InnoSlim™

A clinically validated nutraceutical ingredient for

Weight Management
Diabetic Support
Metabolic Syndrome

Presented by NuLiv Science International
October, 2012

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The Simple Weight Change Model

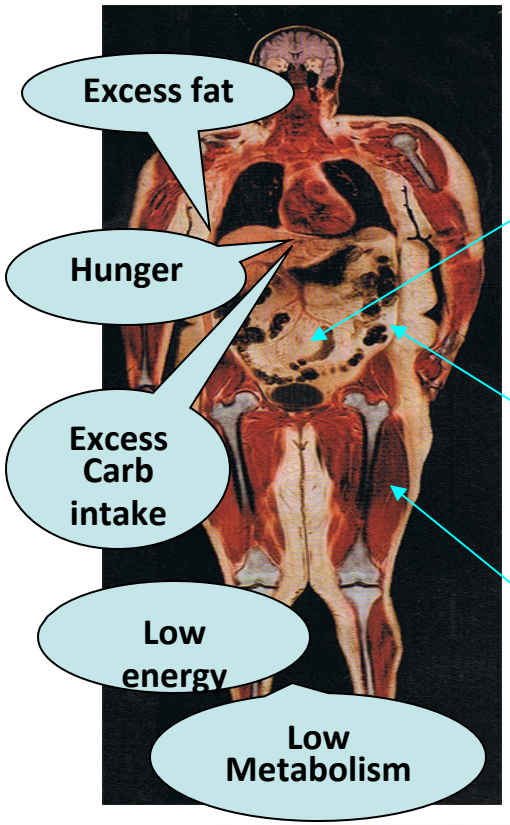
Calorie	Weight
Calorie intake » calorie burned	↑
Calorie intake « calorie burned	↓

The Weight Management Matrix

Balancing Calorie	Problems	InnoSlim™'s Solutions
Eat less calorie	Low energy; low metabolic rate	Increases energy through increasing fat burning
Absorb less calorie	Fiber and laxative also flush out important nutrients	Decreases glucose calorie absorption in intestine
Increase fatty acid/ tissue burning	All thermogenic ingredients contain caffeine and has dangerous side effects	Exerts effects on lipolysis, fat mass and thermogenesis

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InnoSlim™ is a Multi-functioning Natural Weight Management Ingredient



InnoSlim™ reduces glucose calorie absorption in intestine by 48% (slides 5 – 7) and lower blood sugar and insulin resistance (slides 8 - 11)

InnoSlim™ increases fatty acid burning so excess body fat is eliminated and converted to energy (ATP) and body heat. (slices 12 - 20).

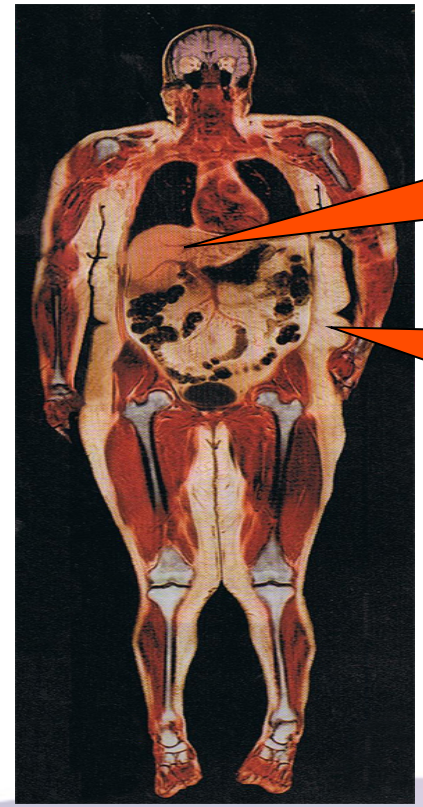
InnoSlim™ increases glucose absorption in muscle and fat cells and glucose calorie burning (slices 21 - 27).



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InnoSlim™ is a Very Effective Ingredient for Weight Management
But will be More Effective when combined with

A nutrition program (high quality protein & low carbohydrate, essential vitamins & minerals) that improves lean body mass and raises metabolic rate, increases diet-induced thermogenesis and prolongs satiety; and fiber(s) that further reduces total calorie intake.



InnoSlim™ Reduces total calorie intake by decreasing glucose calorie absorption in intestine

InnoSlim™ Reduces Excess fat and increases total calorie expenditure by increasing fatty acid oxidation

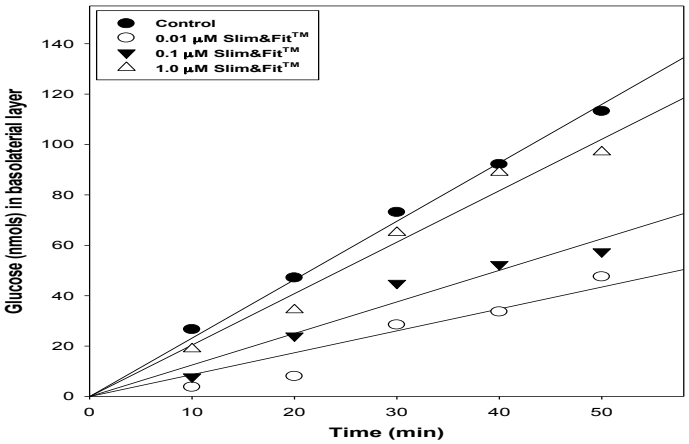
InnoSlim™ Increases energy level by increasing the conversion of glucose to ATP



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InnoSlim™ Decreases Glucose Calorie Absorption in Intestine by 48%

(Groups: Control, InnoSlim™ (0.01, 0.1, and 1 µg)



Group	Dosage	Rate of glucose transport in *Caco-2 cell* monolayers (nmols / min)
Control		2.181 ± 0.058
InnoSlim™	0.01 µg/mL	1.132 ± 0.130*
	0.10 µg/mL	1.276 ± 0.191*
	1.00 µg/mL	2.109 ± 0.210

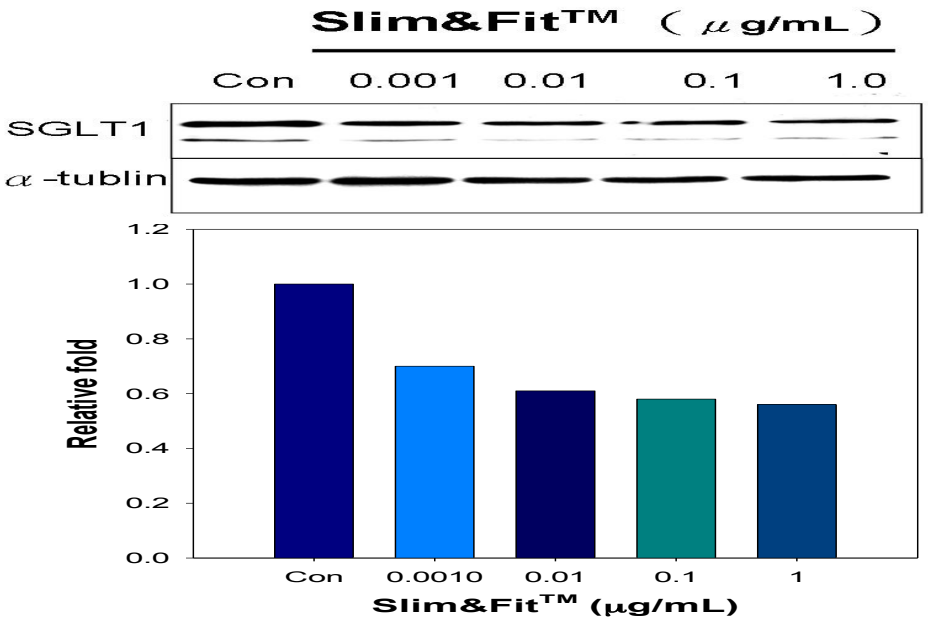
* $p<0.05$, when compared to the control group

The amount of glucose calorie absorbed by the body is regulated by the protein transporter SGLT1 that is in turn regulated by its mRNA level. See studies of SGLT1 protein transporter and mRNA levels in the next 2 slides (slides 5 and 6)

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InnoSlim™ Decreases Glucose Transporter (SGLT1) Level In Intestinal Cells

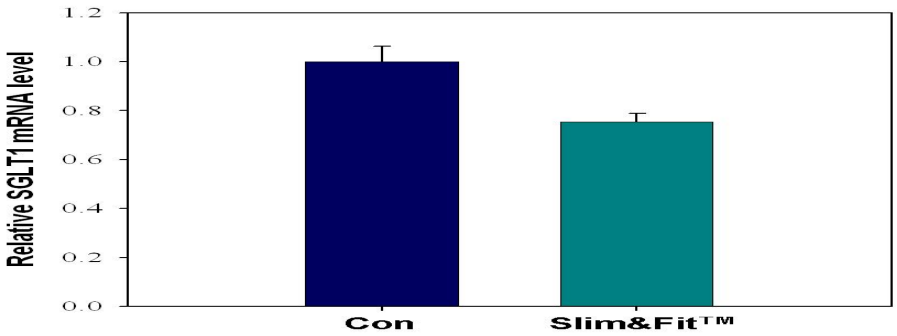
(Groups: Control, InnoSlim™ (0.001, 0.01, 0.1, and 1 µg)



