



TECHNOLOGY OFFER

UP-086: New Senescence Marker for Cell-Culture

Key Facts

- Determining the replicative senescence status of a cell culture to maintain longterm functionality
- Assessing the suitability of a cell culture for therapeutic uses such as stem cell therapie

The Technology

Quantification of mRNA expression for 4 candidate genes (PARG1, CDKN2B, PTN, MCM3) was performed by quantitative real-time PCR (qRT-PCR) using the ABI PRISM® 7700HT Sequence Detection System Instrument (Applied Biosystems, Applied Biosystems GmbH, Darmstadt, Germany). Total RNA was reverse transcribed by using the high capacity cDNA reverse transcription kit.

The technology allows a more detailed characterization of a cell or cell culture regarding its potential for further proliferation and/or differentiation.

The method compares the replicative senescence status of different cells or cell cultures, which enables the standardization of experimental procedures. By comparing the amounts of at least one of the above mentioned gene products in at least two cells or cell cultures it is, furthermore, possible to identify the status of replicative senescence.

Background

Extensive propagation to yield enough mesenchymal stromal cells (MSC) for therapy may result in replicative senescence and thus hamper long term functionality *in vivo*.

Cellular aging of MSC preparations is not restricted to senescent passages but is a continuous process starting from the first passage. This process has far reaching implications in phenotype, differentiation potential, global gene expression and miRNA profiles that need to be taken into account for standardization and quality control of cell preparations.

The enzyme lysosomal pH6 β -galactosidase (SA- β -gal) has been shown to be active in senescent human fibroblasts, but not in quiescent, pre-senescent or differentiated cells. However, the staining procedure is not very standardized and can hardly be quantified to monitor the process of cellular aging.

Advantages

- standardized procedure
- quantifying and monitoring the process of cellular aging

Commercial Opportunity

Development of new quantitative cell-culture aging diagnostics.

Development Stage

Ready to use diagnostic method

Inventors

Wolfgang Wagner, Patrick Horn, Simone Bork, Anthony D. Ho, (University of Heidelberg, Germany), Katharina Schallmoser, Dirk Strunk, Christina Bartmann Eva Rohde (University Graz, Austria)

Intellectual Property

EP Patent application EP09164153.0

Reference:

Wolfgang Wagner Patrick Horn, Mirco Castoldi, Anke Diehlmann, Simone Bork, Rainer Saffrich, Vladimir Benes, Jonathon Blake, Stefan Pfister, Volker Eckstein, Anthony D. Ho

Cellular Aging of Mesenchymal Stem Cells has Incremental Impact on Phenotype, Function, Gene Expression and miRNA Profile, submitted.

Contact:

Dr. Volker Cleeves
TechnologyTransfer
Faculty of Medicine and Heidelberg University
Medical School
Im Neuenheimer Feld 672
69120 Heidelberg
Tel. +49-(0)6221-56-38392
Fax: +49-(0)6221-56-5714
Email: volker.cleeves@med.uni-heidelberg.de

In cooperation with:

