



Universiteit  
Leiden  
The Netherlands

## **Insulin and cellular stress induced glucose uptake in 3T3-L1 adipocytes**

Bazuine, M.

### **Citation**

Bazuine, M. (2005, March 10). *Insulin and cellular stress induced glucose uptake in 3T3-L1 adipocytes*. Retrieved from <https://hdl.handle.net/1887/2709>

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/1887/2709>

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

**Insulin and cellular stress induced glucose uptake  
in 3T3-L1 adipocytes**

**Cover photograph :**

Crossing Flatfjellet, photograph taken in Rondane, Norway  
–20<sup>th</sup> March 2002 (Fjell Tours).

In the human species the efficiency of metabolic signalling pathways has evolved such that they enable us to endure sustained moderate physical action in metabolically quite challenging environments with remarkable ease.

# Insulin and cellular stress induced glucose uptake in 3T3-L1 adipocytes

Proefschrift

ter verkrijging van

de graad van Doctor aan de Universiteit Leiden,

op gezag van de Rector Magnificus Dr. D.D. Breimer,

hoogleraar in de faculteit der Wiskunde en

Natuurwetenschappen en die der Geneeskunde,

volgens besluit van het College voor Promoties

te verdedigen op Donderdag 10 Maart 2005

klokke 14:15 uur

door

Merlijn Bazuine

geboren te Linschoten

in 1973

**Promotiecommissie**

Promotor : Prof. Dr. J.A. Maassen

Referent : Prof. Dr. B.T.M. Burgering, University Medical Centre Utrecht

Overige leden : Prof. Dr. R.C. Hoeben

Prof. Dr. J.A. Romijn

Prof. Dr. L.M. Havekes

Dr. C.J. Tack, University Medical Centre Nijmegen

Prof. Dr. S.W. Cushman, National Institutes of Health, Bethesda, USA

Prof. Dr. A.R. Saltiel, University of Michigan, Ann Arbor, USA

The studies described in this thesis were performed at the department of Molecular Cell Biology, Sylvius Laboratories, Leiden University Medical Center.

This research has been made possible by a grant of the Dutch Diabetes Foundation (DFN 98.106).

The financial support of the Dutch Diabetes Foundation in printing this thesis is gratefully acknowledged.

Aan Kiki Jasmijn Bazuine,  
want de toekomst is aan de jeugd.  
Aan Karel Anton Bazuine,  
want wat de jeugd vermag, is wat de grijsaard weet.



Some men dream of things as they are,  
and say why.  
I dream of things that never were,  
and say why not ?

- Bobby Kennedy





## Contents

- Chapter I Insulin-induced signal transduction pathways in 3T3-L1 adipocytes
- Chapter II An introduction to 3T3-L1 adipocytes
- Chapter III Arsenite stimulated glucose transport in 3T3-L1 adipocytes involves both Glut4 translocation and p38 MAPK activity
- Chapter IV Rottlerin inhibits multiple steps involved in insulin-induced glucose uptake in 3T3-L1 adipocytes
- Chapter V Genistein inhibits GLUT4-mediated glucose uptake in 3T3-L1 adipocytes independent of effects on tyrosine kinase activity.
- Chapter VI Lentiviral vectors efficiently transduce quiescent mature 3T3-L1 adipocytes
- Chapter VII Mitogen-Activated Protein Kinase (MAPK) Phosphatase-1 and -4 attenuate p38 MAPK during dexamethasone-induced insulin-resistance in 3T3-L1 adipocytes.
- Chapter VIII Inhibition of protein kinase C $\beta_{II}$  increases glucose uptake in 3T3-L1 adipocytes through elevated expression of glucose transporter 1 at the plasma membrane
- Chapter IX Regulation of GLUT-1 mediated glucose uptake by PKC $\lambda$ -PKC $\beta_{II}$  interactions in 3T3-L1 adipocytes.
- Chapter X General Discussion

Summary

Samenvatting

Curriculum vitae

Abbreviations

