Making an informed decision: demystifying custom media development

Choosing a cell culture media formulation is one of the most important decisions for biopharmaceutical developers during early-phase process development. Using a medium optimized for your specific process is crucial to maximize yields, meet critical quality attribute (CQA) targets, and maintain process consistency.

However, at this early stage there is a key choice to make: utilize an off-the-shelf catalog formulation or develop a custom formulation—either in-house or through working with an external media development collaborator.

When it comes to creating a custom medium, you may have some initial preconceptions about the overall cost and time investment needed, and whether this is aligned with your commercial goals. This may be particularly true if you are working with a well-established modality, such as a monoclonal antibody, as many catalog options can often deliver high titers with little or no additional optimization. You may also have other concerns, such as potentially higher prices, longer lead times for custom media, or perceived over-dependence on a single supplier.

Although these considerations are valid, utilizing custom media can be a powerful way for biopharmaceutical companies to meet or exceed the demands of a drug development process. When working with more established modalities, a custom formulation could help optimize a process and improve productivity. For less established modalities, such as cell and gene therapies, custom media might be the only suitable option to help maximize process performance and reach challenging titer and CQA targets.

In this article, we will explore four of the most common concerns surrounding custom media development, discussing how you can avoid potential challenges and get the most from your custom formulation.

Utilizing custom media can be a powerful way for biopharmaceutical companies to meet or exceed the demands of a drug development process.

gibco

Cost

One potential barrier to pursuing a custom formulation can be the additional cost of development. At first glance, any added cost may not appear economically advantageous when compared to catalog media. However, the substantial long-term productivity benefits that can be gained would likely more than offset the greater upfront costs that may be incurred during the initial development process.

Custom formulations are specifically tailored to your process, helping you maximize the performance of your chosen cell line and workflow. This can eliminate the need for further process optimization during the later phase of drug development, which can often be cost-, time-, and labor-intensive.

Moreover, if you choose to work with a media development collaborator, these benefits can be elevated further. A supplier with expertise in custom media development will approach projects with scalability in mind. In practical terms, this will mean that the supplier will verify the manufacturability of the formulation and its suitability for conversion into different formats during development. Ultimately, this will result in a formulation that is suitable for use from early development to clinical trials and commercialization, helping reduce the risk of costly additional optimization.

Speed-to-market

In addition to cost considerations, some developers may also be concerned that custom formulation development and optimization can lengthen process development timelines. However, this can often depend on when the decision to develop a custom formulation is taken.

For example, if you choose to explore custom media before looking at catalog options or conducting a panel evaluation, you may be able to jumpstart or shorten the development cycle. This is because custom media formulations can be delivered in relatively short timeframes, depending on the project's complexity.

Even if the project requirements are more complex, there are also considerable timeline-related benefits of having an optimized and scalable formulation from the early stages of development. Notably, in addition to reducing costs, removing the need for additional, late-stage media optimization may also increase speed to market.

Many experienced media collaborators provide support and expertise for the lifetime of the custom formulation. Through this support, you can more efficiently and effectively implement the formulation into your process and optimize your workflow for maximum productivity. This support can also help free up internal resources which can be reallocated in order to accelerate other parts of process development and scale-up.

Project flexibility

Many biotherapeutic developers will be entering the customization process through a catalog option that requires further optimization or a media or feed panel evaluation. However, the end goal will vary widely from project to project. Some developers seek help with a specific area of media development and others are looking for full end-to-end support.

When working with an external collaborator, you may be concerned that custom media and feed development is an inflexible process that won't be suited to your individual requirements. For example, you may want the flexibility to stop, change, or rescope the project, gain access to the optimized formulation, or the ability to source the optimized formulation from a secondary supplier. In practice though, this is often dependent upon the specific collaborator and its capabilities.

To get the most from your media development collaboration, you should look for a vendor that prioritizes flexibility and facilitates access to differing levels of support as required.

To get the most from your media development collaboration, you should look for a vendor that prioritizes flexibility and facilitates access to differing levels of support as required. This should include options that range from minor customization of catalog products to full media development and optimization support.

Supply assurance

Supply assurance is critical for the long-term success of any biotherapeutic manufacturing workflow. It not only gives manufacturers confidence that they will have a reliable supply of media throughout the development process, but also that they can produce their biologic drug at commercial scale.

When using a custom formulation, the risk of becoming dependent on a single supplier is another possible concern, particularly for smaller companies outsourcing any of their manufacturing operations. Disruptions in media supply can lead to costly production delays or loss of pre-scheduled CDMO manufacturing slots, which can be detrimental to the overall economic feasibility of a process.

As such, supply assurance should be at the forefront of your mind when choosing a custom media development collaborator. Often it can be advantageous to work with a collaborator with integrated cGMP manufacturing capabilities. This is because, alongside having in-depth knowledge of the formulation, it is also likely to use the same raw materials during development and manufacturing, reducing the risk of variability.

When assessing a media development collaborator's supply assurance, there are several important factors to look for. These include a robust supply network with validated secondary and tertiary raw material supplies, global manufacturing redundancy, and proven equivalency (e.g., milling and blending technology, QA/QC harmonized testing, packaging, etc.) between media manufacturing sites. The collaborator should also understand the importance of supply security and work with you to support the qualification of a secondary manufacturer of your custom formulation if required.

Careful assessment is key

Before undertaking custom media development, it is vital for you to carefully evaluate your process requirements and targets. This is crucial to assess whether a custom formulation will be worthwhile. Equally importantly, if a custom option is chosen, you must assess whether the support of a development collaborator would be beneficial to help you meet all of your goals.

Ultimately, the decision to develop a custom medium formulation will depend on your specific project requirements. However, when making this decision, you can be confident that by choosing a knowledgeable and experienced collaborator many potential concerns can be offset, and long-term productivity benefits gained.

Learn more at **thermofisher.com/mediabydesign**