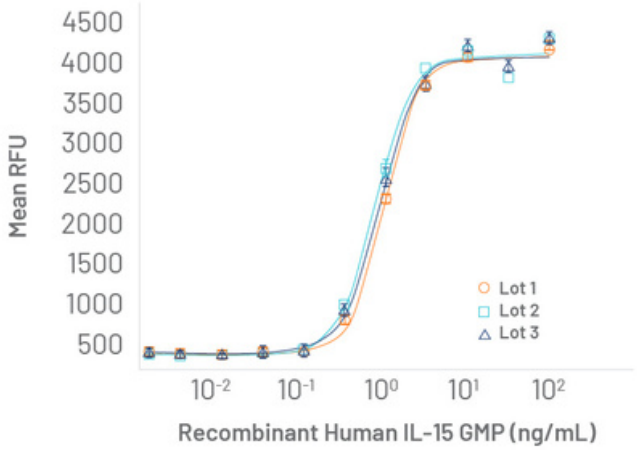

DON'T CUT CORNERS ON THE COST OF RAW MATERIALS. SELECT HIGH-QUALITY RAW MATERIALS FROM THE BEGINNING.

– MICHAEL PAGLIA
CHIEF OPERATING OFFICER
ELEVATE BIO, BASECAMP

FLEXIBILITY

Cell therapy programs are as diverse as the patients and diseases they seek to treat. This is why it's important to not only standardize product offers for best-in-class solutions, but also offer clients the flexibility where it is needed. All the animal-free RUO and GMP-grade cytokines offered in the ScaleReady portfolio can be custom bottled for specific program requirements. It is also possible to reserve lots and large lots to ensure that your program will have the cytokines support you need now and during your path to commercialization as quantities needed for evaluation, testing, and production use-cases ebb and flow through your program journey.

Having access to as much cytokine as you want, as much as you need, and when you need it is important when looking to future-proof a scalable cell therapy. Offering maximum flexibility as a chosen cytokine partner ensures that your cell therapy program is ready to tackle any program hurdles and overcome them with confidence as they arise.

SUPPLY CHAIN

> *"CHOOSING A PARTNER THAT CAN NOT ONLY GROW WITH YOU BUT ALSO OFFER EXPERTISE IN PROTEIN DEVELOPMENT AND MANUFACTURING, IS A CRUCIAL COMPONENT IN THE PATHWAY TO SUCCESS."*

Planning early and anticipating late-stage requirements will help to avoid disruptive changes later. Ensuring that a supplier can meet your needs through later-stage trials and commercialization requires a few considerations. First, lot size, including the history of lot size, lot-to-lot consistency, and past stability data should be queried.

A master supply agreement can give the supplier visibility of the client's needs, whilst also giving the client confidence that material will be available when required. Considering a secondary supplier will also decrease risk. These considerations should be made early on to avoid the necessity of significant changes to critical raw materials, like cytokines and growth factors, mid-stream.

Bio-Techne 55,000 sq. ft. animal-free GMP facility located in St. Paul, MN USA

ScaleReady sources its cytokines from the Bio-Techne animal-free GMP manufacturing facility in St. Paul MN because we recognize the growing demand for larger quantities of critical cytokines. This expansion capability, combined with stringent quality control and experienced regulatory support, allows us to offer industry-leading GMP proteins for cell therapy manufacturing at scale.

PATIENT SAFETY

The success of treatments while ensuring absolute patient safety in trials and commercialization of cell therapies cannot be overstated. In addressing this critical factor regarding cytokine suppliers, your program should ensure two key aspects are met, that your vendor can ensure the raw material is animal-free and that you can test multiple lots of cytokines to mitigate risk, lot bridging and future-proofing.

Testing on cytokines should involve identity testing, such as end-terminal sequence or mass spectrometry. These tests should also go hand-in-hand with activity tests as well as detailed purity specifications that give your program the in-depth analysis of the protein configuration that will impact performance and patient safety.

Testing to USP71 or equivalent is a sterility benchmark of pharmaceuticals. Your chosen cytokine supplier should be able to provide this as well as a variety of testing completed for adventitious agents and endotoxin specification mycoplasma, host cell DNA testing and host cell protein testing. The type of testing that has been completed is available from the CFAs included in the product.

The definition of animal-free varies across suppliers. With ScaleReady, our GMP-grade cytokines are from Bio-Techne and produced in the only publicly known animal-free facility dedicated for ancillary material manufacturing located in St. Paul, MN USA. Your chosen cytokine supplier should provide you with a certificate of origin that proves that your cytokines are manufactured in an animal-free process without animal components in a GMP-grade facility.

Bio-Techne has the strictest definition of GMP-grade, animal-free. The St. Paul facility incorporates dedicated, controlled access within the animal-free laboratories to ensure that there's no contact with animal components or byproducts anywhere in the purification or production processes. You should be armed with the correct understanding of animal-free to ensure that the cytokines and growth factors offered can truly have that animal-free label. Both RUO animal Free and GMP proteins are manufactured within the same facility to ensure seamless RUO to GMP transition.

Learn More about ScaleReady Cytokines:

Contact us: info@scaleready.com

ScaleReady is a Joint Venture formed by Bio-Techne, Fresenius Kabi, and Wilson Wolf. Combining selected offerings from the three partners, the ScaleReady manufacturing platform combines tools and technologies for cell culture, cell activation and expansion, gene editing, and cell processing.

bio-techne FRESENIUS KABI WILSONWOLF

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