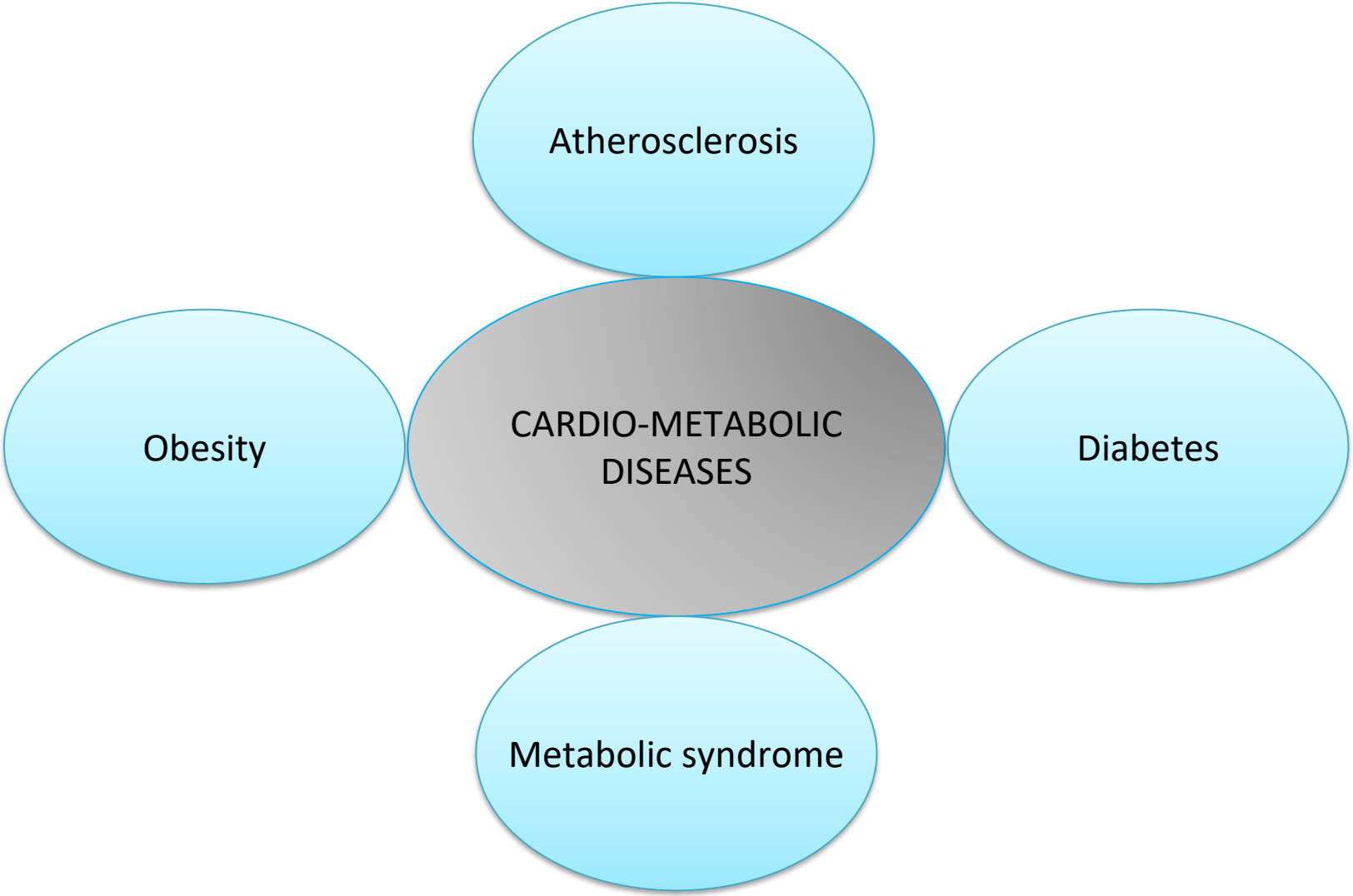
MOLECULAR AND FUNCTIONAL CHARACTERIZATION OF HUMAN SW 872 ADIPOCYTES AS A MODEL SYSTEM FOR TESTING NUTRACEUTICAL PRODUCTS

