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Amino acid analysis used in industry

Amino Acid Analysis (AAA) of free amino acids allow for the analysis of raw materials such as food stuff, nutraceuticals, supplements, effervescent tablets, animal feeds, and even blood samples for newborn screening to allow detection of inborn metabolic errors. Recent renewed interest in metabolomic studies has increased the need for sensitive and accurate methods for the analysis of physiological amino acids found in biological samples such as blood, serum, urine as well as neurons. AAA allows for the quantitative analysis of compounds containing primary and secondary amino groups. AAA has become the gold standard for quantitative analysis of free amino acids as well as amino acids released from peptides and proteins via hydrolysis. Amino acid analysis was introduced as an analytical technique in 1959 by Moore and Stein. Since then many improvements in instrument development and design have been made, including the GC-MS and LC-MS/MS-based methods. As instrument and column technology improved, several automated or semi-automated methods for amino analysis have been developed. Two types of analysis methods emerged for automated amino acids: (1) Post-column derivatization, and (2) Pre-column derivatization based amino acid analysis. Over the years, several UV-absorbing and fluorescent derivatization compounds have been investigated and are now available for pre-column derivatization. However, for post-column derivatization, ninhydrin is the sole derivatization compound used. To this day, amino acid analysis has remained the gold standard for amino acid analysis. However, for dietary supplements there appears to be presently no standard method available. A brief history of amino acid analysis, as well as instrumentation and methods used, will be discussed.

Biography

Klaus D Linse has earned his PhD in Cell Biology/Biochemistry at the University of Hamburg, Germany, investigating microtubule proteins at the Max-Planck-Institute for Medical Research in Heidelberg and at DESY Hamburg. He is currently a Director of Scientific Operations at Biosynthesis Inc., in Lewisville, Texas. After receiving his PhD, he held positions at Porton Instruments Inc., and Beckman Instruments in instrument development and support. In 1944, he accepted position as Core Facility Director at the University of Texas at Austin. From 2009 to 2012, he was employed as a Senior Research Scientist II at XBiotech Inc., Austin, Texas, in Mass Spectrometry analyzing therapeutic monoclonal antibodies.

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