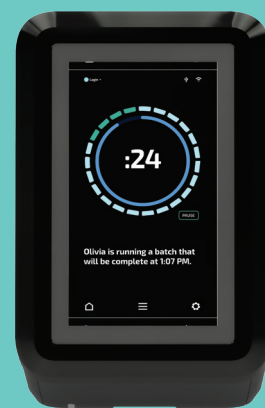


Screening of chemically-defined media for suspension cultures of HEK293 cells.



BACKGROUND

With a history of stable growth and easy transfection, HEK293 cells have been a workhorse cell line in cell biology and bioprocessing labs. Originally derived from human embryonic kidney cells grown in tissue culture, HEK293 cell lines are commonly used to produce both therapeutic proteins due to high efficiencies of transfectability and viral vectors such as lentivirus and adeno-associated virus (AAV). HEK293 was derived from adherent cells that prefer a compatible surface for growth, but this had limited the scalability of the platform. Therefore, there has been a desire to improve both process productivities and consistencies of the adherent HEK293 cells grown in serum-supplemented media. As a result, processes have been adapted for culturing of HEK293 cells in suspension and with serum-free, chemically-defined cell media.

THE EXPERIMENT

Commercially available chemically-defined cell media from four vendors were tested in this study. Individual samples of each fresh serum-free media (without Gln) optimized for suspension cultures of HEK293 were diluted 100X with the Rebel™ diluent, placed into a vial, and run for five replicates each with no additional sample preparation. (Figure 1)

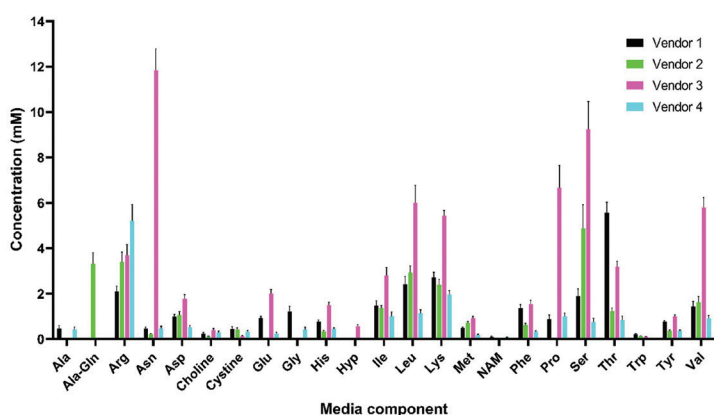


Figure 1: Media component concentrations from chemically-defined HEK293 media from four different vendors. Error bars are from the standard deviation of n = 5 replicates.

DISCUSSION

Across the four vendors, there was a high variation in the fresh media composition. For instance, the dipeptide Ala-Gln was only detected in vendor 2, whereas hydroxyproline (Hyp) was only detected in vendor 3. Asparagine (Asn) was 25x higher in vendor 3's media compared to the next highest composition. Vendor 3 had the highest concentration in roughly two-thirds of all the detected components in the study. In contrast, vendor 4 had the lowest concentration in over half of the components. In its entirety, researchers can utilize this type of quick media screen to survey their cell media options before investing in a media platform for their HEK293 suspension processes. Carrying this type of analysis forward whenever a fresh media batch is received or periodically during storage, would establish a historical record to refer to in case any unexpected variations arise in the culture's health and productivity.

