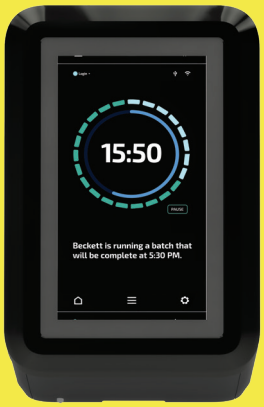
REBEL

APPLICATION SNAPSHOT

Comparing component levels of basal cell media with 10% fetal bovine serum.



BACKGROUND

Dulbecco's Modified Eagle Medium (DMEM), Iscove's Modified Dulbecco's Medium (IMDM), and Roswell Park Memorial Institute media (RPMI) are three of the most common cell media formulations used in cell culture processes. These chemically-defined media are protein-free and have specific formulations of amino acids, vitamins, minerals, and other components added to suit a cell line's nutrient needs. For certain types of cell cultures and processes (e.g., stem cells, T and B cells, fibroblasts, hybridomas, HEK293, leukemia cells, plant cells, insect cells, etc.), these basal media are usually supplemented with fetal bovine serum (FBS) at 10% v/v. The FBS addition supplements the proteins, lipids, and growth factors necessary to sustain cell viability and growth, and to make the cultures adaptable to changes in pH, temperature, osmolality, or other culture dynamics. However, FBS supplemented media is challenging to assay with traditional chromatographic approaches. The serum proteins can interfere with the chromatography. Sample preparation with protein precipitation may interfere with media component recoveries resulting in biased results of fresh or spent media analysis.

THE EXPERIMENT

A commercially available DMEM, IMDM, and RPMI media without glutamine and cell culture grade FBS (USA origin) were tested at the levels indicated below. All media samples were handled following the manufacturer's instructions. Final solutions were diluted 10x before analysis on the Rebel with no additional sample preparation. (Figure 1)

