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Drug delivery related to metabolites in human breath – first results of long term clinical studies using MCC/IMS

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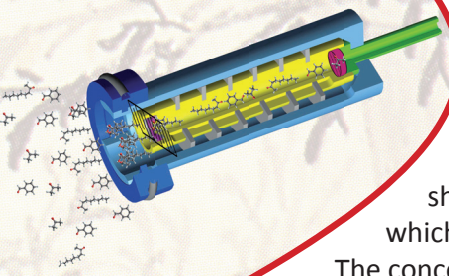
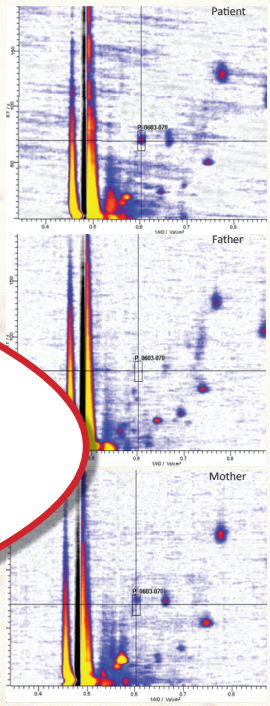
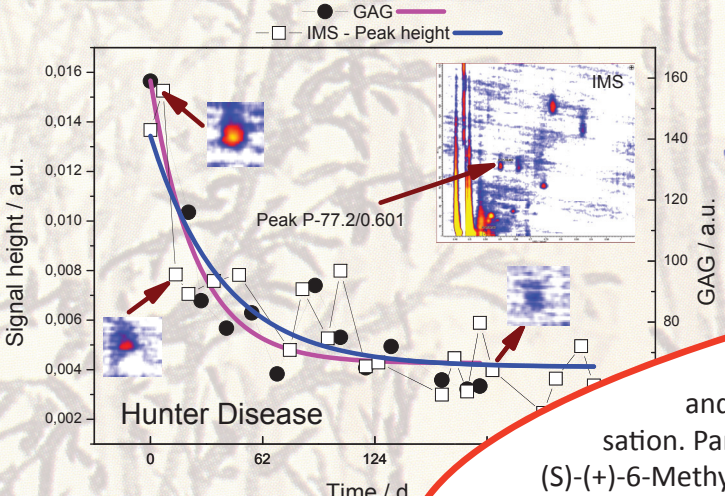
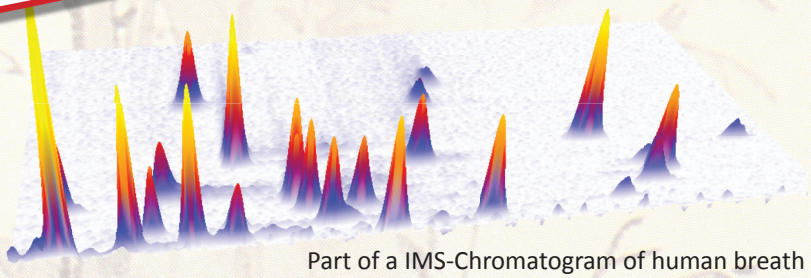


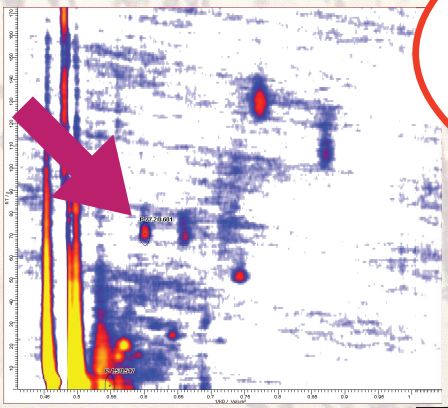
Hunter disease is a mucopolysaccharidosis for which enzyme replacement therapy with idursulfase has been offered for 3 years. Therapy can be monitored by the urinary concentration of dermatan sulfate and heparin sulfate. A 38-year-old male person suffering from Hunter disease has been treated with idursulfase for a year, showing dramatic clinical improvement. Additionally to the monitoring of urinary excretion of metabolites the patient had breath analysis using MCC/IMS every week before enzyme replacement. The patient showed increasing concentrations of a peak P-1.5/0.547 which is related to acetone [67-64-1] over the time. The concentrations were higher than the concentrations of all patients ever tested with MCC/IMS.







Part of a IMS-Chromatogram of human breath



Furthermore, a peak P-77.2/0.601 was found, which decreased after few weeks of therapy and needs further biochemical characterisation. Parallel GC/MSD investigations suggest (S)-(+)-6-Methyl-1-octanol[110453-78-6], Cyclohexanone, 5-methyl-2-(1-methylethyl)- [10458-14-7], Benzaldehyde, 2,5-dimethyl- [5779-94-2], Ethanone, 1-(4-methylphenyl)- [122-00-9], Dodecane [112-40-3] or Decanal [112-31-2].

These preliminary data show that breath analysis in patients with metabolic disorders might give further information about metabolism, especially under enzyme replacement therapy.

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