

Technical Bulletin

Preparing and Filtering Serum-Free Media

As serum-free media become more complex, solubility and filterability become factors in preparing a liquid medium from a powder. Serum-free media formulations generally contain high concentrations of amino acids and vitamins along with various proteins, hydrolysates and Pluronic® F68 which have pushed their formulation weights to exceed 40 grams per liter. This is approximately four times greater than standard basal media such as RPMI 1640 (10.4 g), Dulbecco's Modified Eagle's Medium (DMEM) (13.38 g) and Modified Eagle's Medium (MEM) (9.39 g). In order to prepare these serum-free media, preparation protocols may need to be altered to ensure complete dissolution.

Several critical factors influence the solubility and filterability of these media — water temperature, mixing time both before and after pH adjustment, rate of powder addition, minimum water volume and filter type. If these factors are not optimal, the effects on serum-free media can include slow filtration times, plugged filters, removal of key components and changes in osmolality.

To filter large volumes (greater than 20 liters) of serum-free media, it is critical that the proper filter train is used. Insufficient filter capacity can cause excessive filtration time due to filter blockage. Likewise, excess filter capacity can strip vital proteins and growth factors from the medium as well as add unnecessary cost to the media preparation. Low protein-binding filters are recommended, preferably polyvinylidene fluoride (PVDF) or cellulose acetate (CA), for serum-free media filtration.

For every 10 L of serum-free media, the following typical filter train is recommended:

- 0.33 ft² (0.0306 m²) of a 0.45 µm prefilter
- 0.17 ft² (0.0158 m²) of a 0.2 µm prefilter
- 0.056 ft² (0.0052 m²) of a 0.2 µm final, sterile filter

SAFC Biosciences cannot guarantee the above filtration scheme will work for all products.

Please refer to Product Information Sheets for preparation and filtration information pertaining to specific EX-CELL™ Serum-Free Media products.

For more information about this subject or other SAFC Biosciences' products and services, please call our Technical Services department.

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