

Epi-MSC-Score: Classification of MSCs vs. Fibroblasts

Are your cells MSCs or fibroblasts?

Mesenchymal stromal cells (MSCs) raise high hopes in regenerative medicine – but reliable molecular markers to discern MSCs and fibroblasts were so far elusive. Our Epi-**MSC-Score** provides a simple and robust approach to support classification of these two cell types. This facilitates quality control of your cell preparations.

How does it work?

To identify relevant genomic regions that can discern MSCs and fibroblasts, we utilized 83 DNA methylation (DNAm) profiles from 12 studies for a training set and 107 DNAm profiles of 16 studies as validation set. Thereby, we identified two CpG dinucleotides – associated with the genes *C3orf35* and *CIDEA* – that are rather methylated in MSCs or fibroblasts, respectively. The Epi-**MSC-Score** is determined as the difference of these DNAm levels: a level above 0 is indicative for MSCs.

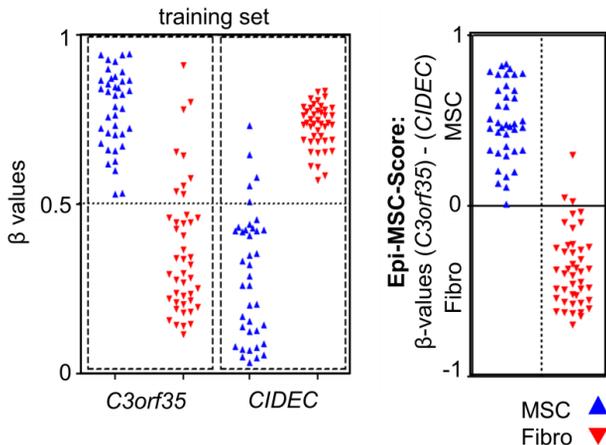


Figure 1: Analysis of DNAm profiles. DNAm levels (β -values) at two CpG sites that can discern MSCs and fibroblasts (blue and red, respectively) in 83 profiles of the training set. These two DNAm levels were subsequently combined for the Epi-**MSC-Score** in the right panel.

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 (*C3orf35* and *CIDEA*). This approach facilitates reliable quantification of the Epi-**MSC-Score**.

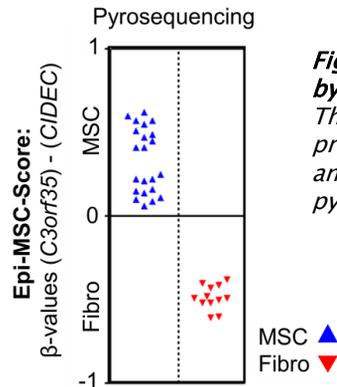


Figure 2: Classification by the Epi-MSC-Score**.** Thirty-four cell preparations were analyzed with our pyrosequencing assays.

Our service for you:

- You send us genomic DNA of your cells of interest (either MSCs or fibroblasts). 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-**MSC-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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