

Projektexamenskod: BBTX11-23-05

Avdelningen för Livsmedelsvetenskap och nutrition
Institutionen för biologi och bioteknik, Chalmers tekniska högskola

Projektförslag för kandidatarbete inom inst. Kemi och kemiteknik och Biologi och bioteknik

VALIDATION OF AN EXTENDED METHOD FOR ANALYSIS OF SHORT-CHAIN FATTY ACIDS AND GUT MICROBIOME METABOLITES IN PLASMA

Bakgrund

Gut microbiota plays an immense role in health and it often interacts with specific diet components to generate specific metabolites. These metabolites are important mediators of the effects on physiological processes of importance to health, such as glycemia, lipid metabolism. An important group of metabolites generated by the microbiota is the short chain fatty acids, such as acetate, propionate and butyrate and their corresponding branched analogues. Butyrate is a major energy source for the colonocytes, has anti-inflammatory properties and have recently along with other short-chain fatty acids been shown to have major systemic effects related to future disease risk. Other metabolites such as indole proionic acid, lactate and indoles have also started to be explored but a method for high-throughput analyses in plasma samples is still lacking.

Problem beskrivning

The aim of this project is to extend and validate an existing method for short-chain fatty acids in plasma with several other gut microbiota derived metabolites using HPLC-MS/MS. The method may be applied to any specific dataset, depending on time available.

Genomförande /Viktiga moment/teknikinnehåll

1. a. Extend an existing, well functioning method for analysis of SCFA with another set of important fermentation products using LC-MS/MS.
2. b Optimize analytical conditions, including chromatography and MS conditions for sensitive and robust quantification.
3. c Validate the method according to commonly used bioanalytical validation criteria

Speciella förkunskapskrav: Curious mindset and interested & motivated to set up and evaluate a bioanalytical method that will be extensively used to solve scientific research questions in nutrition.

Möjlig målgrupp: bioteknik, Bt, Kemiteknik, K och Kemiteknik med fysik, Kf

Gruppstorlek: 4-6 studenter

Förslagsställare/kontaktperson/huvudhandledare: Dr. Rikard Fristedt

Övriga handledare: Professor Rikard Landberg