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InnoSlim™ Decreases Glucose Transporter (SGLT1) mRNA Level In Intestinal Cells

(Groups: Control, InnoSlim™)

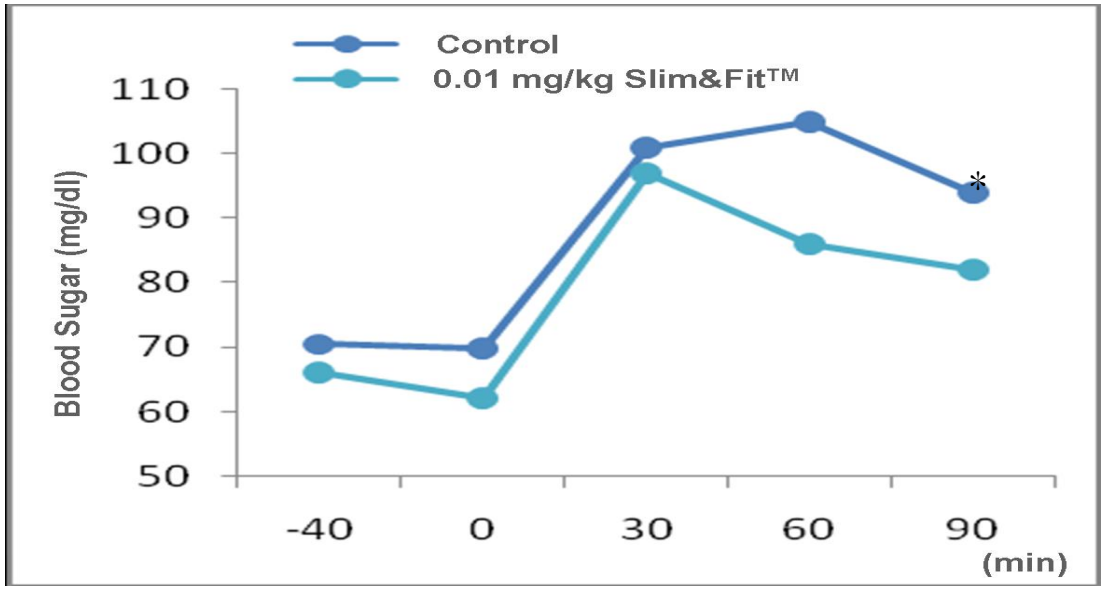


Group	Relative levels of SGLT1 mRNA in Caco-2 cell monolayers
Control	1.00 ± 0.16
InnoSlim™	0.75 ± 0.04*

* $p<0.05$, when compared to the control group

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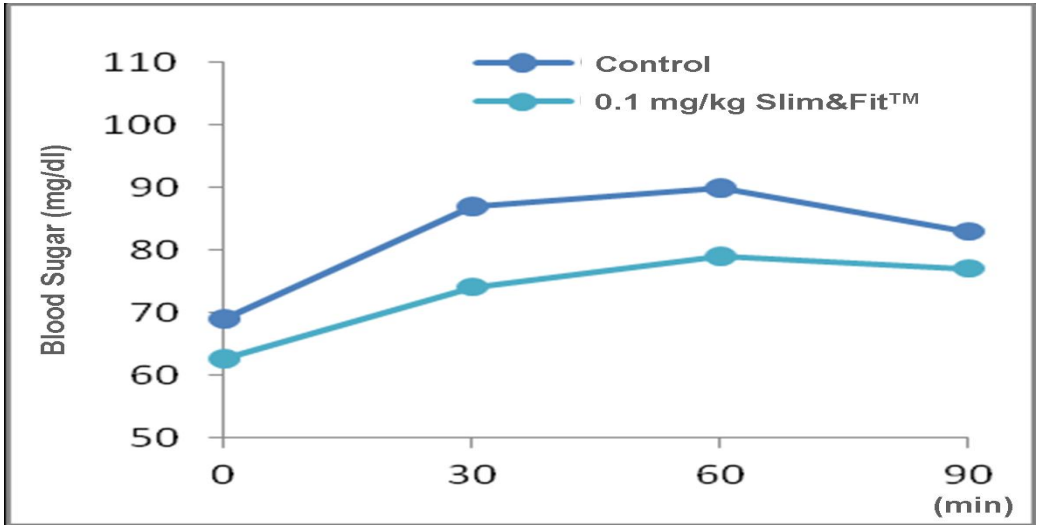
InnoSlim™ Lowers Acute Blood Sugar Level (In vivo)
(Groups: Control, InnoSlim™)



* p<0.05, when compared to the control group

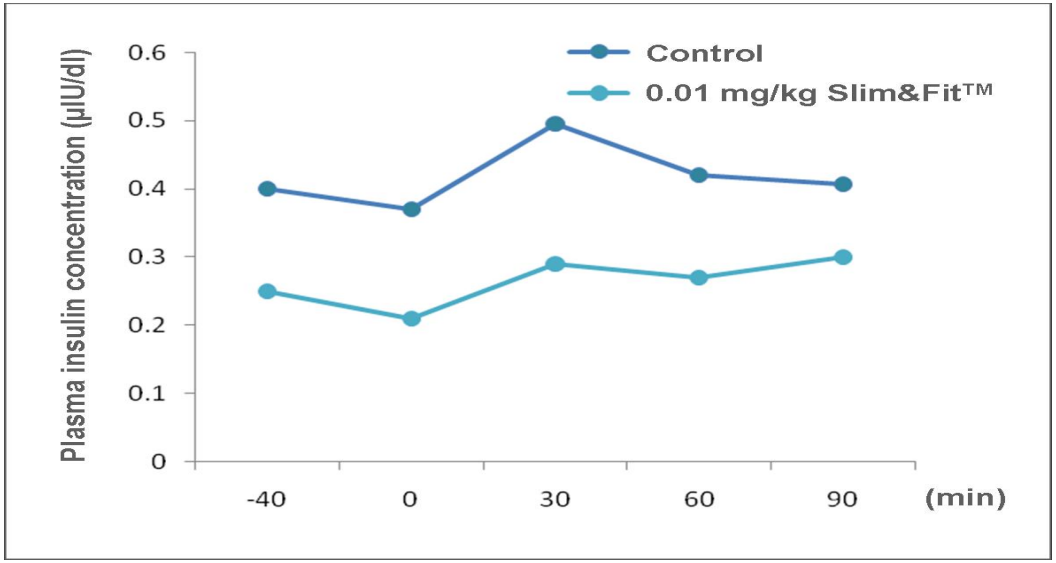
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InnoSlim™ Lowers Chronic Blood Sugar Level (In vivo)
(Groups: Control, InnoSlim™)



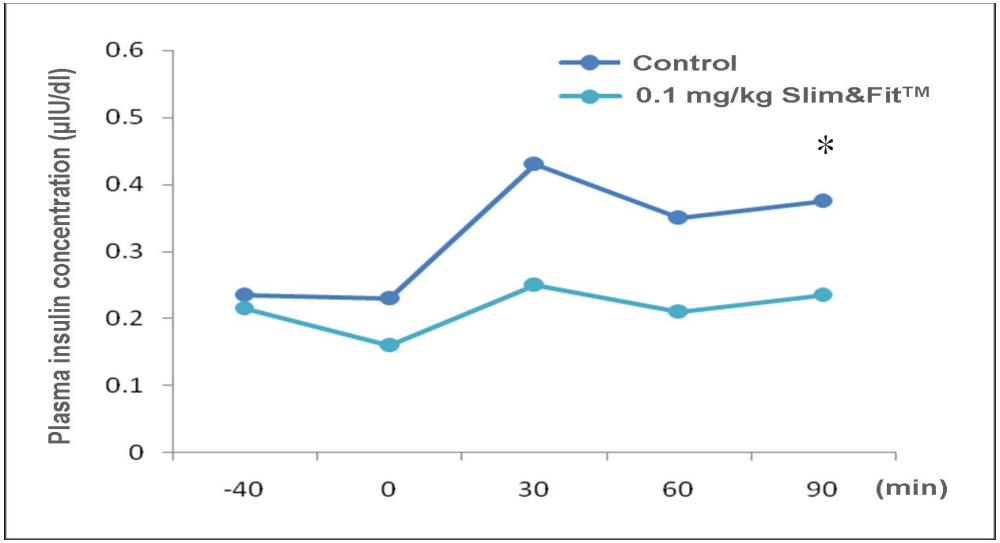
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InnoSlim™ Lowers Acute Insulin Concentration Level (In vivo)
(Groups: Control, InnoSlim™)



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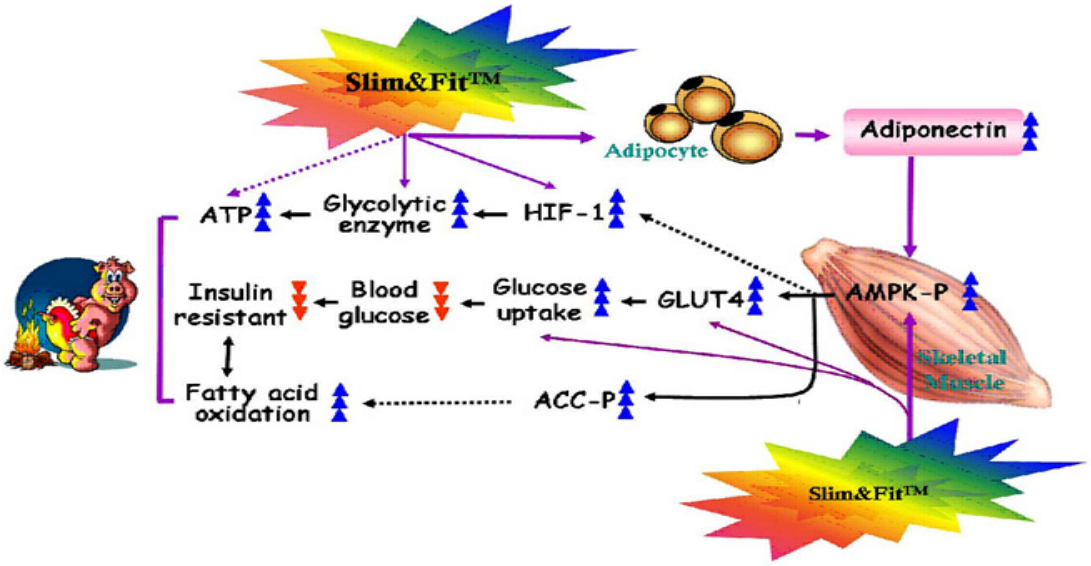
InnoSlim™ Lowers Chronic Insulin Level (In vivo)
(Groups: Control, InnoSlim™)



*** p<0.05, when compared to the control group**

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InnoSlim™ Increases Fat and Glucose Metabolism and Has Many Positive Benefits for Weight and Diabetic Management



ACC-P, GLUT4, and HIF-1 regulates the fat burning (fatty acid oxidation), blood sugar level (glucose absorption in muscle and fat cells), and glucose burning (conversion of glucose to energy (ATP)). Adiponectin activity level affects AMPK, which in turn affects GLUT4, ACC-P, and HIF-1 activity levels. Increasing Adiponectin activity will increase the activities of AMPK, GLUT4, ACC-P, and HIF-1.

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Summary of Studies on InnoSlim™'s Ability to Increase the Activities of Adiponectin, AMPK, ACC, GLUT4, HIF-1, and ATP and consequently the Increases in Fat and Glucose Metabolism

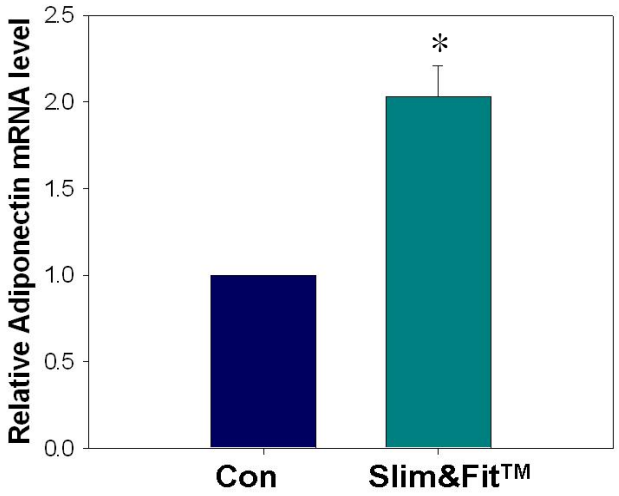
Adiponectin	• mRNA level in fat cells (normal: control, InnoSlim™) (slide 14) • mRNA level in fat cells (IR: control, InnoSlim™) (slide 14) • mRNA level in fat cells (control, IR, InnoSlim™, IR + InnoSlim™) (slide 15)
AMPK	• Protein level in fat cells (control, InnoSlim™) (slide 16) • Protein level in muscle cells (control, InnoSlim™, AICAR, Insulin) (slide 17)
ACC	• Protein level in fat cells (control, InnoSlim™, AICAR) (slide 18) • Protein level in muscle cells (control, InnoSlim™, AICAR) (slide 19) • Protein level in Liver cells (control, InnoSlim™, AICAR, insulin) (slide 20)
GLUT4	• Protein level in fat cells (control, InnoSlim™, AICAR) (slide 21) • mRNA level in fat cells (control, InnoSlim™) (slide 22) • Protein level in muscle cells (control, InnoSlim™, AICAR, insulin) (slide 23) • Glucose absorption in fat cells (preadipocyte, adipocyte, insulin, InnoSlim™) (slide 24) • Glucose absorption in muscle cells (control, insulin, AICAR, InnoSlim™) (slide 25)
HIF-1	• Protein level in muscle cells (control, InnoSlim™, AICAR, insulin) (slide 26)
ATP	• ATP level in liver cells (control, InnoSlim™) (slide 27)

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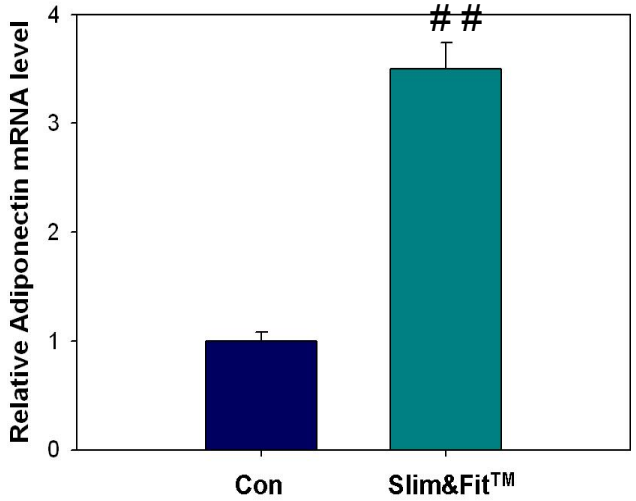
InnoSlim™ Increases Adiponectin mRNA Level In Fat (3T3-L1) Cells

(Groups: Control, InnoSlim™)

Normal



IR (Insulin Resistance)



Group	Relative levels of Adiponectin mRNA in 3T3-L1 adipocytes	
	Normal	IR
Control	1.00±0.0	1.00±0.08
InnoSlim™	2.03±0.18*	3.50±0.24##

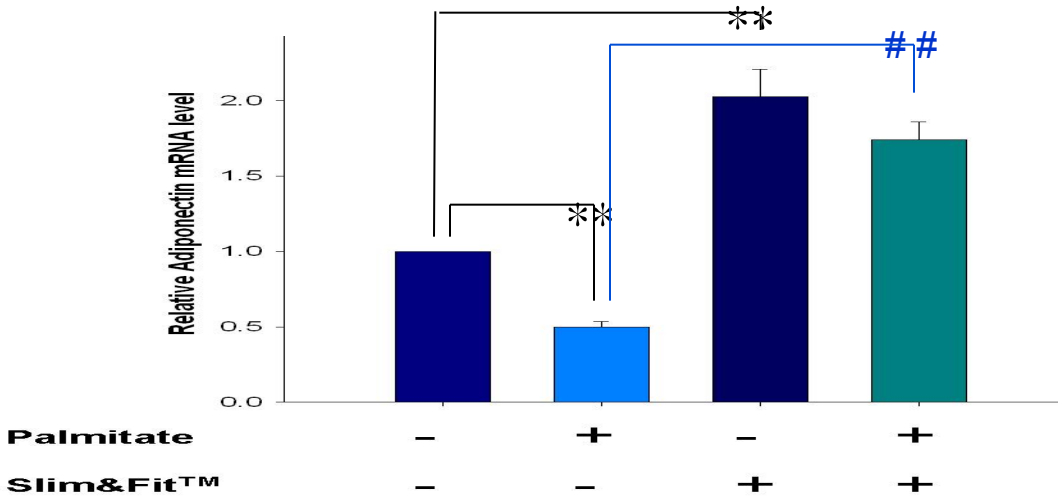
* p<0.05, when compared to the normal control group

p<0.001, when compared to the IR group

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InnoSlim™ Increases Adiponectin mRNA Level In Fat (3T3-L1) Cells

(Groups: Control, IR, InnoSlim™, IR & InnoSlim™)



Group	Relative levels of Adiponectin mRNA in 3T3-L1 adipocytes
Control	1.00±0.0
IR (Palmitate-induced)	0.50±0.04**
InnoSlim™	2.03±0.18 **
InnoSlim™ under IR model	1.74±0.12##

