



Universiteit
Leiden
The Netherlands

New electromigration-driven enrichment techniques for peptidomics and metabolomics

Lindenburg, P.W.

Citation

Lindenburg, P. W. (2012, June 5). *New electromigration-driven enrichment techniques for peptidomics and metabolomics*. Retrieved from <https://hdl.handle.net/1887/19049>

Version: Corrected Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/19049>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/19049> holds various files of this Leiden University dissertation.

Author: Lindenburg, Petrus Wilhelmus

Title: New electromigration-driven enrichment techniques for peptidomics and metabolomics

Date: 2012-06-05

**New electromigration-driven enrichment techniques
for
peptidomics and metabolomics**

Petrus Wilhelmus Lindenburg

**New electromigration-driven enrichment techniques
for
peptidomics and metabolomics**

PROEFSCHRIFT

Ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
op gezag van Rector Magnificus prof. mr. P.F. van der Heijden
volgens besluit van het College voor Promoties
te verdedigen op dinsdag 5 juni 2012
klokke 15.00 uur

door

Petrus Wilhelmus Lindenburg

geboren te Schiedam in 1979

Promotiecommissie

Promotor: prof. dr. Thomas Hankemeier

Overige leden: prof. dr. M. Danhof
Leiden University, the Netherlands

prof. dr. J. van der Greef
Leiden University, the Netherlands

prof. dr. A. IJzerman
Leiden University, the Netherlands

prof. dr. M.-L. Riekkola
University of Helsinki, Finland

prof. dr. R. Shimmo
Tallinn University, Estonia

Het in dit proefschrift beschreven onderzoek is financieel ondersteund door TNO
(the Systems Biology Program)

Printed and bound by CPI Koninklijke Wöhrmann

ISBN 9789074538787

There is a crack in everything...that's how the light gets in.

Leonard Cohen, 1992

Voor Maartje

Contents

11	Chapter 1 General introduction and scope
33	Chapter 2 Potential of capillary isotachophoresis coupled to mass spectrometry of peptides using spacer molecules
53	Chapter 3 On-line capillary liquid-liquid electroextraction of peptides as fast pre-concentration prior to LC-MS
77	Chapter 4 On-line large-volume capillary electroextraction coupled to LC-MS to improve detection limits of peptides
97	Chapter 5 Feasibility of electroextraction as versatile sample concentrating pretreatment for fast analysis of low abundant urine metabolites and its application to acylcarnitines
117	Chapter 6 Summary, conclusions and perspectives
123	Nederlandse samenvatting
129	Curriculum vitae
131	Publications

