

Replicative Senescence Analysis

Are your cells senescent?

Long-term culture has a tremendous impact on proliferation and differentiation potential of various cell types. We provide a simple and reliable method to track long-term culture by analysis of specific DNA methylation changes. Our epigenetic-senescence-signature facilitates reliable prediction of the senescent state of your cells.

Advantages of the Epigenetic-Senescence-Signature

Alternative methods to estimate the state of cellular aging such as telomere length analysis and senescence-associated β -galactosidase expression are imprecise and not quantitative. Our epigenetic-senescence-signature meets these requirements. Our method is applicable for fresh and cryopreserved samples. Isolated DNA is relatively stable and thus can be shipped at room temperature.

How does it work?

We measure DNA-methylation levels (β -values) at six specific CpG sites by pyrosequencing. Based on these results, we estimate the number of passages and cumulative population doublings (cPD) of cells during culture expansion. Thereby, this method supports quality control of your cell culture.

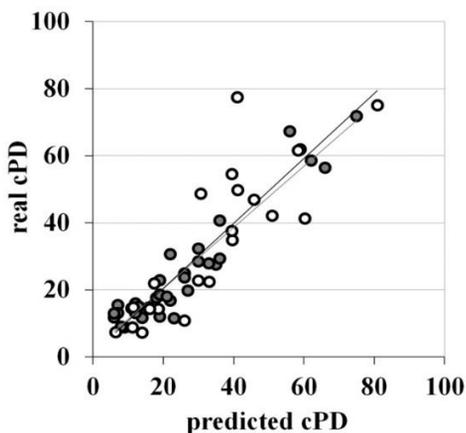


Figure 2: Six CpG sites reflect the number of passages and cPD. Combination of the six CpG sites facilitates reliable estimation of cPD in mesenchymal stem cells and dermal fibroblasts.

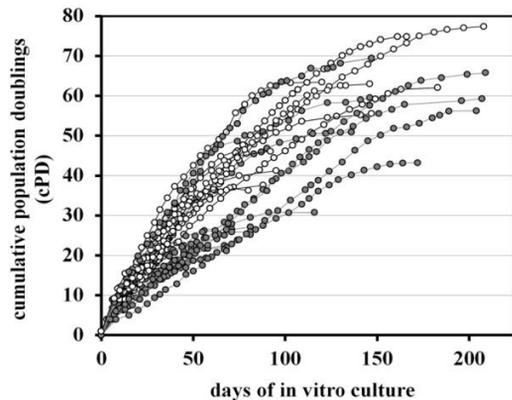


Figure 1: Culture expansion leads to a decline of cPD. Long-term growth curves of mesenchymal stem cells and dermal fibroblasts expanded with FCS and human platelet lysate (HPL).

Our service for you:

- You send us genomic DNA of your cells of interest (e.g. MSC or fibroblasts). Shipment can be performed at room temperature (if possible >200 ng DNA)
- We perform bisulfite conversion of DNA
- We analyze the DNA-methylation at the six relevant CpG sites by pyrosequencing
- We predict the number of cumulative population doublings
- We estimate passage numbers and days of culture expansion
- Results - including raw data, and graphical presentation - are provided by Email (usually within two weeks)

Publications:

- Koch C., Wagner W., et al. *Aging Cell* 2012; 11:366-369
- Koch C., Wagner W. *Methods in Molecular Biology* 2013; 1048:309-321

Further Information

Please visit us at www.cygenia.com.