Epi-Tissue-Score: Bone Marrow *vs.* Adipose Tissue

Are your MSCs from bone marrow or adipose tissue?

Mesenchymal stromal cells (MSCs) can be isolated from various different tissues, such as bone marrow (BM) or adipose tissue (AT). There is a growing perception that MSCs isolated from these two tissues differ significantly in their differentiation potential, hematopoiesis supportive function, and immunomodulatory potential – although they look phenotypically very similar. Our Epi-Tissue-Score enables retrospective analysis of the tissue of isolation.

How does it work?

We identified two CpG dinucleotides – associated with the genes *SLC41A2* and *TM4SF1* – that are either methylated in MSCs from bone marrow or adipose tissue, respectively. The Epi-Tissue-Score is determined as the difference of these DNAm levels: a level above 0 is indicative for MSCs from bone marrow.

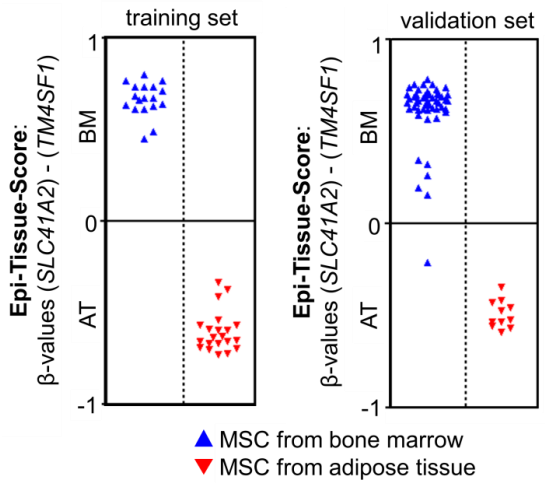

Figure 1: Epi-Tissue-Score on DNAm profiles. *DNAm levels (β-values) at two CpG sites can discern MSCs from bone marrow and adipose tissue (blue and red, respectively). The two DNAm levels were combined to the Epi-Tissue-Score that correctly classified 100 % of the training set and 98.5 % of the validation set.*

Site-specific analysis of DNA methylation

We generated pyrosequencing assays that facilitate fast and cost-effective analysis of DNAm levels at the two relevant CpGs (*SLC41A2* and *TM4SF1*). This approach facilitates reliable quantification of the Epi-Tissue-Score.

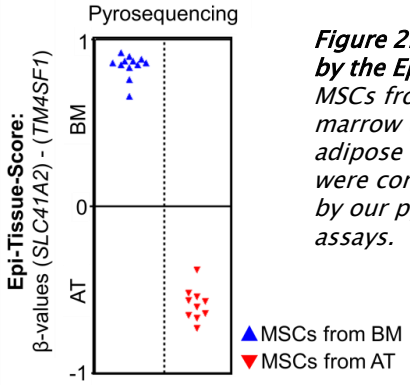

Figure 2: Classification by the Epi-Tissue-Score *MSCs from bone marrow (BM) and adipose tissue (AT) were correctly classified by our pyrosequencing assays.*

Our service for you:

- You send us genomic DNA of your cells of interest (MSCs from either bone marrow or adipose tissue). Shipment can be performed at room temperature (if possible >200 ng DNA)
- We perform bisulfite conversion of DNA
- We analyze DNA-methylation at the two relevant sites by pyrosequencing
- We calculate the Epi-Tissue-Score
- Results – including pyrograms, raw data, and graphical presentation – are provided by Email (usually within two weeks)

Publication:

- de Almeida CD, *et al.*, ***Stem Cell Reports*** 2016; 6:168-175
- Patent application: 2016; EP16152198.4

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