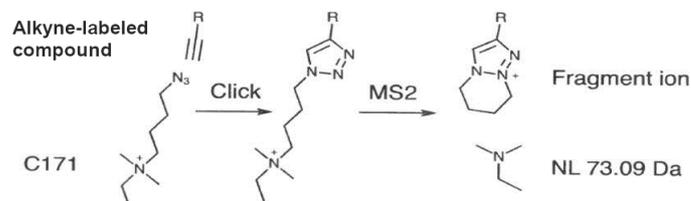


# Click-Mass Spectrometry of lipids

## Click-MS spectrometry to trace metabolism of fatty acids and sterols

### Invention

Aberrations in fatty acid metabolism are associated with pathological states and have become a focus of current research, particularly due to the interest in metabolic overload diseases. Special



MS detection method in principle

Mass spectrometry may help to understand and detect diseases such as metabolic syndrome or type 2 diabetes. For studying the lipid metabolism, it is common that labeled precursor substances are administered to a test system, in which they can be introduced into newly synthesized lipids. Well-known analysis methods introduce labeling with radioisotopes (such as  $^3\text{H}$  or  $^{14}\text{C}$ ), stable isotopes ( $^2\text{H}$ ,  $^{13}\text{C}$ ) or fluorescence labels (e.g. fluorescent lipids). Up to now, the lipid metabolism is mostly monitored by methods using radioactive tracer. All these known methods have one or more disadvantages, such as long analysis times in the range of several days, only low to moderate sensitivity or resolution, complex analysis methods or complex sample preparation before analysis. The present innovative click-chemistry-based method allows tracing of fatty acid metabolism in virtually any biological system. It combines high sensitivity with excellent linearity and fast sample turnover. Since it is free of radioactivity, it can be combined with any other modern analysis technology and can be used in high-throughput applications. In an improved and preferred method, multiplexing of samples can be carried out. After the labeling reaction, samples are combined for MS analysis. This increases the sample turnover and improves comparison by reducing stochastic experimental variations. Absolute quantification along with correction for labeling efficiency is achieved by internal standardization, using a set of alkyne-labeled synthetic standard lipids.

### Commercial Opportunities

PROvendis is offering licenses for the invention to interested companies on behalf of the University of Bonn. There is also the possibility of collaboration with the inventor.

### Current Status

In case of interest we are pleased to inform you about the current patent status.

### Relevant Publications

Thiele, C. et al. (2012) Tracing fatty acid metabolism by click chemistry. *ACS Chem. Biol.* 7, 2004-11.

An invention of the University of Bonn.

### Competitive Advantages

- Higher sensitivity as comparable analysis procedures
- Fast detection method for tracing of fatty acid metabolism without usage of radioisotopes
- Hundreds of labelled species detected by automated analysis of primary MS data
- Simple absolute quantification by internal standardization
- Combination of any other analysis method possible
- High stability of bicyclic Triazolium ions leads to predictable fragmentation
- Heavy-atom labelled compounds enable Multiplex analysis

### Technology Readiness Level

12345678

Experimental proof of concept

### Industries

- Diagnostics

### Ref. No.

5364

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