Chiara Olivieri, Marco Ruzza, Fationa Tolaj, Lorenzo DaDalt and Paolo Magni


Atherosclerosis
Obesity
CARDIO-METABOLIC DISEASES
Diabetes
Metabolic syndrome

CELL MODELS FOR *IN VITRO* STUDIES OF ADIPOSE TISSUE

MURINE CELL MODELS

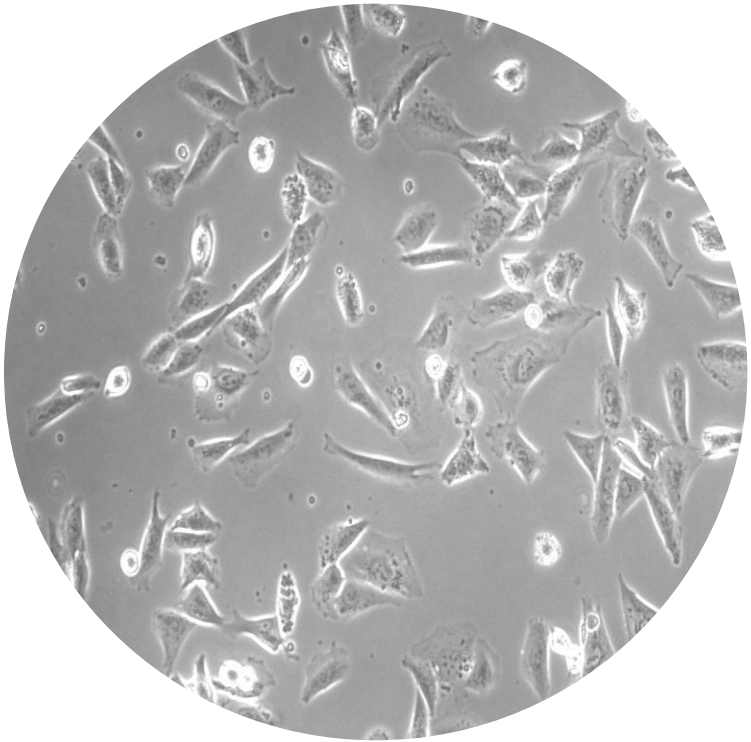
- 3T3- L1
- 3T3-F442A
- CH3H10T1/2
- OP9
- Mouse embryonic fibroblast (MEF)

HUMAN CELL MODELS

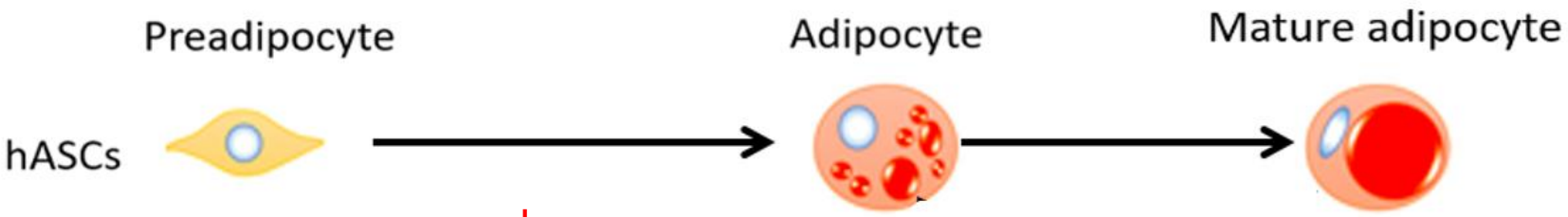
- Adipose tissue derived stem cells (ASC)
- Primary preadipocytes
- Cell lines derived from human tumors

HUMAN LIPOSARCOMA SW 872 CELL LINE

- DERIVED FROM A HUMAN LIPOSARCOMA
- PREADIPOCYTE PHENOTYPE
- FIBROBLASTIC MORPHOLOGY
- MONOLAYER
- DMEM-F12 +10% FBS



SW 872: DIFFERENTIATION IN MATURE ADIPOCYTES



Early differentiation with cocktail

IBMX → CREB → C/EBPβ

DEX → C/EBPδ

INSULIN → SREBP1c

Later differentiation with 100 µM oleic acid (7 days)

