Cell Senescence and Beyond

(CSB) Core

Co-Leaders:

Judith Campisi and Birgit Schilling

Cell Senescence and Beyond (CSB) Core

Provide consultation, standardized methods and experimental services to assess and characterize selected cell fate decisions for investigators in aging research.

- ***Cellular senescence****
- ***Cell death****
- ***(Cell competition)***

** numerous proteins, RNA and lipid biomarkers*

Cell Senescence and Beyond (CSB) Core

AIM 1: *Depending on the project, the Core will employ a variety of techniques, including immunocytochemistry, western analyses, mass spectrometry, PCR analyses of RNA or DNA from cells or tissues, to evaluate SnC burden.*

The Core will also advise on strategies to test the consequences of the cell fate decisions for aging phenotypes and pathologies in close neighboring cells.

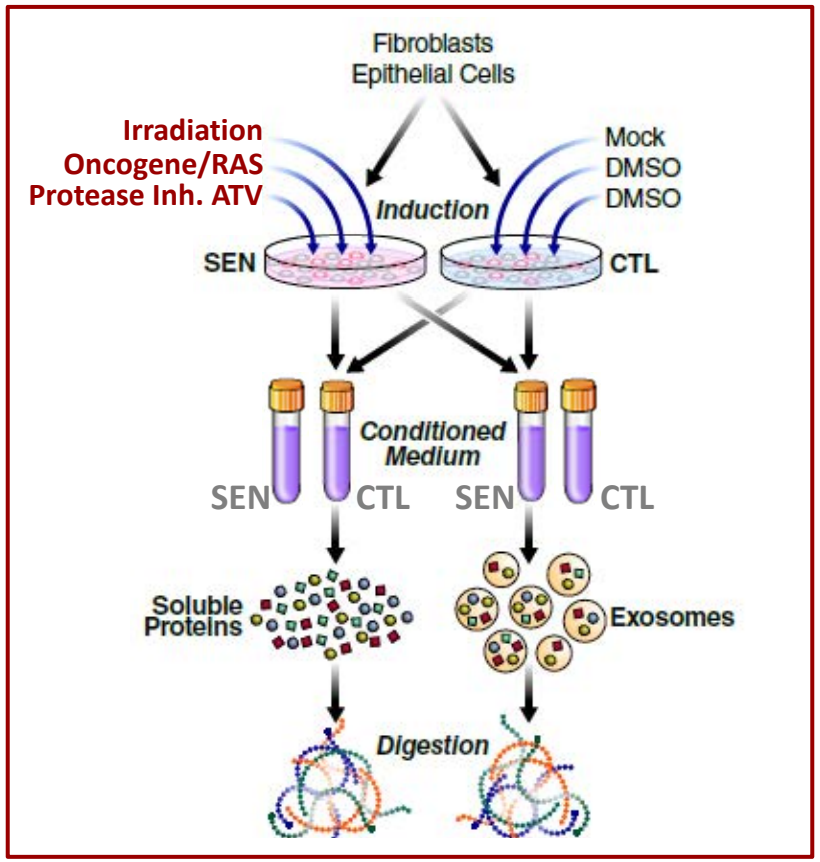
Cell Senescence and Beyond (CSB) Core

AIM 2: *Establish standardized methods to detect and assess the impact of the cell non-autonomous effects of the cell fate decisions of cellular senescence, cell death and cell competition using several of the techniques stated in Aim 1.*

The Core will also advise investigators on strategies to identify the most promising cell non-autonomous acting candidates and perform relevant assays where possible using distal neighboring cells and mouse tissues.

Potential Workflows for Proteomic Analysis

Example for Sample Preparation



PLOS BIOLOGY

METHODS AND RESOURCES

A proteomic atlas of senescence-associated secretomes for aging biomarker development

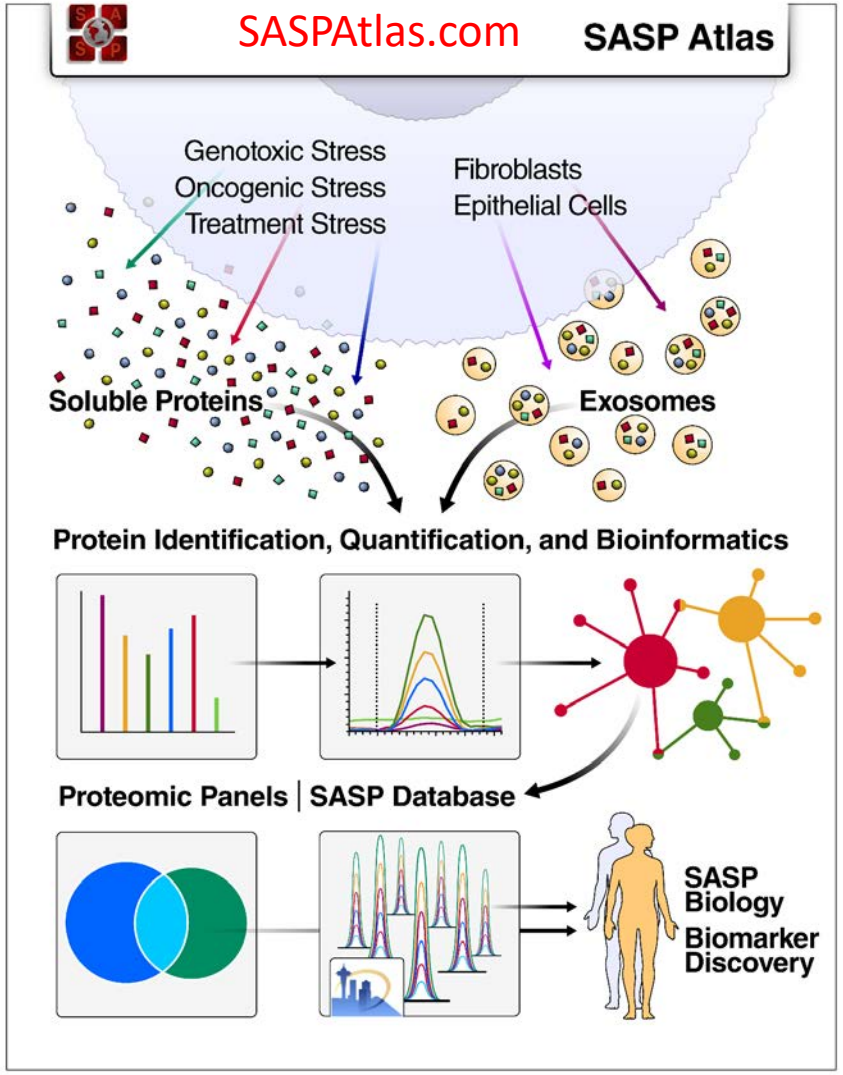
Nathan Basisty[1], Abhijit Kale[1], Ok Hee Jeon[1¤], Chisaka Kuehnemann[1], Therese Payne[1], Chirag Rao[1], Anja Holtz[1], Samah Shah[1], Vagisha Sharma[2], Luigi Ferrucci[3], Judith Campisi[1,4], Birgit Schilling[1]*

CURRENT PROTOCOLS
A Wiley Brand

Quantitative Proteomic Analysis of the Senescence-Associated Secretory Phenotype by Data-Independent Acquisition