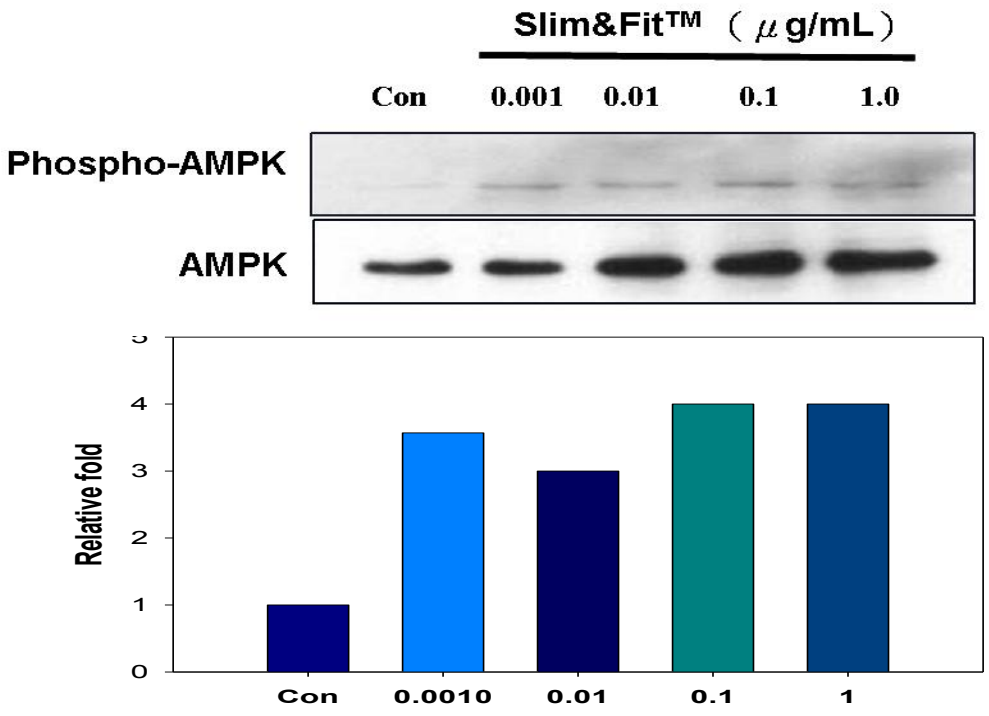
** p<0.01, when compared to the normal control group

p<0.01, when compared to the IR group

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InnoSlim™ Increases AMPK Transporter Level In Fat (3T3-L1) Cells

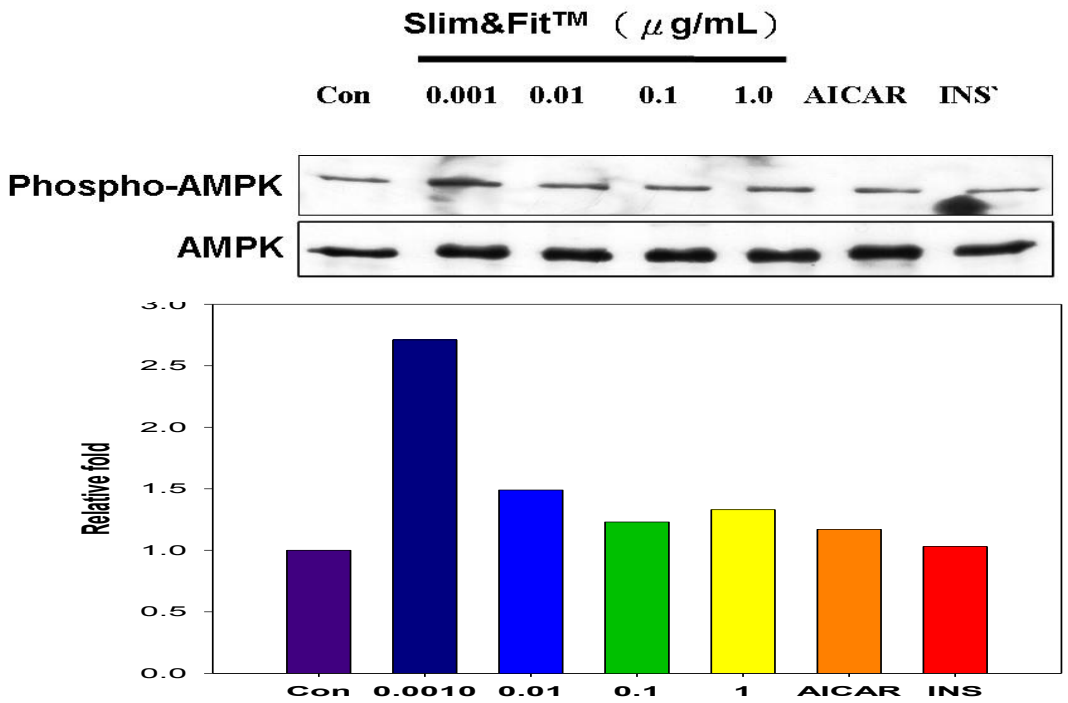
(Groups: Control, InnoSlim™ 0.001, 0.01, 0.1, and 1.0 µg))



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InnoSlim™ Increases AMPK Transporter Level In Muscle (HSMMT) Cells

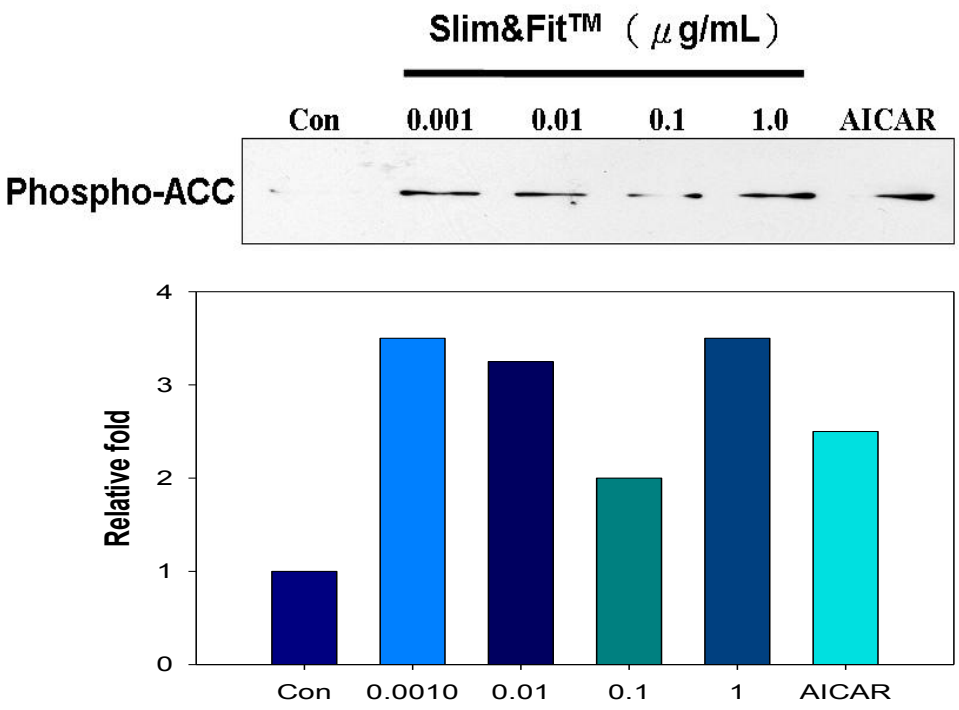
(Groups: Control, InnoSlim™ (0.001, 0.01, 0.1, and 1 μg), AICAR, Insulin)



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InnoSlim™ Increases ACC Transporter Level In Fat (3T3-L1) Cells

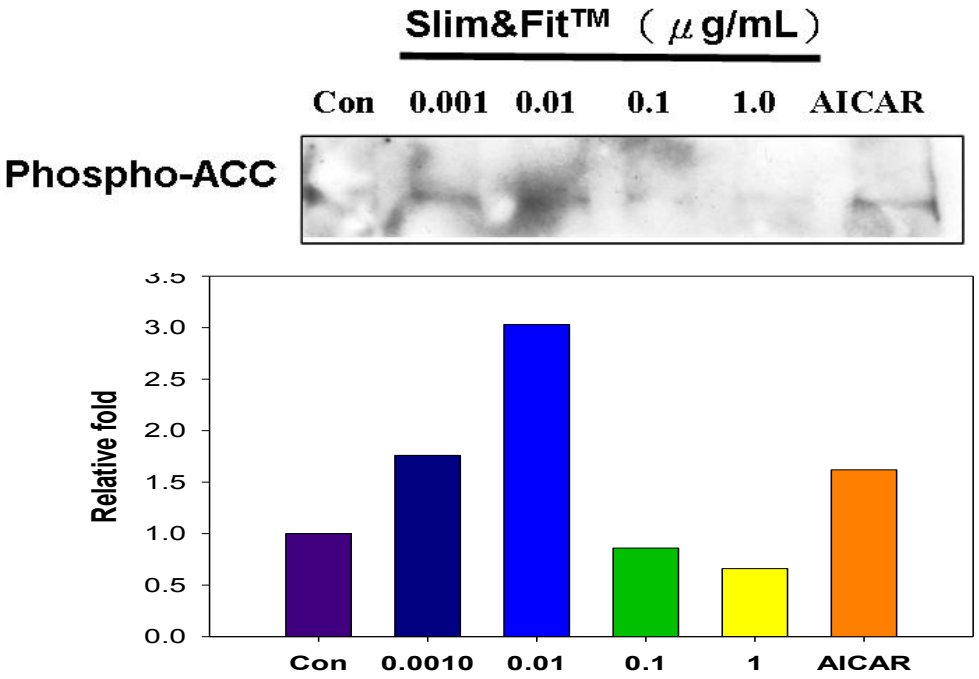
(Groups: Control, InnoSlim™ (0.001, 0.01, 0.1, and 1 µg), AICAR)



