

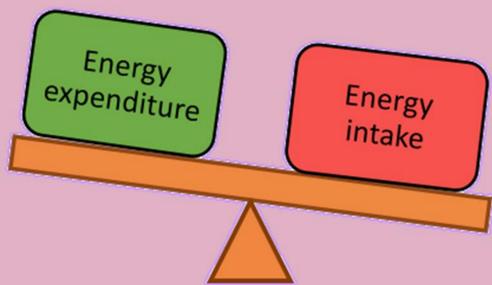
The fat that makes you thinner

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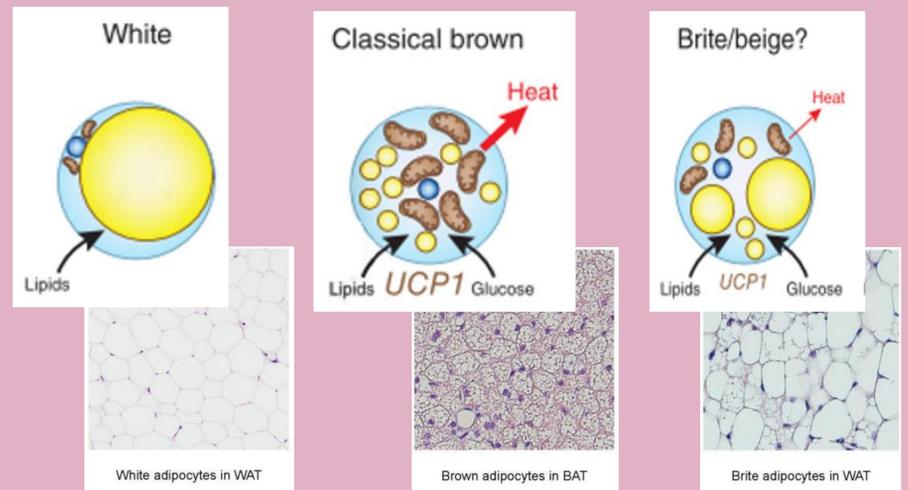
A new weapon to fight obesity?

Treball de Fi de Grau
Ciència i Tecnologia dels Aliments

1. Obesity: a world wide problem

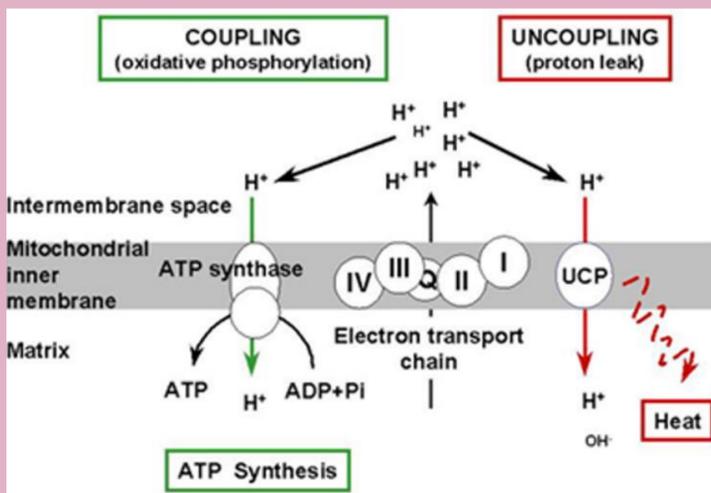


2. Types of adipose tissue in mammals



3. Mechanism of UCP-1

BAT is able to produce heat without shaking thanks to the high levels of UCP-1 in its mitochondria. UCP-1 uncouples the electron transport chain producing heat instead of ATP.