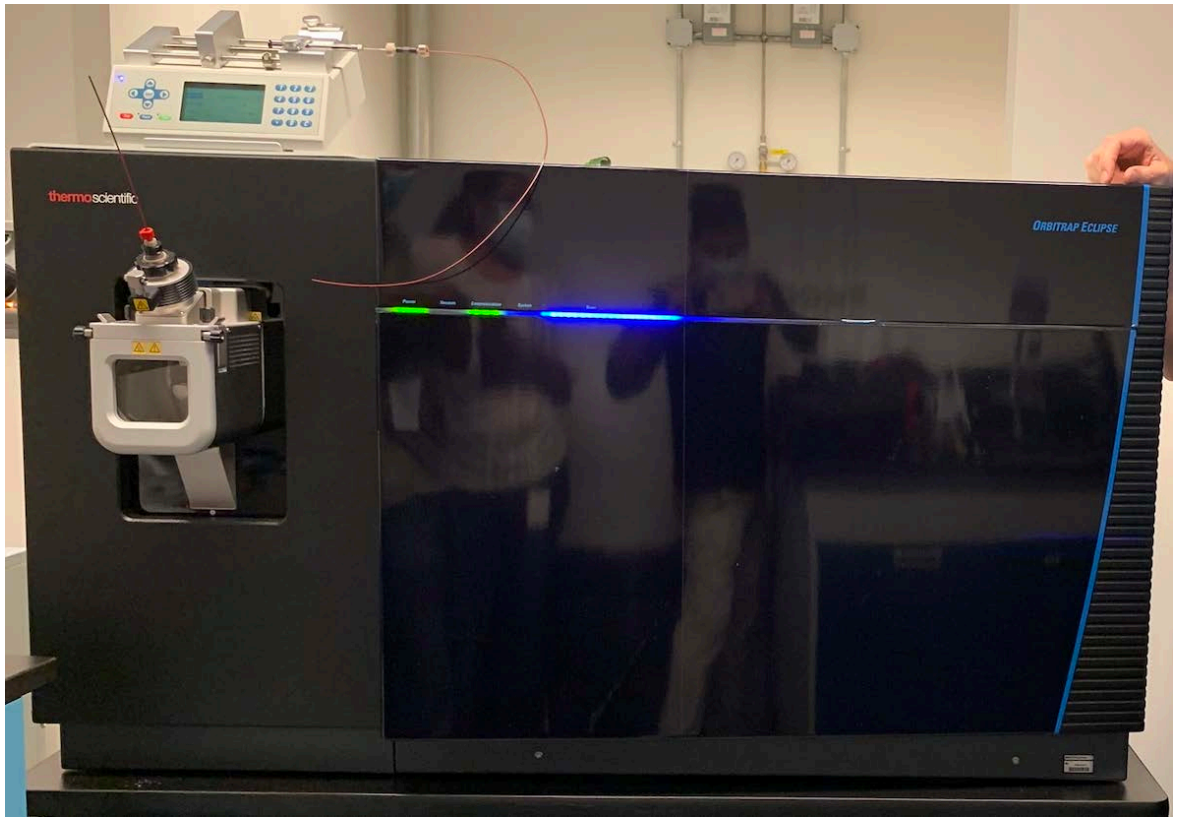
Francesco Neri,[1] Nathan Basisty,[1] Pierre-Yves Desprez,[1,2] Judith Campisi,[1,3] and Birgit Schilling[1,4]

Heterogeneity *of Senescence (MS)*

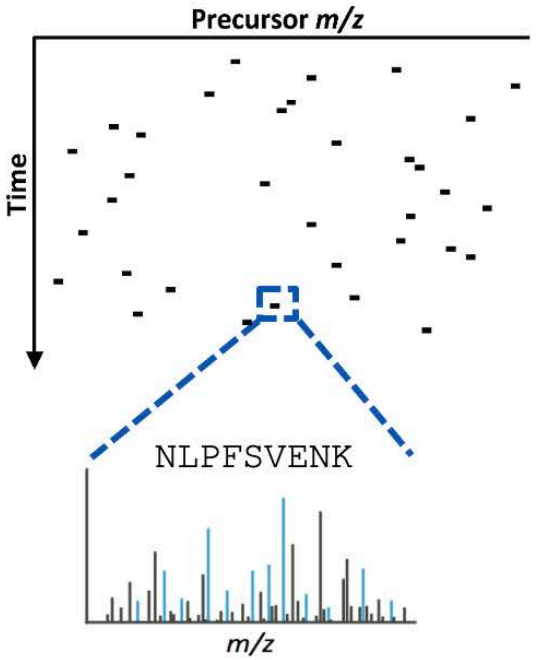


Modern proteomic techniques available for Pilot Projects
Orbitrap Eclipse, TripleTOF 6600, TripleTOF 5600, QTRAP 5500

