PATsmart™ REBEL® System: Investigating the High Nutrient Variations in Super Optimal Broth

Technical Note

Repligen Corp. now owns the life sciences PAT product portfolio of 908 Devices Inc. Please contact Repligen for further inquiries.

Background

Super optimal broth (SOB) is a nutrient-rich microbiological medium used for bacterial growth, typically with recombinant *E. coli*. Compared to lysogeny broth (LB) media, SOB media results in higher plasmid transformation efficiencies. SOB media has more peptone compared to LB media and includes magnesium sulfate and potassium chloride. SOB media differs from SOC (SOB media with catabolite repression) medium due to its lack of glucose. Like other undefined media prepared from mixtures of digested proteins and yeast extracts, there can be variability in formulations due to processing changes and raw material sources. Therefore, culture growth rates and productivities may differ when different vendor's media are used in otherwise identical experiments.

The Experiment

All commercially available SOB liquid media were tested fresh and handled following the manufacturer's instructions. All samples were diluted 500X before analysis on the PATsmart™ REBEL® System with no additional sample preparation.

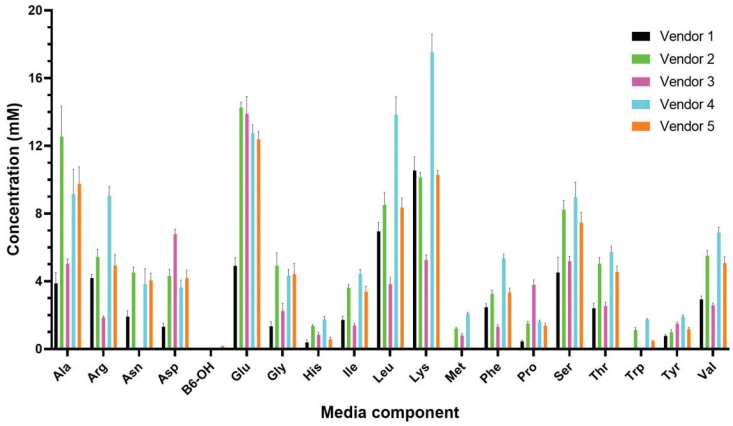

Figure 1. Media component concentrations from super optimal broth media diluted by 500X before analysis. Error bars are from the standard deviation of n = 5 replicates.

Discussion

There was minimal similarity in the concentrations of most components across all five vendors' SOB media. In fact, there was not a single component that had variations within 30% of the average value of all five vendors. Pyridoxine (B6-OH) was only detected in vendor 5's media. Asparagine (Asn) was not detected in vendor 3, methionine (Met) was not detected in either vendors 1 or 5, and tryptophan (Trp) was not detected in the media of vendors 1 or 3. The most considerable deviations from the average individual components levels were proline (Pro) in vendors 1 and 3. It was detected 74% lower and 117% higher, respectively, than the average concentration.

Also, vendor 4 had high detected levels of arginine (Arg), histidine (His), and phenylalanine (Phe) that were 78%, 77%, and 70% higher than the averages, respectively. The extremely high variability in the concentrations of individual media components suggests little similarity across different commercial sources of SOB media. Teams should test media before use, and especially when switching suppliers, to maintain uniformity across experiments.

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