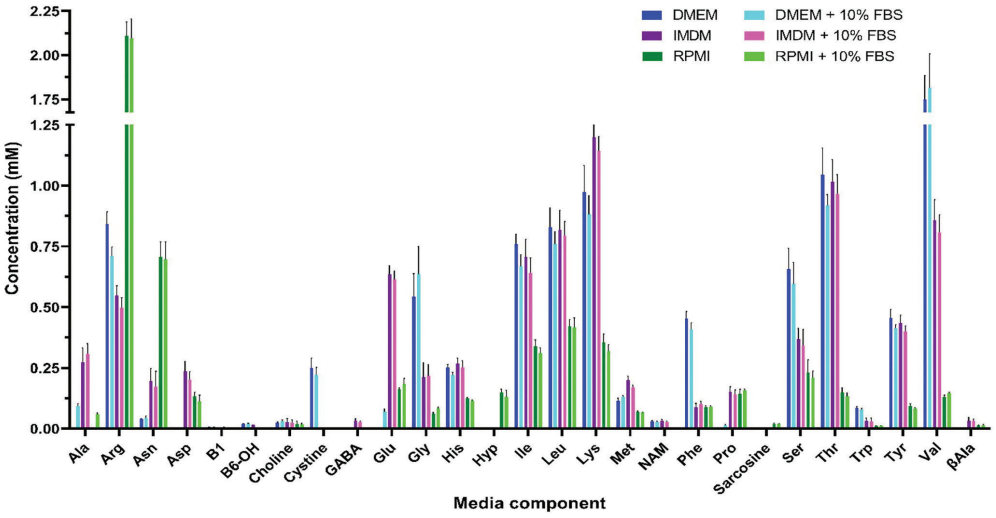
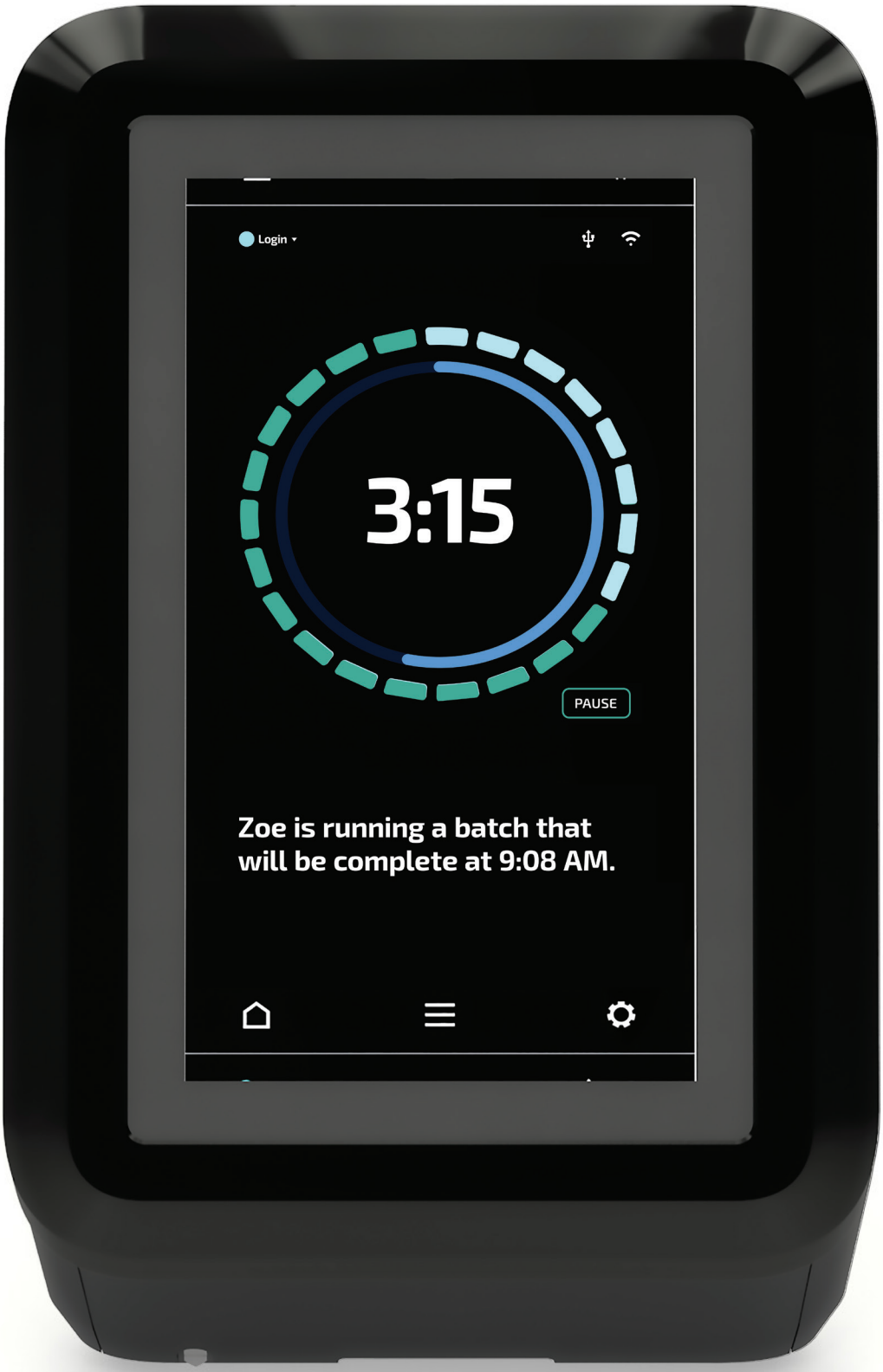


Figure 1: Media component concentrations from basal media without and with 10% FBS supplementation. Error bars are from the standard deviation of n = 5 replicates.

DISCUSSION

When comparing standard basal media compositions with and without FBS supplements, there were almost no differences in the media component levels for each type of media. For DMEM media, the formulations without FBS were very similar, within experiment error, for all nutrients added. However, low levels of Ala, Glu, and Pro were all detected with 10% serum supplementation. These three amino acids are not present in the DMEM formulation, so FBS supplementation indicates the addition of those components at very low levels. There were no significant changes observed in the IMDM media with and without serum. RPMI media does not include Ala in the formulation, but Ala was detected in the 10% FBS supplemented sample. Like the DMEM results, this indicates that the small amount of Ala added from the FBS was large enough to be detected in the serum-supplemented media sample. Using the Rebel, one can routinely monitor these slight changes of media components as the serum is added to the basal media formulations. This practice can support reproducible culture processes and media preparations for a variety of cell lines.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3:15
PAUSE
Zoe is running a batch that
will be complete at 9:08 AM.