OLEIC ACID → PPARγ ⇄ C/EBPα

AIM OF THE STUDY

CHARACTERIZATION OF HUMAN SW 872 CELLS

TRIGLYCERIDE ACCUMULATION

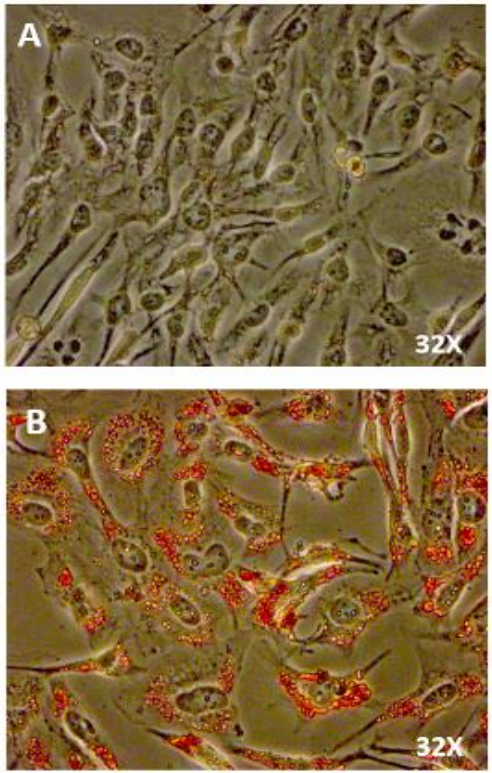
GLUCOSE UPTAKE & pAkt MODULATION

PROINFLAMMATORY CYTOKINE RELEASE

PHYTOCHEMICAL EFFECT EVALUATION

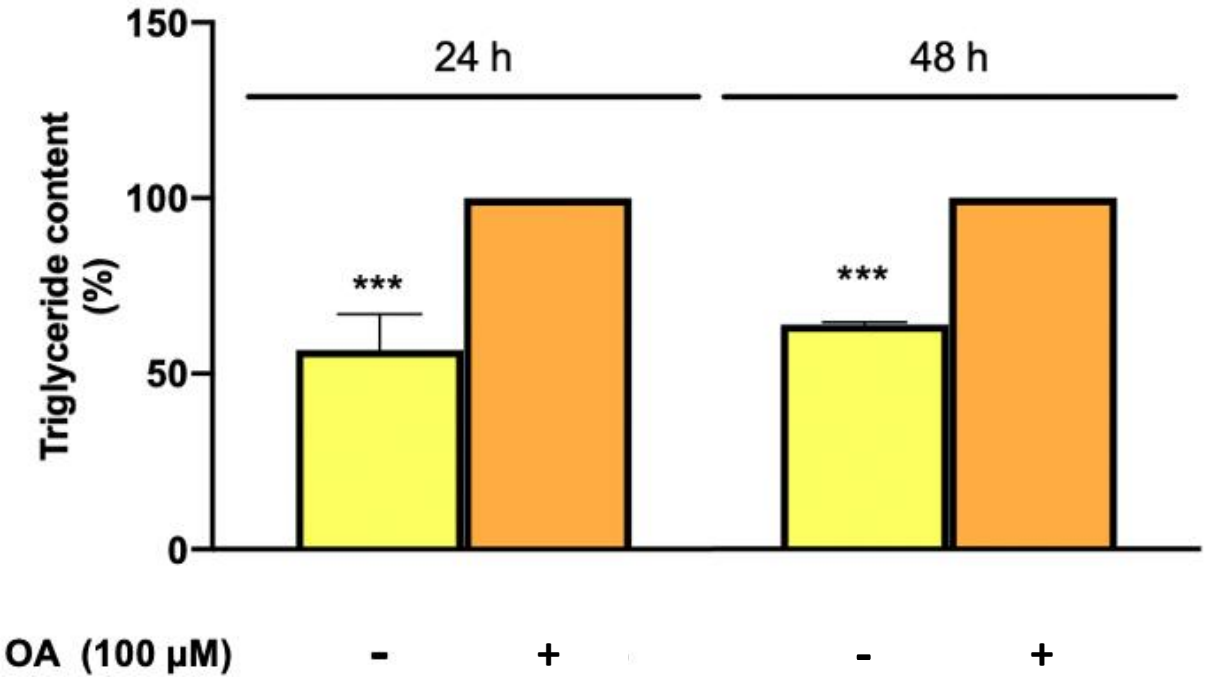
TRIGLYCERIDES ACCUMULATION

OIL-RED-O Analysis



SW 872 non-differentiated (A) and differentiated (B)

