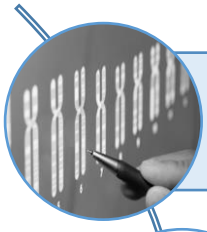
Telomere Analysis Technology®

TELOMERE ANALYSIS TECHNOLOGY

Life Length, the world leader in telomere measurement and diagnostics, offers corporate clients a range of customized services to support R&D product development and in clinical studies.

TAT® is a proprietary technology that assesses telomere length individually. We measure **telomere length** using high-content screening, high-throughput *in situ* fluorescence hybridization, providing a comprehensive analysis of **the entire distribution of telomere length ranging from the shortest to the longest telomeres, including frequency, mean and median values.**

Technology Value



Accurate and reproducible

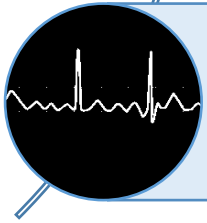
- Robust results in 384-well plates
- Intra-assay coefficient of variation <5%

Versatile

- Can be performed on any cell type including blood cells, primary tissue cultured cells and stem cells
- *In vitro* research, pre-clinical and clinical studies

Relevant

- Telomere length distribution, in particular critically short telomeres, is a key parameter in age related and chronic diseases, stem cell therapies and research, oncology product development, nutraceutical and cosmetic efficacy testing



Total Reliability

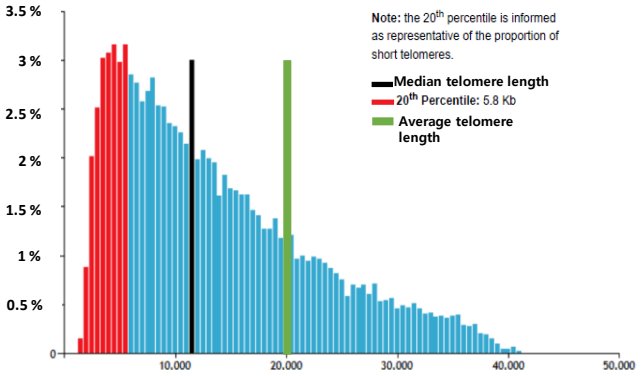
- Five positive control cell lines of established telomere lengths and two negative controls
- Each sample is run in quintuplicate to ensure statistical significance
- Output: customized fully-informative report with telomere length distribution and % of short telomeres
- Typically more than 100,000 telomeres are measured per sample

LIFE LENGTH

Other methods comparision

(Highlighted, services offered by Life Length)

Method:	TRF	STELA	T/S Q-PCR and MMQPCR	Q-FISH	Flow FISH	TAT
Cell number required	1 to 3×10^6 (0.5 to 10 µg DNA)	1 to 1×10^5	Blood sample or DNA sample (20ng DNA/reaction)	Actively dividing cells for chromosome spread (cell type dependent) 15–20 metaphases analyzed	0.5 to 2×10^6 freshly isolated or frozen white blood cells Alternate processing of nuclei for other cell types	0.5 to 2×10^6 freshly isolated or frozen white blood cells, culture cells, stem cells...
Cell viability requirements	No	No	No	Yes	Yes	Yes
Estimate of telomere length	Mean length for total cell population	Single chromosome end specific length	Amplification of telomere to standard single copy gene ratio	Cell average length	Cell specific average length	Mean, Median, % of critically short telomeres
Replicate sample testing	No duplicate test for QTRF	1 reaction run in 10 to 20 gel lanes	3 replicate DNA extraction	No	2	5
Provides telomere distribution?	Yes	Yes	No	Yes	No (Mean TL per cell)	Yes
Throughput	Low	Low	High	Low	High	High
Reported Statistics						
Resolution	1 kb	0.1 kb	?	0.3 kb	0.2 – 0.3 kb	0.3 kb
Correlation to TRF**	"standard" 0.87 (*HphI*/*MnlI* vs *HinfI*/*RsaI*)	NA	0.67 - 0.36 (QPCR) 0.84(MMQPCR)	0.9	0.87 - 0.6	> 0.9
Inter-assay mean CV**	0.9 – 12% (Life Length < 5%)	1.4 - 16.2%	6 - 28%	~ 10%	3.3% - 9.5% (lymphocytes)	~ 5% (lymphocytes and culture cells)
Intra-assay mean CV**	<5% (Life Length < 5%)	< 5%	5 - 9.5%	11.2% (same slide)	1.6% - 10.8% (lymphocytes)	< 5% (lymphocytes and culture cells)
References	[PMID: 21085125] [PMID:25239152]	[PMID:20026586] [PMID:20331440] [PMID:25239152]	[PMID:25409313] [PMID:25239152] [PMID: 21824912] [PMID: 17545637]	[PMID: 12573379] PMID: 8733138	[PMID: 17406480] [PMID:25409313]	[PMID: 17369361]



Example of histogram in which critically short telomeres are reported

SAMPLE PROCESSING, STORAGE and SHIPPING

- ✓ Cells should be provided in single-cell suspension frozen in adequate freezing media to guarantee viability after thawing ≥ 80%
- ✓ Minimum of 1 million cells at a cell density of $1x10^6$ cells/ml.
- ✓ Aliquots may be stored at -80º C for a maximum of 10 days or in liquid nitrogen for long-term storage. Shipping to our laboratory facilities is on dry-ice.

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