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InnoSlim™ Increases ACC Transporter Level In Muscle (HSMMT) Cells

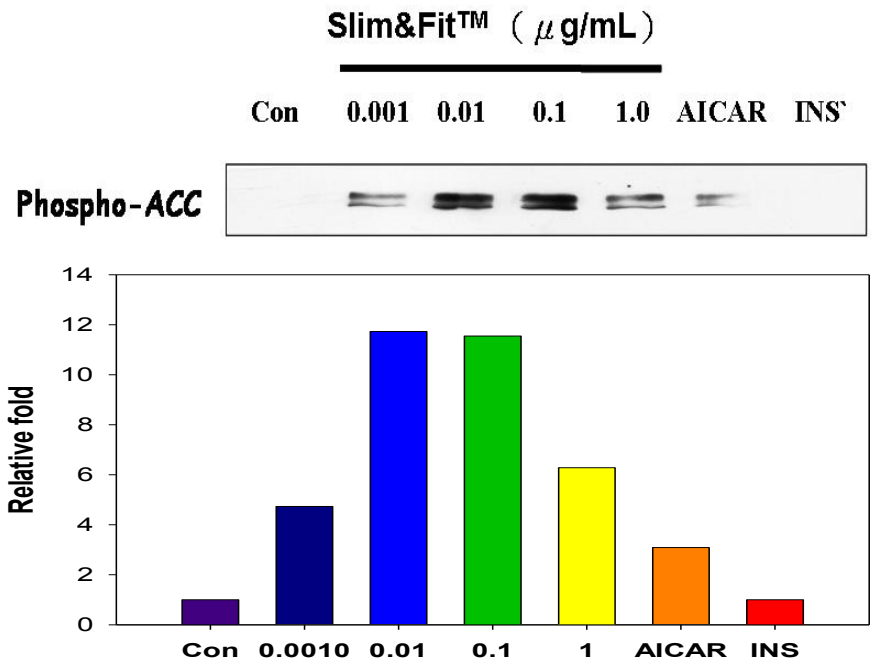
(Groups: Control, InnoSlim™(0.001, 0.01, 0.1, and 1 μg), AICAR)



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InnoSlim™ Increases ACC Transporter Level In Liver (HepG2) Cells

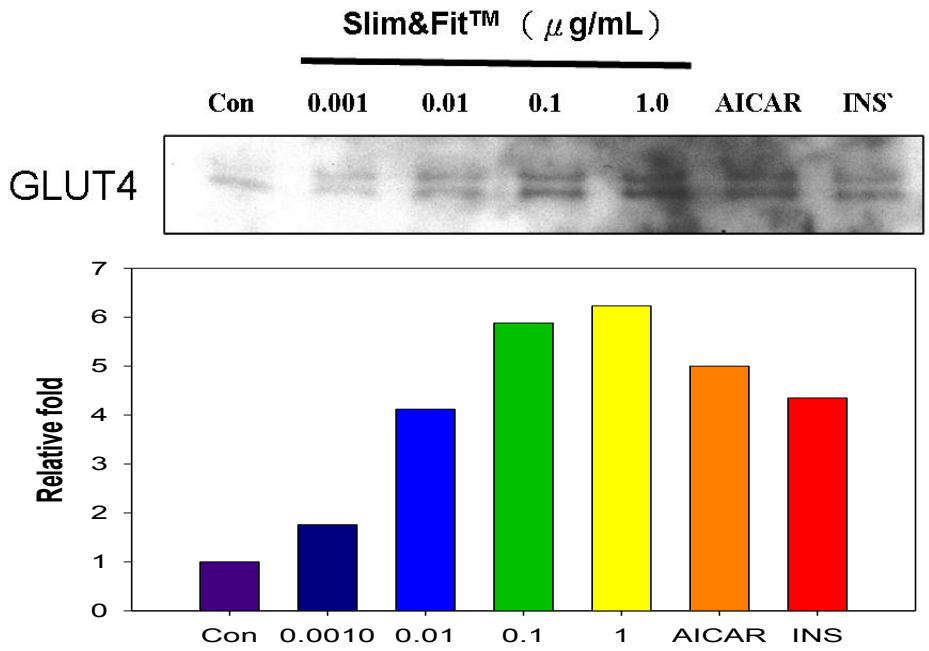
(Groups: Control, InnoSlim™ (0.001, 0.01, 0.1, and 1 μg), AICAR, Insulin)



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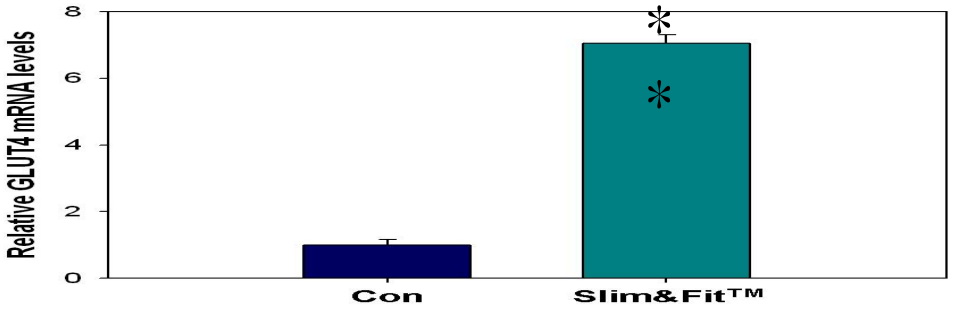
InnoSlim™ Increases GLUT4 Transporter Level In Fat (3T3-L1) Cells

(Groups: Control, InnoSlim™ (0.001, 0.01, 0.1, and 1 µg), AICAR)



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InnoSlim™ Increases GLUT4 mRNA Level In Fat (3T3-L1) Cells
(Groups: Control, InnoSlim™)



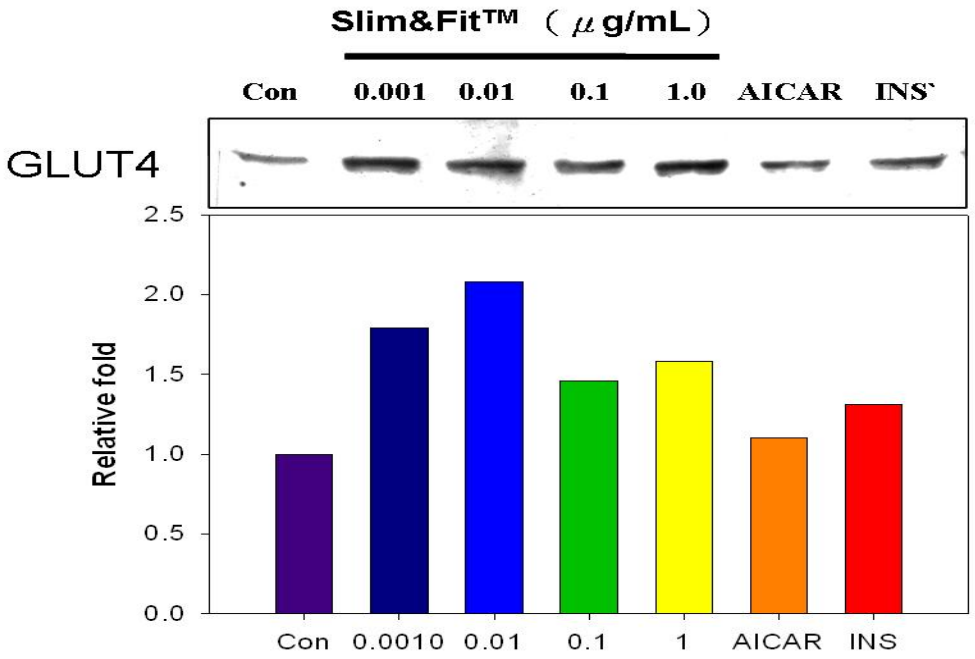
Group	Relative levels of GLUT4 mRNA in 3T3-L1 adipocytes
Control	1.00 ± 0.16
InnoSlim™	7.05 ± 0.25

