Cell Senescence Culture Facility (CSCF)

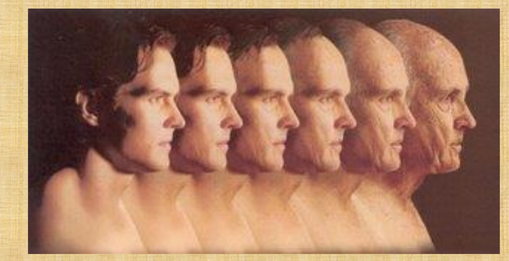
Director: Trygve Tollefsbol, Ph.D., D.O.

Comprehensive Center for Healthy Aging; Department of Biology

MISSION

The mission of the CSCF is to facilitate understanding of the basis of aging and to encourage the study of age-related diseases using *in vitro* model senescent cell lines. The purpose of the CSCF is to provide various types of aging cells to investigators interested in the aging process. A prime goal of the CSCF is to develop a research focus that impinges on the understanding of the basic phenotypic changes in senescent cells as well as the prevention of senescent pathways.

One of a few such facilities in the country, the CSCF is designed not only to facilitate studies of aging, but also to participate in new investigations in the mechanism of cellular aging and age-related diseases such as cancer. The CSCF is available to UAB investigators who are actively involved in studies of cellular aging as well as those who are considering aging studies. In addition to basic scientists, clinical faculty with ongoing studies related to the aging process are invited as collaborators.



Aging is the accumulation of changes in an organism or object over time.

Cellular senescence is a phenomenon where isolated cells demonstrate a limited ability (the Hayflick Limit) to divide in culture.

Leonard Hayflick

FACILITY DESCRIPTION

•Joint endeavor with UAB's Comprehensive Center for Healthy Aging and the Biology Department

•Facility located in Campbell Hall, Rooms 174-176

•Provisions to offer state of the art expertise in cell culture for aging-related research *in vitro*

•Directed by Dr. Trygve Tollefsbol

SERVICES OFFERED

- **Culture cells of any type to a designated age (cells must be provided by PI or obtained through collaborative efforts)**
- **Cell storage in liquid nitrogen with thawing and plating services**
- **DNA purification**
- **Population monitoring by cell counts; β-galactosidase staining**
- **Detection of telomerase activity**
- **Detection of *hTERT* expression**
- **Digital photomicroscopy**
- **On-site cell culture instruction/workshops**

PROJECTS

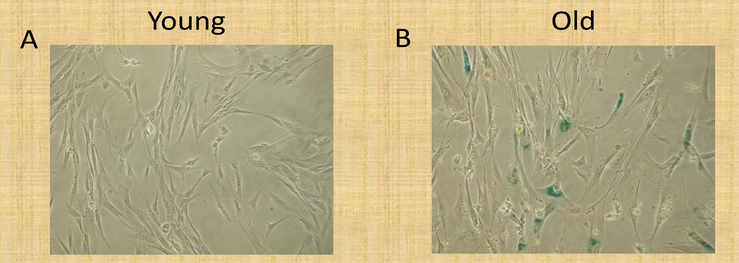
Measuring telomerase activity, epigenetics, p16 and other proteins in:

•Aging WI-38, MRC-5, IMR-90 cells as well as other cell types

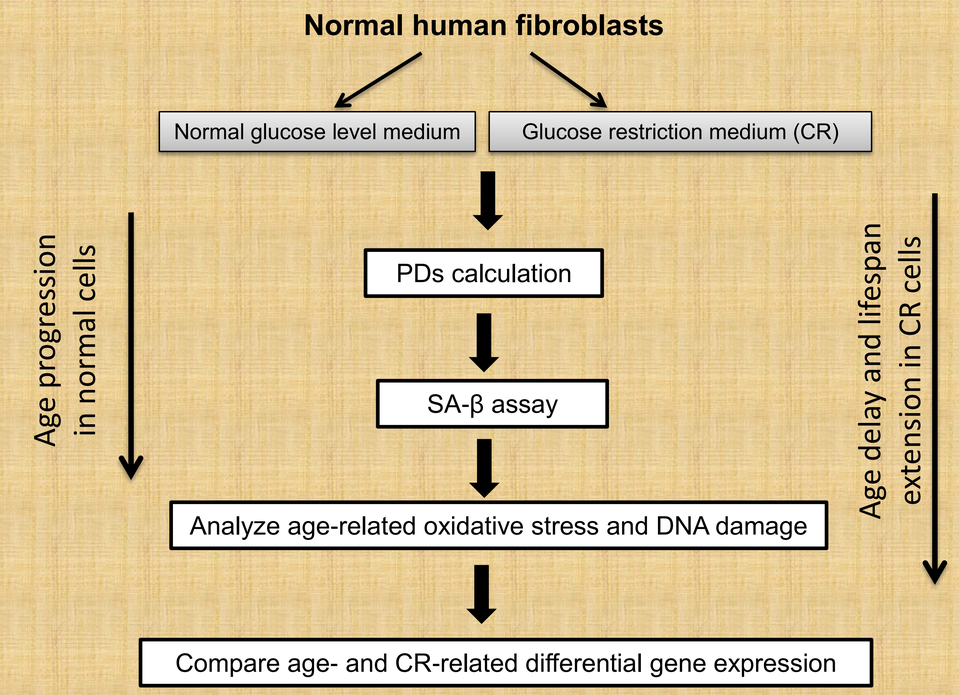
•Glucose-restricted aging cells

•Botanicals-treated aging WI-38 cells and breast cancer cells

WI-38 Human Fetal Lung Fibroblasts



Cellular senescence is determined by the senescence-associated β-galactosidase (SA-β-Gal) assay. Human WI-38 fibroblasts at a proliferating state (young, A) and at senescence (old, B) are subjected to SA-β-Gal staining and photographed. Blue staining cells are SA-β-Gal-positive or senescent cells. Magnification, ×100.

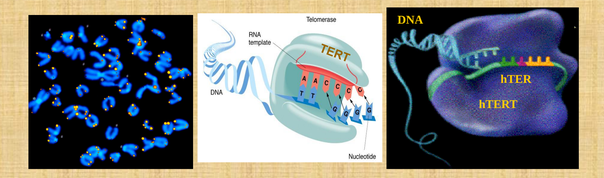


Schematic representation of the procedure for aging biomarker analyses in the CR *in vitro* model.

RESEARCH INFORMATION

Services include growing and supplying various cell lines to investigators who have an interest in cell senescence or age-related diseases such as Alzheimer's disease; osteoporosis, bone and metabolic diseases; degenerative joint disease; cancer; and CNS disorders as well as many other age-related conditions. The Core also collects and maintains an aging cell line repository for the storage of cell lines that provides ready access to cells by all interested investigators. The Core supports the conduct of research into the fundamental and clinical aspects of cell senescence using specific cell lines to probe the cell culture characteristics of phenotypic changes and underlying molecular or metabolic changes. Additionally, Core personnel offer a consultation service for the culture of various age-related cell lines for experimental projects. Aging-related project design and planning services are also offered.

Telomerase/Telomeres



Glucose Restriction Extends the Lifespan of Human Normal WI-38 Cells and Reduces Survival of Precancerous WI-38/S Cells

Li, Y., Liu, L., and Tollefsbol, T.O. (2010) Glucose restriction can extend normal cell lifespan and impair cancer cell growth through epigenetic control of hTERT and p16 expression. *FASEB Journal*, 24:1442-53.

Awarded best paper of 2010 by UAB-based investigators in nutrition or obesity (Science Unbound Foundation).

Visitors to the Cell Senescence Culture Facility

Dr. Leonard Hayflick

Dr. George Martin

Dr. Jerry Shay

Just Us

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We grow the cells so you can do the research.