

Title – Automated Derivatization of Amino Acids with Agilent 1260 Infinity II LC System.

Program of Study – School of Health Sciences

Presentation Type – **Choose one of the following:** Poster Presentation

Subtype – **Choose one of the following for poster or oral presentation types:**

Experimental (Basic)

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Abstract:

The food crisis is among the top growing global issues. Algae is an economical solution for food shortages as the amino acids found in algae can be used to produce food sources for animals. Qualitative and quantitative identification of amino acids in algae samples can be used to optimize algae growth for protein and amino acid production. This study aimed to continue method development for identifying amino acids in algae samples using an automated, online derivatization HPLC (High Performance Liquid Chromatography) method to increase precision and efficiency. An automated method relies on the instrument to draw and mix the derivatization reagents, diluent, and samples. The development of this method will allow for a time efficient analysis of amino acid content in algae samples. Existing automated, online amino acid derivatization methods available for other liquid chromatography instruments were modified for the Agilent High Performance Liquid Chromatography (HPLC) 1260 Infinity II. Different method parameters, sample/standard concentrations, derivatization agent stability, and instrument conditions were evaluated during the development of the automated method. Initial method testing involved the use of only a few amino acids. In the future, additional individual amino acids should be run to determine a complete profile for common amino acids found in algae. Additionally, single amino acids should be run at varying concentrations to further develop the quantitative aspect of the method.

Christian worldview integration:

Food crises are inflicting countries around the globe. With increases in population, more land is dominated by people, and less is left for agriculture. Algae contains a variety of amino acids that can be used for raising animals for food, or even as a nutritional source itself. Analyzing the algae for what amino acids are present in a culture is necessary in order to determine what additional amino acids are needed in order to be sufficient for food sources. In addition, analyzing samples via HPLC can hint at how algae growth can be maximized for amino acid production. From a Christian standpoint, the sanctity of human life is important. In an effort to help those in food crises, analyzing amino acid content in algae is a way in which we can help minimize mortalities. Minimizing food crises, however, is only a temporary solution to an eternal problem in that people will eventually die. Efforts to increase longevity of life are in vain if the opportunity is not used to share the Gospel with people. This research not only opens up opportunities to share the Gospel with those in the middle of food crises, but other researchers involved in this field. Helping those who are suffering to further the Kingdom falls in line with a Christian worldview perspective. In the science world, the sanctity of human life and its uniqueness is not always upheld in the highest regard. As Christians we can set the example and demonstrate God's love for mankind by helping those in crises.