** p<0.01, when compared to the control group

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InnoSlim™ Increases GLUT4 Transporter Level in Muscle (HSMMT) Cells

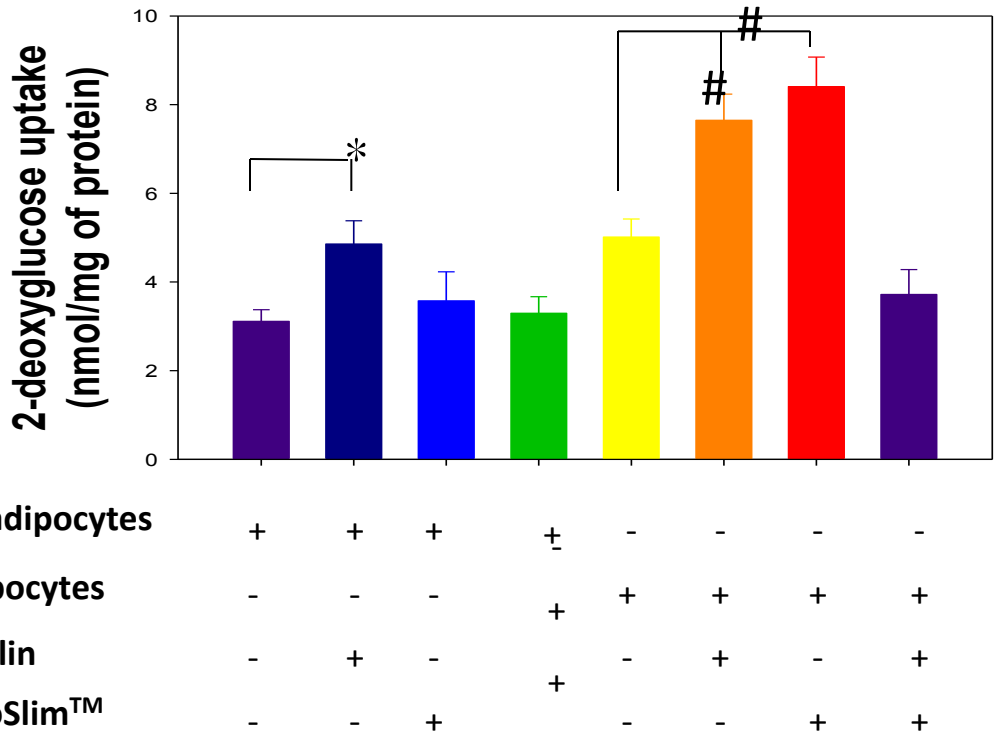
(Groups: Control, InnoSlim™ (0.01, 0.01, 0.1, 1 μg), AICAR, Insulin)



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InnoSlim™ Increases Glucose Absorption In Fat (3T3-L1) Cells

(Groups: Preadipocytes, Adipocytes, Insulin, InnoSlim™)



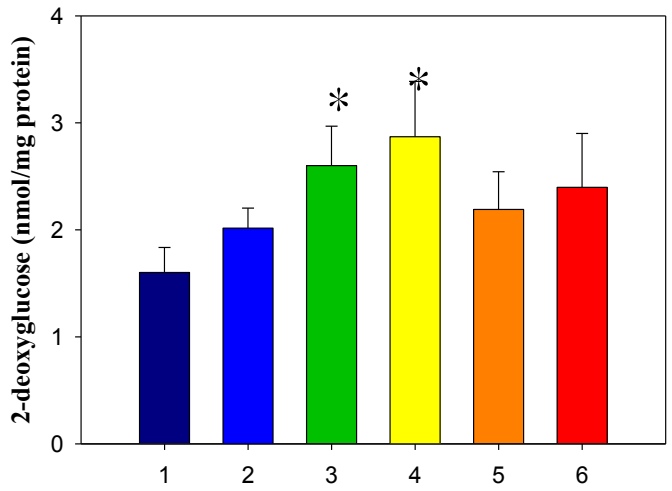
* p<0.05, when compared to the preadipocytes control group

# p<0.05, when compared to the adipocytes control group

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InnoSlim™ Increases Glucose Absorption in Muscle (HSMMT) Cells

(Groups: Control, Insulin, AICAR, InnoSlim™ (0.001, 0.01, and 0.1 µg))



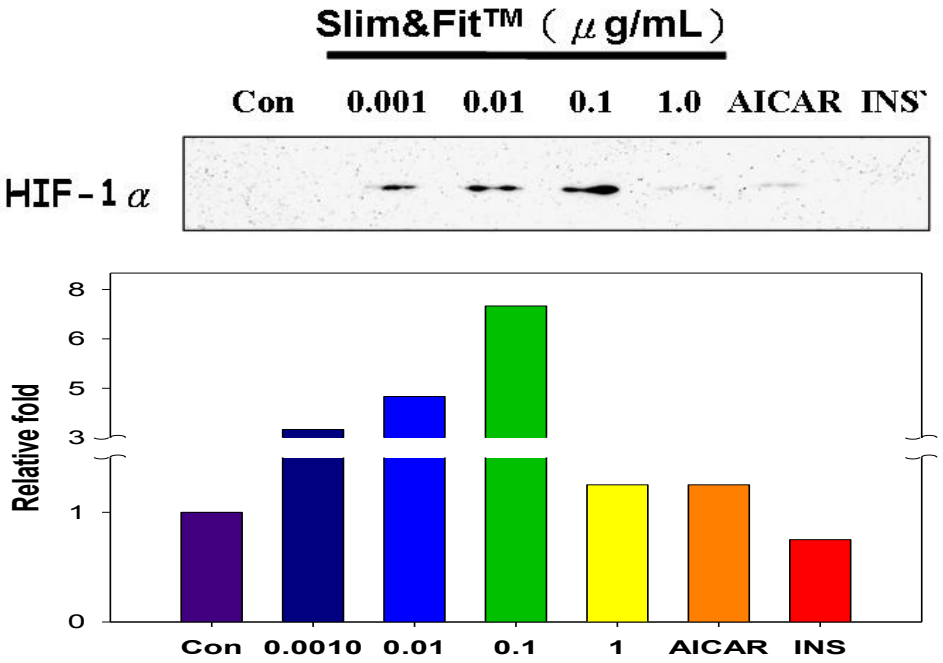
Group	2-deoxyglucose (nmol/mg protein)
1 Control	1.601 ± 0.234
2 Insulin	2.016 ± 0.187
3 AICAR	2.601 ± 0.368*
4 0.001 µg/mL InnoSlim™	2.871 ± 0.517*
5 0.01 µg/mL InnoSlim™	2.191 ± 0.352
6 0.1 µg/mL InnoSlim™	2.397 ± 0.504

* p<0.05, when compared to the control group

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InnoSlim™ Increases HIF-1 Transporter Level In Muscle (HSMMT) Cells

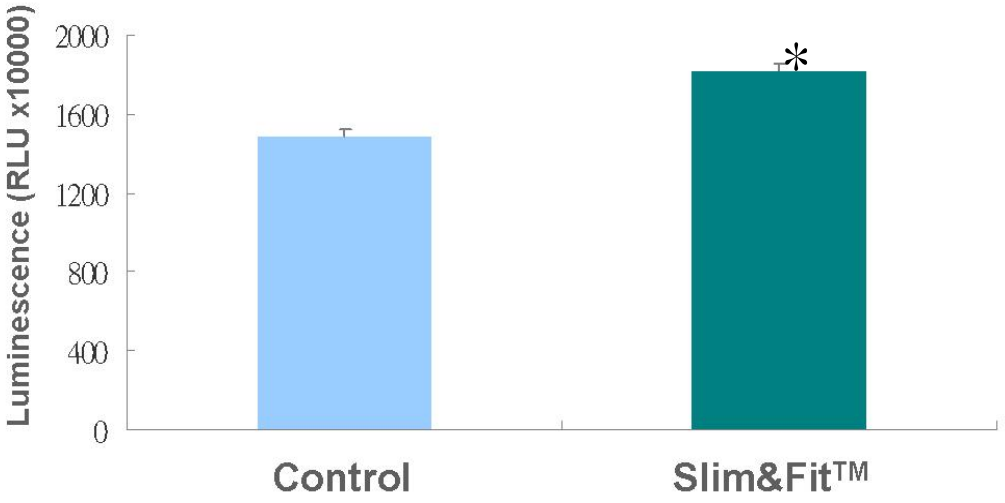
(Groups: Control, InnoSlim™ (.001, 0.01, 0.1, and 1 μg), AICAR, Insulin)



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InnoSlim™ Increases ATP Level In Liver (HepG2) Cells

(Groups: control, InnoSlim™)



*p<0.05, when compared to the control group

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InnoSlim™ Provides Effective Diabetic Support

Decreases blood sugar level by decreasing glucose transporter SGLT1 activity so less glucose is transported into the intestinal cells (slides 5 -9)