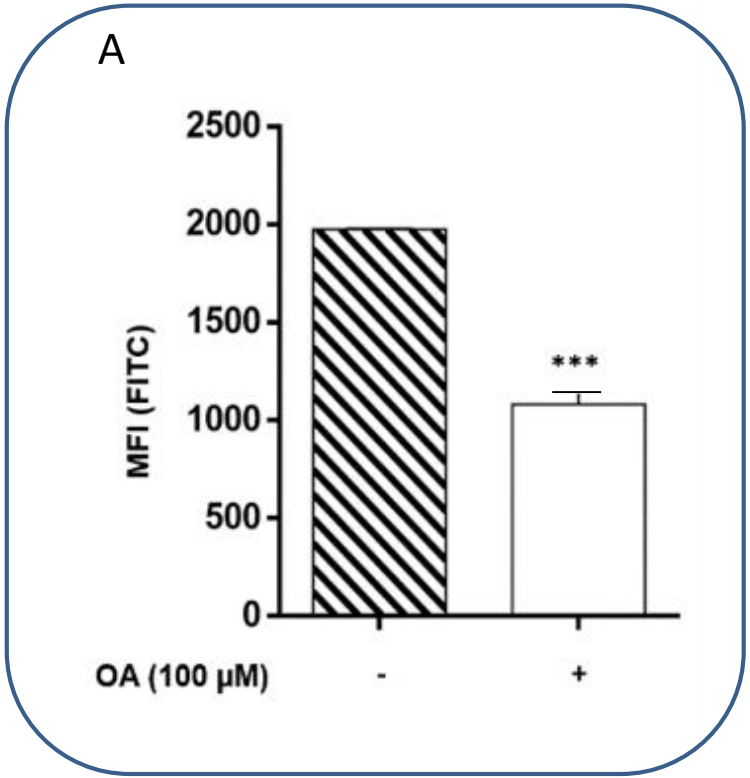
TRIGLYCERIDES QUANTIFICATION



*n=3, mean±SD. ***P<0.001 (one-way ANOVA multiple comparison)*

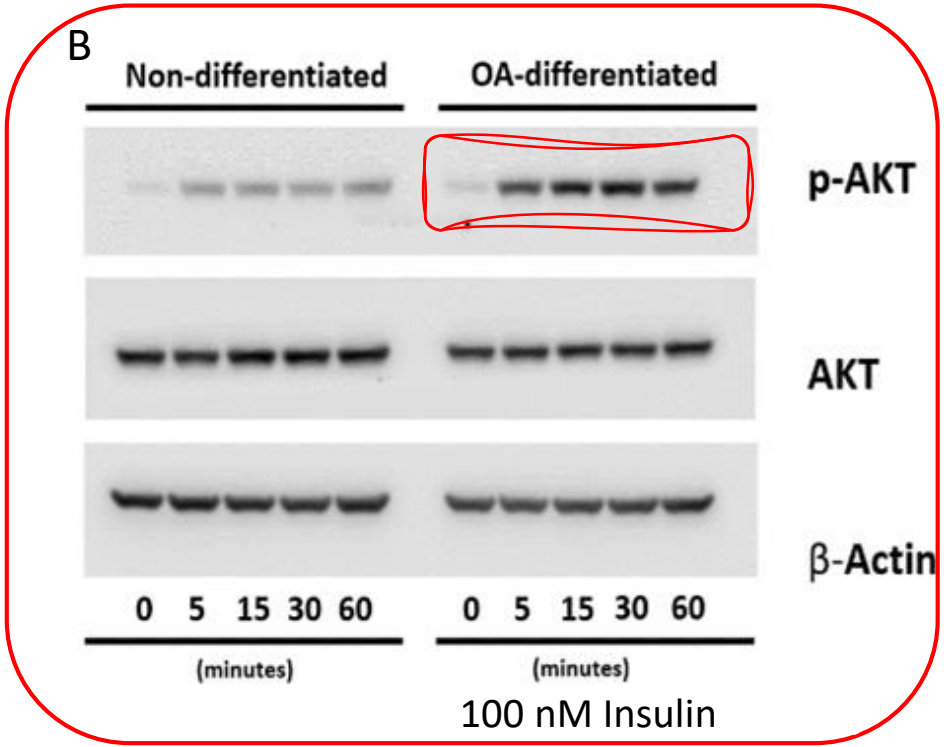
GLUCOSE UPTAKE

(FACS)



