

## Lipid Science & Technology

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## Effects of exposure to biodiesel exhaust on human plasma lipid profiles detected by GC-TOFMS metabolomics

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Biodiesel is a renewable fuel mainly consisting of esters, whereas petrodiesel is mainly paraffinic and aromatic. Replacing petrodiesel with biodiesel may have beneficial effects in ecology; however, public health effects are still unknown.

In this project our goal was to study the effect of exposure to rapeseed methyl ester biodiesel and petrodiesel (DE) exhausts on human plasma metabolites. 19 non-smoking healthy males were exposed to DE or biodiesel exhaust for one hour in a randomized order. Peripheral blood was sampled at five time points: pre-exposure as well as two, four, eight and 24 hours post-exposure.

A methanol/water based protocol was used on the plasma samples for extraction of low molecular compounds (<900 Da). This was followed by derivatization and analysis using gas chromatography coupled to time of flight mass spectrometry (GC-TOFMS). Using in-house script, data were processed which enabled identification and quantification of 73 metabolites, including 14 lipids.

As a part of data analysis, univariate, ANOVA and multivariate analysis were used to examine the results and highlight metabolite, including lipid, profiles characteristic of each type of exposure in relation to its time of sampling. Preliminary results showed different responses in some lipid profiles e.g. octadecanoic acid after biodiesel exhaust exposure compared to DE exhaust exposure.

To our knowledge, this is the first time that a randomized controlled trial followed by metabolomics analyses has been performed to investigate the effect of biodiesel exhaust exposure on human plasma metabolite/lipid profiles.

## Biography

Masoumeh Karimpour is a PhD student at Umeå University working on non-targeted Gas Chromatography Mass Spectrometry methods focusing on effects of exposure on human metabolite profiles, mainly covering lipids, amino acids, sugars and organic acids.

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