Reduce inflammatory Biomarkers RPB4, PAI-1, and TNFα to reduce diabetic related negative effects to body (slides 30 – 35)



Reduce insulin resistance by reducing blood sugar level in blood stream (slides 10 – 11)

Decreases blood sugar level by increasing glucose transporter GLUT4 activity so more glucose is transported into the muscle and fat cells (slides 21 – 25)

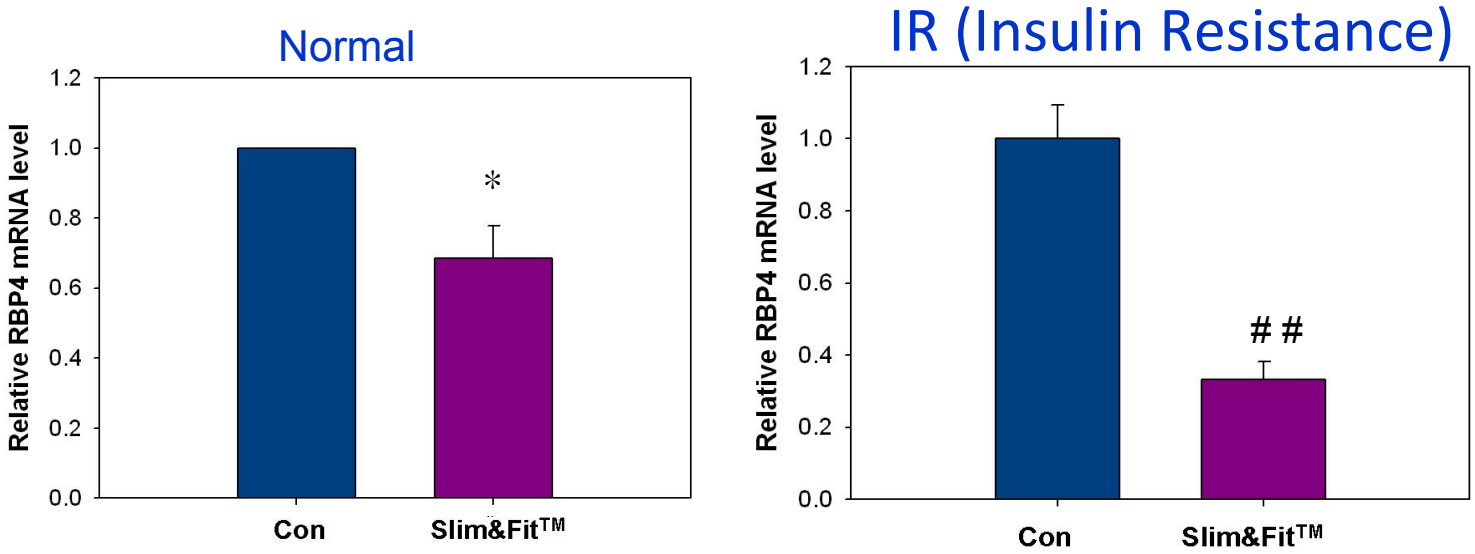
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InnoSlim™ Decreases the Activities of Inflammatory Biomarkers to Support Many Diabetes' Induced Health Problems

RBP4	• mRNA level in fat cells (normal: control, InnoSlim™) (slide 30) • mRNA level in fat cells (IR: control, InnoSlim™) (slide 30) • mRNA level in fat cells (control, IR, InnoSlim™, InnoSlim™ + IR) (slide 31)
PAI-1	• mRNA level in fat cells (normal: control, InnoSlim™) (slide 32) • mRNA level in fat cells (IR: control, InnoSlim™) (slide 32) • mRNA level in fat cells (control, IR, InnoSlim™, InnoSlim™ + IR) (slide 33)
TNFα	• mRNA level in fat cells (normal: control, InnoSlim™) (slide 34) • mRNA level in fat cells (IR: control, InnoSlim™) (slide 34) • mRNA level in fat cells (control, IR, InnoSlim™, InnoSlim™ + IR) (slide 35)

InnoSlim™ Decreases RBP4 mRNA Level In Fat (3T3-L1) Cells

(Normal & IR: control, InnoSlim™)



Group	Relative levels of RBP4 mRNA in 3T3-L1 adipocytes	
	Normal	IR
Control	1.00±0.01	1.00±0.09
InnoSlim™	0.69±0.09*	0.33±0.05##

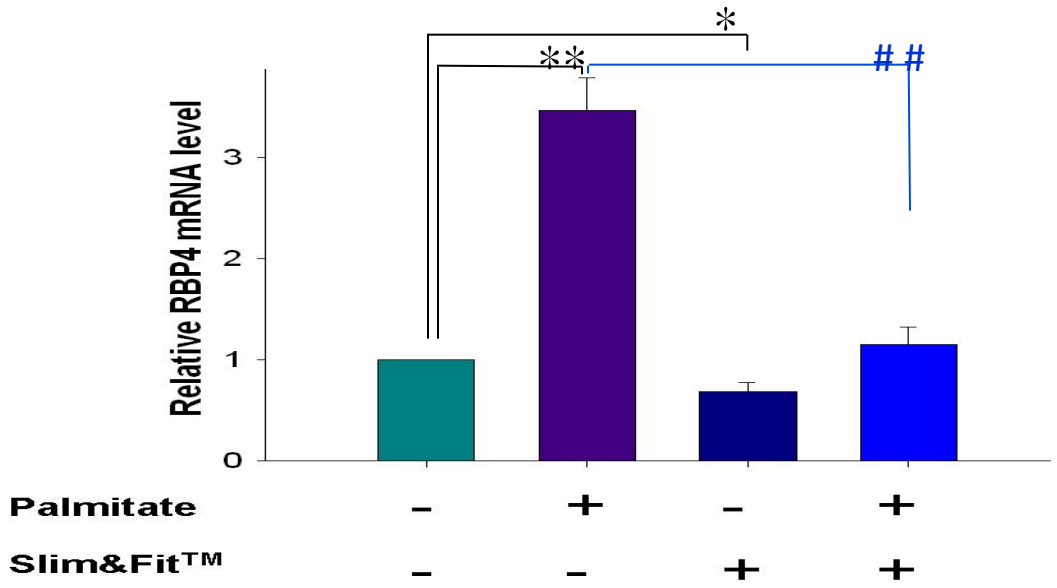
* p<0.05, when compared to the normal control group

p<0.01, when compared to the IR group

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InnoSlim™ Decreases RBP4 mRNA Level In Fat (3T3-L1) Cells

(Groups: control, IR, InnoSlim™, InnoSlim™ + IR)



Group	Relative levels of RBP-4 mRNA in 3T3-L1 adipocytes
Control	1.00±0.01
IR (Palmitate-induced)	3.47±0.32**
InnoSlim™	0.69±0.09*
InnoSlim™ under IR model	1.15±0.17##

* * p<0.01, when compared to the normal control group

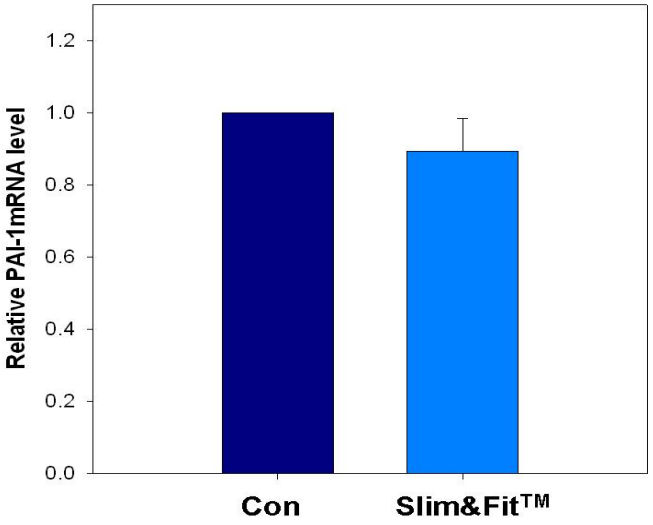
p<0.01, when compared to the IR group

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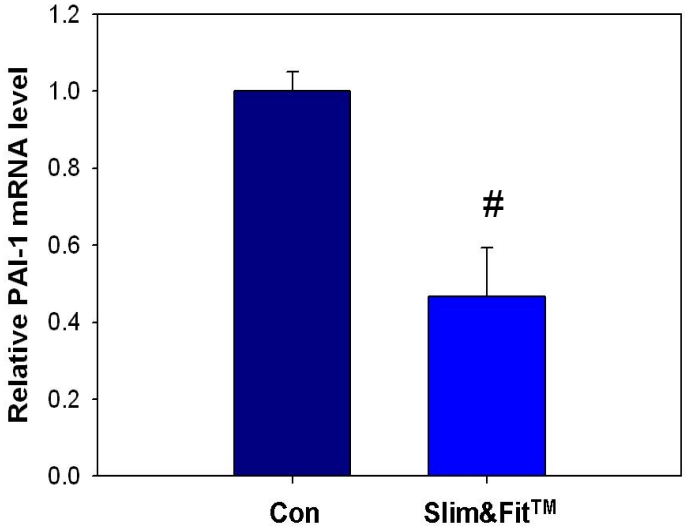
InnoSlim™ Decreases PAI-1 mRNA Level In Fat (3T3-L1) Cells