pAkt MODULATION

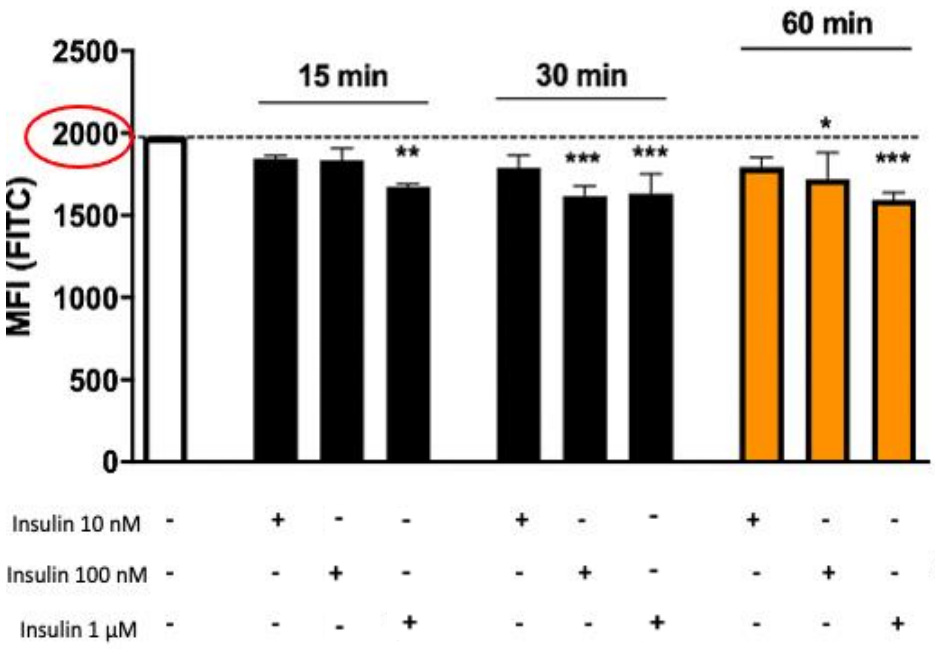
(WESTERN BLOT)



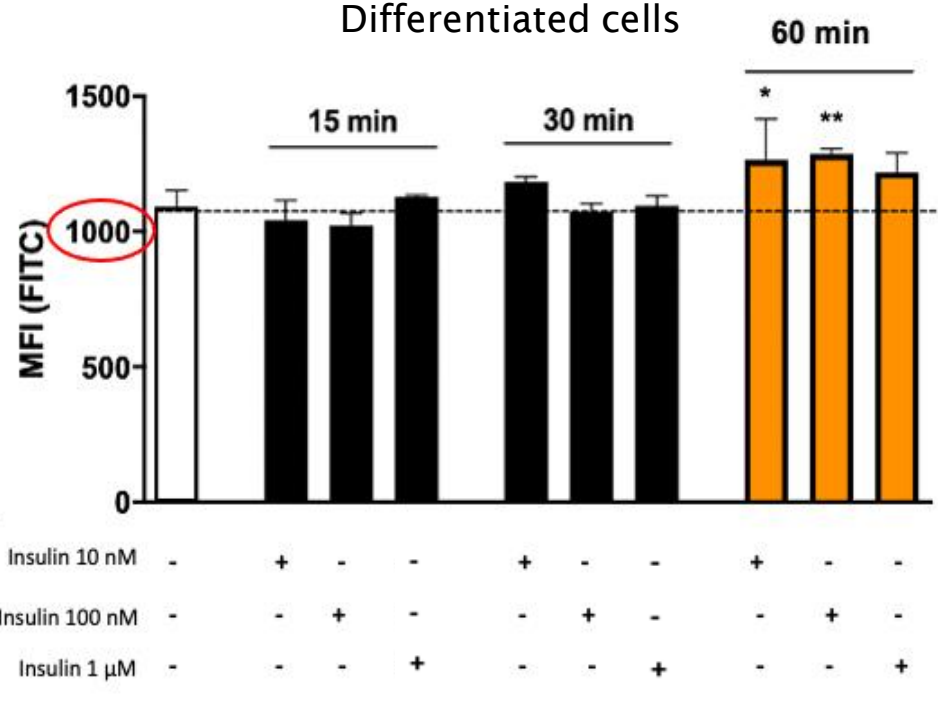
*n=3, mean±SD. ***P<0.001 (one-way ANOVA multiple comparison)*

