BHIMADZU

Analysis of Hemoglobin Variants using an Automated Sample Preparation Workstation Coupled to LC-MS

Rachel Lieberman¹, Brian Feild¹, Kevin Meyer², Nick Herold², Scott Kuzdzal¹ ¹Shimadzu Scientific Instruments, Columbia, MD ²Perfinity Biosciences, Inc., West Lafeyette, IN

Introduction

Hemoglobinopathies are genetic defects that result in one of the chains of the hemoglobin molecule. These are usually single-gene disorders, such as sickle cell disease, and they are usually inherited as autosomal codominant traits. There are over 2000 known hemoglobin variants and identification of these variants is important to a patient's health. It is important to be able to structurally identify and quantitate these variants in order to detect abnormal hemoglobin quickly and precisely. It is necessary to reduce sample complexity to avoid exceeding the analytical limitations of the mass spectrometer. This poster will discuss the use of an automated sample preparation system coupled to mass spectrometry to quickly and reproducibly identify differences between normal and abnormal hemoglobin.

Methods

The Perfinity Workstation is a fully integrated online protein sample preparation workstation, combining the selectivity of immunoassay approaches with the resolution of high performance liquid chromatography and is easily coupled to a mass spectrometer.

- Automates and integrates five key proteomic workflow steps:
 - Affinity Selection
 - Buffer exchange
 - Trypsin digestion
 - Desalting
 - Reversed phase LC
- Reduces sample preparation times from 24 hours to less than 1 hour
- Acheives exceptional reproducibility (CV less than 10%)