(Normal & IR: control, InnoSlim™)

Normal



IR (Insulin Resistance)



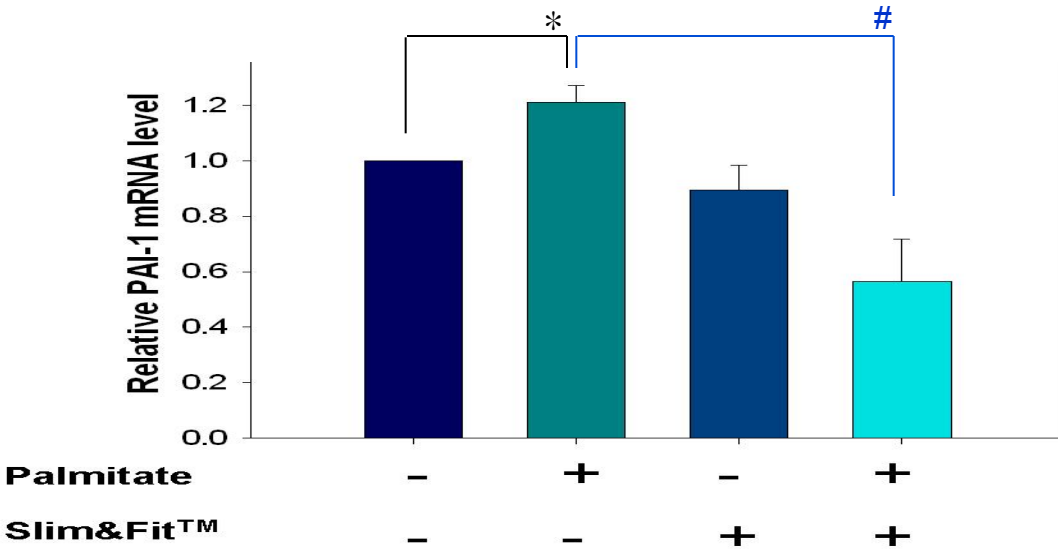
Group	Relative levels of PAI-1 mRNA in 3T3-L1 adipocytes	
	Normal	IR
Control	1.00±0.01	1.00±0.05
InnoSlim™	0.89±0.09	0.47±0.13#

# p<0.05, when compared to the IR group

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InnoSlim™ Decreases PAI-1 mRNA Level In Fat (3T3-L1) Cells

(Groups: control, IR, InnoSlim™, InnoSlim™ + IR)



Group	Relative levels of PAI-1 mRNA in 3T3-L1 adipocytes
Control	1.00±0.01
IR (Palmitate-induced)	1.21±0.06*
InnoSlim™	0.89±0.09
InnoSlim™ under IR model	0.57±0.15#

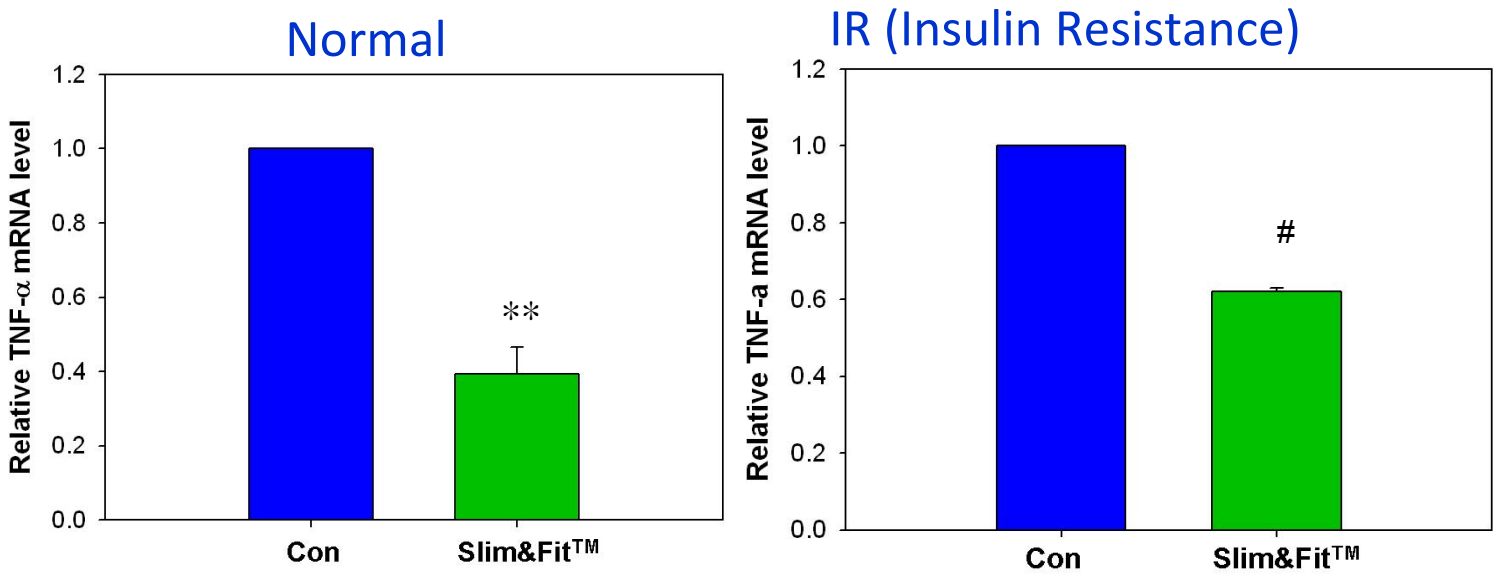
* p<0.05, when compared to the normal control group

\# p<0.05, when compared to the IR group

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InnoSlim™ Decreases TNFα mRNA Level In Fat (3T3-L1) Cells

(Normal & IR: control, InnoSlim™)



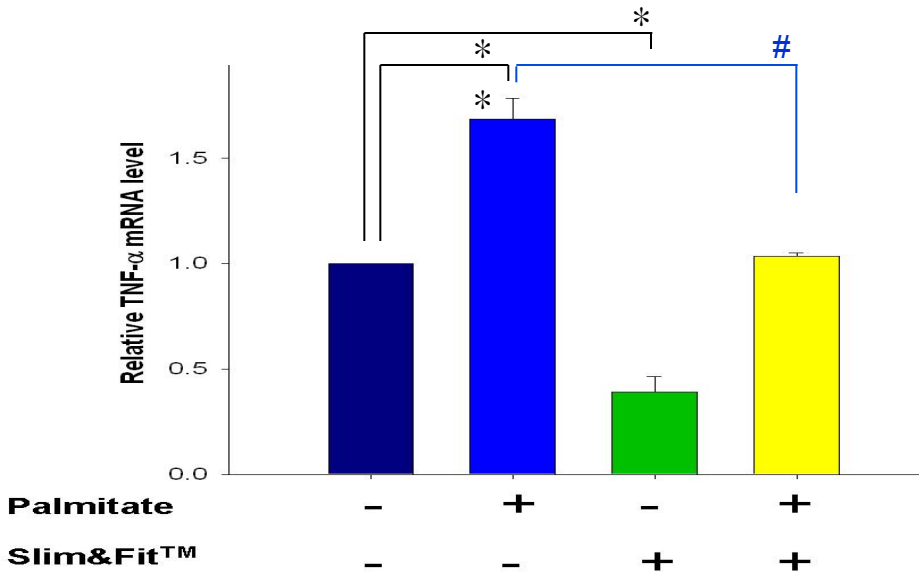
Group	Relative levels of TNF-α mRNA in 3T3-L1 adipocytes	
	Normal	IR
Control	1.00±0.01	1.00±0.0
InnoSlim™	0.39±0.07**	0.62±0.01#

** p<0.01, when compared to the normal control group

# p<0.05, when compared to the IR group

NuLivScience nutraceutical solutions

InnoSlim™ Decreases TNFα mRNA Level In Fat (3T3-L1) Cells
(Groups: control, IR, InnoSlim™, InnoSlim™ + IR)



Group	Relative levels of TNF-α mRNA in 3T3-L1 adipocytes
Control	1.00±0.01
IR (Palmitate-induced)	1.68±0.10**
InnoSlim™	0.39±0.07*
InnoSlim™ under IR model	1.04±0.02#

* p<0.05, when compared to the normal control group
** p<0.01, when compared to the normal control group
# p<0.05, when compared to the IR group

NuLivScience nutraceutical solutions

NuLiv's studies in cells, animals, and humans conclusively suggested that InnoSlim™ is a breakthrough and revolutionary new nutraceutical ingredient that is safe and effective for

Weight Management
Diabetic Support
Metabolic Syndrome

Thank You

NuLivScience
nutraceutical solutions