GLUCOSE UPTAKE: INSULIN TIME & DOSE-RESPONSE (FACS)

Non-differentiated cells

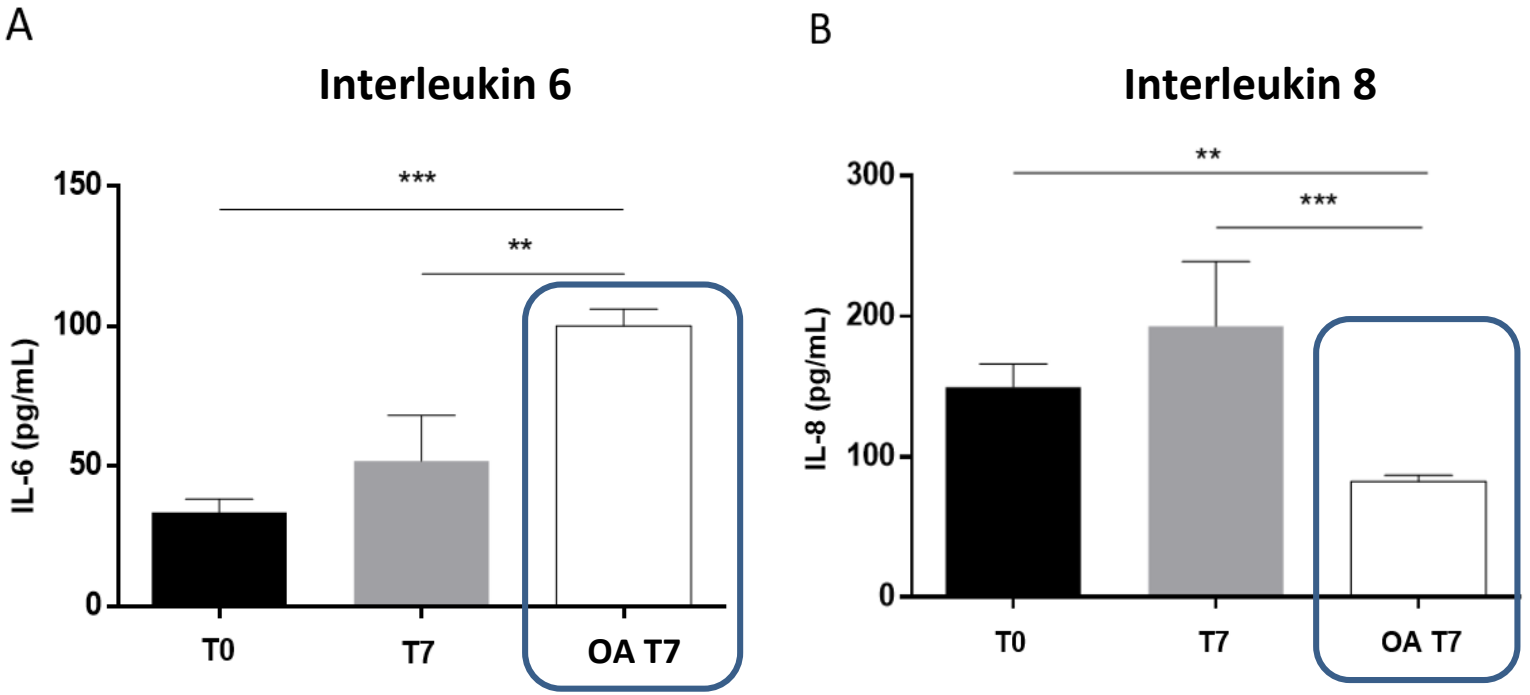


Differentiated cells



*n=3, mean±SD. *P<0.05, **P<0.01, ***P<0.001 (one-way ANOVA multiple comparison)*

PRO-INFLAMMATORY CYTOKINES SECRETION: INTERLEUKIN-6 & INTERLEUKIN-8 (ELISA)