<http://people.duke.edu/~sc9/research.html>

	White (WAT)	Brown (BAT)	Brite or beige
Features	One lipid droplet	Multiple lipid droplet Many mitochondria Expresses UCP-1 ↑ vascularized and innervated by the SNS	Features from both white and brown adipocytes
Function	Energy storage	Combusts energy Thermogenesis	Energy storage Thermogenesis
Origin	Myf5-negative mesenchymal cell	Myf5-positive mesenchymal cell	Myf5-negative mesenchymal cell

4. Regulation of the tissue's activity

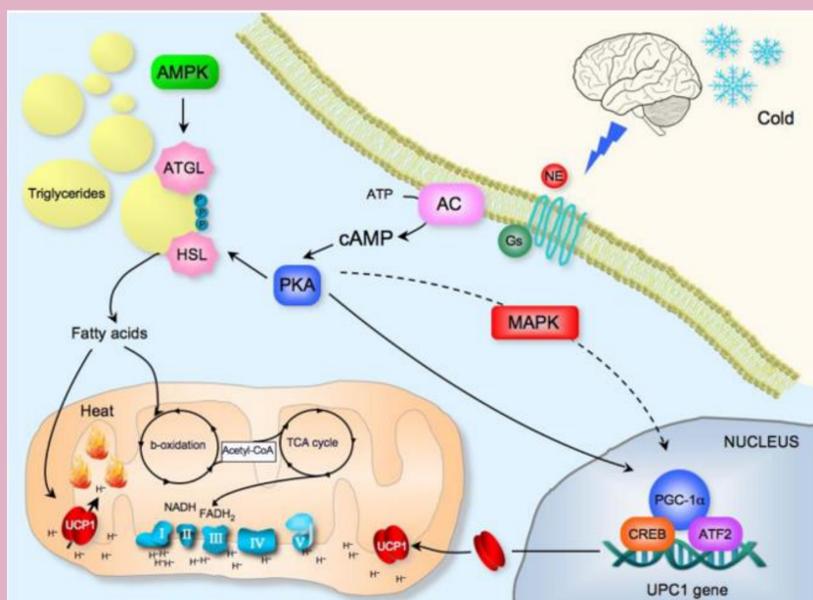
Thermogenesis is activated by the sympathetic nervous system, which in turn is activated by cold and diet. Norepinephrine produces a chain reaction.

COLD



&

DIET



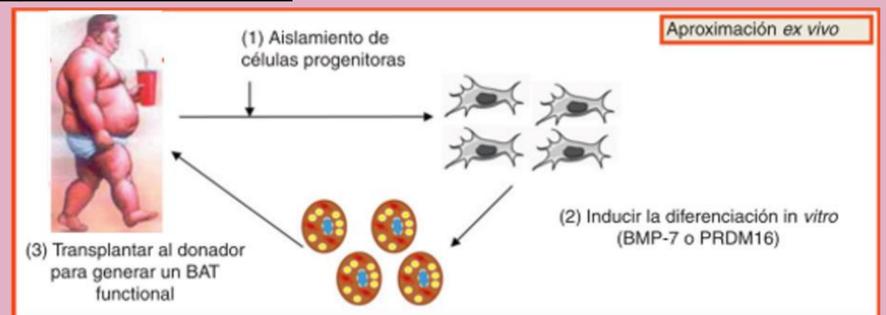
Villena J. (2008). Vall d'Hebron-Research Inst. 1-25.

5. Is the adaptive thermogenesis a potential tool to fight against obesity?

Approach "in vivo"

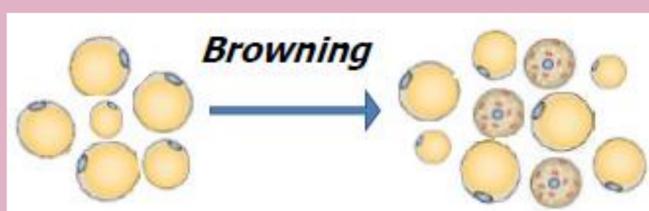
- ❖ Proliferation and differentiation of progenitor cells or beige adipocytes to BAT
- ❖ Increase of the mitochondrial mass
- ❖ Increase UCP-1 expression in BAT

Approach "ex vivo"



Gomez, A. et al. (2012). *Clínica e investigación en arteriosclerosis*. 2013;25(1)36-44

The browning process



Irisin
Thyroid hormones

Appearance of beige adipocytes among white adipocytes

6. Conclusions

Alternative ways to treat obesity are needed.

BAT has taken many importance since it was discovered that exist this type of adipose tissue in adult humans.

There is still a long way to go but a promising world of new therapies is ahead of us.

If we want a healthy society, we all have something to do.



References

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