

**Roux-en-Y Gastric Bypass and Calorie Restriction:
Differences and Similarities of Endocrine and Metabolic
Effects in Obesity and Type 2 Diabetes Mellitus**

Mirjam Anne Lips

Roux-en-Y Gastric Bypass and Calorie Restriction: Differences and Similarities of Endocrine and Metabolic Effects in Obesity and Type 2 Diabetes Mellitus

M.A.Lips

ISBN: 978-94-6259-284-1

Cover picture: Sebastian Kaulitzki, SciePro

Layout: Ilse Stronks, persoonlijkproefschrift.nl

Print: Ipskamp Drukkers BV

The research in this thesis was performed at the department of Endocrinology and Metabolism, Leiden University Medical Centre. The study was performed partly within the framework of the Center for Translational Molecular Medicine (<http://www.ctmm.nl>), project PREDICcT (grant 01C-104). The study was performed with an unrestricted grant from the Nederlandse Obesitaskliniek. Financial support was also given by Johnson & Johnson and GI dynamics.

Printing of this thesis was financially supported by the Nederlandse Obesitaskliniek, Applied Medical, Fit for Me, Goodlife, Ipsen, NovoNordisk, Phizer, Sanovi, Chipsoft, Janssen.

© Copyright 2014, M.A.Lips, Amsterdam, the Netherlands

The copyright of the articles that have been published or that have been accepted for publication has been transferred to the respective journals. No part of this thesis may be reproduced or transmitted in any form, by any means, without prior written permission of the author.

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/29021> holds various files of this Leiden University dissertation

Author: Lips, Mirjam Anne

Title: Roux-en-Y gastric bypass and calorie restriction : differences and similarities of endocrine and metabolic effects in obesity and type 2 diabetes mellitus

Issue Date: 2014-10-09

Roux-en-Y Gastric Bypass and Calorie Restriction: Differences and Similarities of Endocrine and Metabolic Effects in Obesity and Type 2 Diabetes Mellitus

Proefschrift

ter verkrijging van

de graad van Doctor aan de Universiteit Leiden,
op gezag van Rector Magnificus prof.mr.C.J.J.M. Stolker,
volgens besluit van het College voor Promoties
te verdedigen op donderdag 9 oktober 2014
klokke 15.00 uur

door

Mirjam Anne Lips

geboren 09-04-1982

te Amsterdam

Promotiecommissie

Promotores:

Prof. Dr. H. Pijl

Prof. Dr. J.A.P. Willems van Dijk

Co-promotor:

Dr. G.H. de Groot (Rode Kruis Ziekenhuis, Beverwijk)

Overige leden:

Prof. Dr. J.W.A. Smit (UMC St. Radboud, Nijmegen)

Prof. Dr. M. Diamant (VU Medisch Centrum, Amsterdam) †

Dr. I.M. Jazet

"After climbing a great hill,
one only finds that there are many more hills to climb."
Nelson Mandela (1918-2013)

CONTENTS

Chapter 1	General introduction and outline of thesis	9
Chapter 2	Calorie restriction is a major determinant of the short-term metabolic effects of gastric bypass surgery in obese type 2 diabetic patients	31
Chapter 3	Roux-en-Y gastric bypass, but not calorie restriction, increases postprandial glucagon release in obese women with or without type 2 diabetes	51
Chapter 4	Calorie restriction and Roux-en-Y gastric bypass have opposing effects on circulating FGF21 in morbidly obese subjects	65
Chapter 5	Roux-en-Y Gastric bypass and calorie restriction induce comparable time dependent effects on thyroid hormone function tests in obese female subjects	85
Chapter 6	Autonomic nervous system activity in diabetic and healthy obese and the effect of distinct weight loss strategies	105
Chapter 7	The effects of Roux-en-Y gastric bypass surgery on the plasma lipidome largely overlap with the effects of calorie restriction	125
Chapter 8	Roux and Y gastric bypass surgery, but not calorie restriction, reduces plasma branched chain amino acids in obese subjects independent of weight loss or the presence of type 2 diabetes mellitus	161
Chapter 9	Resting-state functional connectivity of brain regions involved in cognitive control, motivation and reward is enhanced in obese females	193
Chapter 10	Restrictive and metabolic weight loss strategies in obese females alter functional connectivity network activity in the fasting and postprandial state	217
Chapter 11	Summary and conclusions	235
Chapter 12	Nederlandse samenvatting	251
Chapter 13	List of publications	265
	Curriculum Vitae	269