*n=3, mean±SD. **P<0.01, ***P<0.001 (one-way ANOVA multiple comparison)*

CAMEROONIAN SPICE EXTRACTS: MOLECULAR MECHANISMS OF ACTION TO PROMOTE CARDIO-METABOLIC HEALTH

Oxidative Stress Modulation by Cameroonian Spice Extracts in HepG2 Cells: Involvement of Nrf2 and Improvement of Glucose Uptake

Achille Parfait Atchan Nwakiban [1], Stefania Cicolari [2], Stefano Piazza [2], Fabrizio Gelmini [3], Enrico Sangiovanni [2], Giulia Martinelli [2], Lorenzo Bossi [2], Eugénie Carpentier-Maguire [4], Armelle Deutou Tchamgoue [5], Gabriel A. Agbor [5], Jules-Roger Kuiaté [1], Giangiacomo Beretta [3], Mario Dell'Agli [2,*] and Paolo Magni [2,6,*]

Dietary Cameroonian Plants Exhibit Anti-Inflammatory Activity in Human Gastric Epithelial Cells

Achille Parfait Atchan Nwakiban [1,2], Marco Fumagalli [2], Stefano Piazza [2], Andrea Magnavacca [2], Giulia Martinelli [2], Giangiacomo Beretta [3], Paolo Magni [2,4], Armelle Deutou Tchamgoue [5], Gabriel Agbor Agbor [5], Jules-Roger Kuiaté [1], Mario Dell'Agli [2,*] and Enrico Sangiovanni [2]

Hydroethanolic plant extracts from Cameroon positively modulate enzymes relevant to carbohydrate/lipid digestion and cardio-metabolic diseases

Achille Parfait Atchan Nwakiban, †[a] Arold Jorel Sokeng,†[b] Mario Dell'Agli, [c] Lorenzo Bossi,[c] Giangiacomo Beretta, [d] Fabrizio Gelmini, [d] Armelle Deutou Tchamgoue,[e] Gabriel Agbor Agbor,[e] Jules-Roger Kuiaté,[a] Maria Daglia*[b,f] and Paolo Magni *[c,g]

Hydromethanolic Extracts from *Adansonia digitata* L. Edible Parts Positively Modulate Pathophysiological Mechanisms Related to the Metabolic Syndrome

Stefania Cicolari [1,†], Marco Dacrema [2,†], Arold Jorel Tsetegho Sokeng [3,†], Jianbo Xiao [4], Achille Parfait Atchan Nwakiban [5], Carmen Di Giovanni [2], Cristina Santarcangelo [2], Paolo Magni [1,6,*] and Maria Daglia [2,4,*]

CAMEROONIAN SPICE EFFECT ON DIFFERENTIATED SW 872 ADIPOCYTES

	Triglyceride Reduction	Glucose Uptake Stimulation	ROS Production	IL−6 Reduction	IL−8 Reduction
Xylopia aethiopica	−14.5%		+55.8%		−21.1%
Xylopia parviflora	−13.8%		−50.5%		−36.8%
Scorodophloeus zenkeri	−18.5%				
Monodora myristica	−15.3%		−40%		−24.3%
Tetrapleura tetraptera	−13.8%	+40.8%	−27.4%	−29.7%	
Echinops giganteus	−11.3%		−43.6%	−29%	
Afrostyrax lepidophyllus	−16.5%		−24.6%		
Dichrostachys glomerata	−17.4%			−40%	
Aframomum melegueta	−13%	+41.7%		−43.1%	
Aframomum citratum	−16%				−58.6%
Zanthoxylum leprieurii	−13.4%	+56.6%			−32.7%

CONCLUSIONS

The intracellular lipids accumulation shows a higher accumulation of triglycerides in differentiated cells than non-differentiated.

The glucose uptake shows that non-differentiated SW 872 cells allow twice as much glucose input than differentiated cells, despite non-differentiated cells do not respond to insulin.

The phosphorylated Akt fraction in differentiated cells increases in a time dependent manner more markedly than in non-differentiated cells.

The secretion of pro-inflammatory cytokines, show an increase in IL-6 associated to differentiation; and it is also been observed that secretion of IL-6 increases from T0 to T7 in non-differentiated cells. On the contrary, differentiated cells show a lower release of IL-8 than non-differentiated cells.

Plant extracts of Cameroonian show a modulation of the glucometabolic and inflammatory aspects in SW 872 cells, suggesting that these cells could be used for the screening of functional compounds or extracts of natural origin.

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