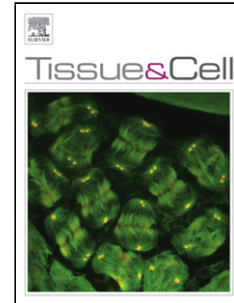


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Brown adipose tissue: updates in cellular and molecular biology

Running title: Brown adipose tissue updates

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Graphical Abstract

Graphical abstract. Acute thermogenic effects on brown adipose tissue. Norepinephrine released from the sympathetic nervous system binds to its adrenergic receptor beta 3 (AR-beta3) with consistent production of cyclic adenosine monophosphate (cAMP) and activation of protein kinase A (PKA). PKA, in turn, activates adipose triglyceride lipase (ATGL) and hormone-sensitive lipase (HSL) and impairs (through phosphorylation) perilipin activity, therefore, initiating lipolysis. The released free fatty acids (FFA) are channeled to mitochondria, through carnitine palmitoyltransferase 1 (CPT1), for serving as fuel to beta-oxidation and, at the same time, they activate uncoupling protein 1 (UCP1), initializing thermogenesis.

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