

QUANTITATION OF AMINO ACIDS IN DIVERSE MAMMALIAN CELL CULTURE MEDIA TYPES WITH THE REBEL AT-LINE ANALYZER

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A typically chemically defined media contains 50 to 100 ingredients including sugars, amino acids, vitamins, amines, trace metals, and buffer. Amino acids are critical to cellular functions such as protein synthesis and providing a source of energy. Individual amino acid levels have been linked to additional roles such as mitigating the effects of ammonia production and determining rates of apoptosis in cells. Measuring amino acid levels by traditional methods such as HPLC requires experienced operators with specialty optimizing and maintaining analytical methods. This creates bottlenecks and backlogs in generating amino acid results within actional timelines for media optimization.

The REBEL analyzer has been developed to quantitative amino acid levels in under 10 minutes per sample. Sample prep is simplified to filtration and a single sample dilution (10x, 100x, etc.). Automated algorithms provide quantitative results without requiring spectral interpretation from the user. Dilution factor optimization is simple as automated algorithms to determine the best dilution factor for the specific media. System health and performance is confirmed through automated testing with simple Pass/Fail reporting. A total of > 50 commercially available CHO, HEK293, T-Cell, basal, and insect media were analyzed on the REBEL analyzer to quantitative amino acid levels in the fresh media. Differences in amino acids between media types (CHO vs. HEK293, etc.) and within single media types will be presented. For example, Alanine was undetected in 4 of 13 CHO media but also varied in concentrations by 14x for media in which it was detected. Comparing media types, amino acid levels were generally >10x higher in insect media than T-Cell media.

Producing diverse therapeutics requires fast analytical answers to complex samples. Fresh and spent media analysis of amino acids in under 10 minutes provides fast answers traditionally acquired in days to weeks externally to the process development laboratory. The REBEL accelerates media development from early-stage experiments with commercial medium through customized, non-standard, and highly specialized medium. The REBEL is designed to handle each stage of this process across cell types and applications.