

# Accepted Manuscript

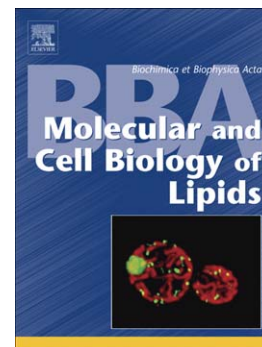
Stable isotope analysis of dynamic lipidomics

Joost Brandsma, Andrew P. Bailey, Grielof Koster, Alex P. Gould, Anthony D. Postle

PII: S1388-1981(17)30042-2  
DOI: doi:[10.1016/j.bbaliip.2017.03.002](https://doi.org/10.1016/j.bbaliip.2017.03.002)  
Reference: BBAMCB 58125

To appear in: *BBA - Molecular and Cell Biology of Lipids*

Received date: 16 December 2016  
Revised date: 7 March 2017  
Accepted date: 9 March 2017



Please cite this article as: Joost Brandsma, Andrew P. Bailey, Grielof Koster, Alex P. Gould, Anthony D. Postle, Stable isotope analysis of dynamic lipidomics, *BBA - Molecular and Cell Biology of Lipids* (2017), doi:[10.1016/j.bbaliip.2017.03.002](https://doi.org/10.1016/j.bbaliip.2017.03.002)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Stable isotope analysis of dynamic lipidomics**

Joost Brandsma<sup>a</sup>, Andrew P. Bailey<sup>b</sup>, Grielof Koster<sup>a,c</sup>, Alex P. Gould<sup>b</sup> and Anthony D. Postle<sup>a</sup>

<sup>a</sup> Academic Unit of Clinical & Experimental Sciences, Faculty of Medicine, University of Southampton, Southampton, United Kingdom

<sup>b</sup> The Francis Crick Institute, 1 Midland Road, London, United Kingdom

<sup>c</sup> National Institute of Health Research Biomedical Research Unit in Respiratory Medicine, University Hospitals NHS Foundation Trust

Corresponding author:

Professor A.D. Postle  
Mailpoint 803, Level F  
South Laboratory and Pathology Block  
Southampton General Hospital  
Tremona Road  
Southampton  
SO16 6YD  
United Kingdom

Tel: +44(0)2381 206161

Email: [adp@soton.ac.uk](mailto:adp@soton.ac.uk)

**Abstract**

Metabolic pathway flux is a fundamental element of biological activity, which can be quantified using a variety of mass spectrometric techniques to monitor incorporation of stable isotope-labelled substrates into metabolic products. This article contrasts developments in electrospray ionisation mass spectrometry (ESI-MS) for the measurement of lipid metabolism with more established gas chromatography mass spectrometry and isotope ratio mass spectrometry methodologies. ESI-MS combined with diagnostic tandem MS/MS scans permits the sensitive and specific analysis of stable isotope-labelled substrates into intact lipid molecular species without the requirement for lipid hydrolysis and derivatisation. Such dynamic lipidomic methodologies using non-toxic stable isotopes can be readily applied to quantify lipid metabolic fluxes in clinical and metabolic studies *in vivo*. However, a significant current limitation is the absence of appropriate software to generate kinetic models of substrate incorporation into multiple products in the time domain. Finally, we discuss the future potential of stable isotope-mass spectrometry imaging to quantify the location as well as the extent of lipid synthesis.

**Keywords**

Dynamic lipidomics; stable isotopes; mass spectrometry; lipid metabolism

Download English Version:

<https://daneshyari.com/en/article/5508472>

Download Persian Version:

<https://daneshyari.com/article/5508472>

[Daneshyari.com](https://daneshyari.com)