Series GSE7032

Query DataSets for GSE7032

Status	Public on May 31, 2007
Title	Brown and white adipocyte differentiation
Organism	Mus musculus
Experiment type	Expression profiling by array
Summary	Attainment of a brown adipocyte cell phenotype in white adipocytes, with their abundant mitochondria and increased energy expenditure potential, is a legitimate strategy for combating obesity. The unique transcriptional regulators of the primary brown adipocyte phenotype are unknown, limiting our ability to promote brown adipogenesis over white. In the present work, we used microarray analysis strategies to study primary preadipocytes, and we made the striking discovery that brown preadipocytes demonstrate a myogenic transcriptional signature, whereas both brown and white primary preadipocytes demonstrate signatures distinct from those found in immortalized adipogenic models. We found a plausible SIRT1-related transcriptional signature during brown adipocyte differentiation that may contribute to silencing the myogenic signature. In contrast to brown preadipocytes or skeletal muscle cells, white preadipocytes express Tcf21, a transcription factor that has been shown to suppress myogenesis and nuclear receptor activity. In addition, we identified a number of developmental genes that are differentially expressed between brown and white preadipocytes and that have recently been implicated in human obesity. The interlinkage between the myocyte and the brown preadipocyte confirms the distinct origin for brown versus white adipose tissue and also represents a plausible explanation as to why brown adipocytes ultimately specialize in lipid catabolism rather than storage, much like oxidative skeletal muscle tissue. Keywords: In vitro differentiation
Overall design	Comparisons of white and brown pre- and mature-adiposytes
Contributor(s)	Larsson O, Timmons JA
Citation(s)	Timmons JA, Wennmalm K, Larsson O, Walden TB et al. Myogenic gene expression signature establishes that brown and white adipocytes originate from distinct cell lineages. *Proc Natl Acad Sci U S A* 2007 Mar 13;104(11):4401-6. PMID: 17360536
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Platforms (1)	GPL81 [MG_U74Av2] Affymetrix Murine Genome U74A Version 2 Array
Samples (24) Less...	GSM162532 Primary brown adipocytes 4 days in culture B_y_05
	GSM162533 Primary brown adipocytes 4 days in culture B_y_06
	GSM162534 Primary brown adipocytes 4 days in culture B_y_09
	GSM162535 Primary brown adipocytes 4 days in culture B_y_10
	GSM162536 Primary brown adipocytes 4 days in culture B_y_19
	GSM162537 Primary brown adipocytes 7 days in culture B_o_07
	GSM162538 Primary brown adipocytes 7 days in culture B_o_08
	GSM162539 Primary brown adipocytes 7 days in culture B_o_11
	GSM162540 Primary brown adipocytes 7 days in culture B_o_12
	GSM162541 Primary brown adipocytes 7 days in culture B_o_22
	GSM162542 Primary white adipocytes 4 days in culture W_y_33
	GSM162543 Primary white adipocytes 4 days in culture W_y_34
	GSM162544 Primary white adipocytes 4 days in culture W_y_37
	GSM162545 Primary white adipocytes 4 days in culture W_y_38
	GSM162546 Primary white adipocytes 4 days in culture W_y_41
	GSM162547 Primary white adipocytes 4 days in culture W_y_42
	GSM162548 Primary white adipocytes 4 days in culture W_y_45
	GSM162549 Primary white adipocytes 4 days in culture W_y_51
	GSM162550 Primary white adipocytes 7 days in culture W_o_35
	GSM162551 Primary white adipocytes 7 days in culture W_o_36
	GSM162552 Primary white adipocytes 7 days in culture W_o_39
	GSM162553 Primary white adipocytes 7 days in culture W_o_40
	GSM162554 Primary white adipocytes 7 days in culture W_o_43
	GSM162555 Primary white adipocytes 7 days in culture W_o_44

Relations

BioProject	PRJNA98391

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MINiML formatted family file(s)	MINiML
Series Matrix File(s)	TXT

Supplementary file	Size	Download	File type/resource
GSE7032_RAW.tar	64.3 Mb	(http)(custom)	TAR (of CEL)
Raw data provided as supplementary file			