Poster #: 476
Abstract #: 2187
Abstract Title: Host: microbiome co-metabolic processing of dietary polyphenols – an acute, single blinded, cross-over study with different doses of apple polyphenols in healthy subjects
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Abstract Submission:
Apples are one of the most commonly consumed fruits and yet we still do not fully understand how they are metabolized by the human body. Here we studied the nutrikinetics of apple polyphenols in cloudy apple juice and polyphenol-enriched apple juice using LC-HRMS based metabolite profiling. Healthy volunteers participated in an acute single blind controlled crossover study in which they consumed 250 mL of cloudy apple juice (Crispy Pink apple variety), or 250 mL of the same juice enriched with an apple polyphenol extract (750mg). Plasma, and urine were collected at time 0, 1h, 2h. 3h, 5h, together with a 24h urine sample. Faecal samples were collected from each individual during the study for 16S rRNA gene profiling. 110 metabolites were significantly elevated following intake of polyphenol enriched cloudy apple juice. Single intake of the enriched apple juice did not significantly alter the gut microbiota composition but faecal bacteria were correlated with specific microbial metabolites derived from apple polyphenols. Human metabolism of apple polyphenols is a co-metabolic process between human encoded activities and those of our resident microbiota. Here we have identified specific blood and urine metabolic biomarkers of apple polyphenol intake and identified putative associations with specific genera of gut bacteria, associations which now need confirmation in specifically designed mechanistic studies.