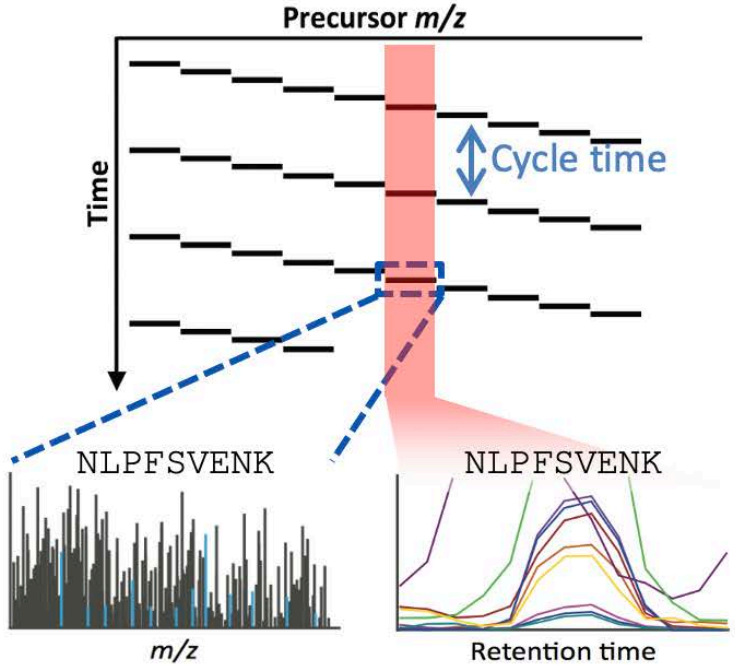
Protein Identification, Quantification, Targeted Assays



Data-Dependent Acquisition (DDA)



Data-Independent Acquisition (DIA/SWATH)



Database Searching

Matching to Spectral Libraries

Cell Senescence and Beyond (CSB) Core

Funded projects

Last Name	First Name	Internal/Externa	Institution	Title	Pilot/Voucher	Amount Requested	NSC-Core
January 2021 Applications							
Soukas	Alexander	External	MGH	Sgk3 associations with aging-related metabolic phenotypes	Pilot	$ 12,000.00	USC-GTASC
Turner	Christian	Internal	USC	Neuropeptide profiling of SKN-1gf mutants	Voucher	$ 7,500.00	Buck-GTC (Garrison)
Li	Jingjing	External	UCSF	Construct a deep convolutional neural network to computationally assi	Pilot	$ 20,000.00	Buck-GTC (Zhou)
Winer	Dan	Internal	Buck	The effects of mechanical tension on cell senescence and its secretory	Pilot	$ 16,998.00	Buck-CSBC
Moore	Darcie	External	Wisconsin-Madi	Uncovering the role of intermediate filaments in stress and aging using	Pilot	$ 20,000.00	Buck-GTC (Garrison)
Chanfreau	Guillaume	External	UCLA	Splicing factor PRPF8 and degenerative disease phenotypes	Pilot	$ 12,000.00	USC-GTASC
Lithgow	Gordon	Internal	Buck	Analysis of polymorphisms in candidate human kinases for association	Pilot	$ 12,000.00	USC-GTASC
Stuhr/Curran	Nicole/Sean	Internal	USC	Mass spec profiling of bacterial diets fed to C. elegans (6 microbial extr	Voucher	$ 7,200.00	Buck-CSBC
Kapahi	Pankaj	Internal	Buck	Single-cell sequencing of the mouse brain on a diet that lowers advanc	Pilot	$ 20,000.00	Buck-GTC (Kapahi/Furman)
Vinceguerra/Nha	Manlio/James	Internal	USC/ICRS-visitir	Compound Screening in C. elegans for improved healthspan	Voucher	$ 8,450.00	USC-GTC (Curran)
Dang	Weiwei	External	Baylor	Genetic association with Alzheimer disease and neurological outcome	Pilot	$ 12,000.00	USC-GTASC
Clayton	Zachary	External	Colorado-Bould	Using chip cytometry-based digital spatial profiling to elucidate novel m	Pilot	$ 15,000.00	Buck-GTC (Melov)
Preapproved from proposal submission							
Benayoun	Berenice	Internal	USC	Characterizing the transposon-induced secretome in human fibroblast	Voucher	$ 9,600.00	Buck-CSBC
Villa/Curran	Osvaldo/Sean	Internal	USC	Defining Aldh4a1 variants in muscle health of normal adult aging	Voucher	$ 4,078.00	USC-GTASC
Newman	John	Internal	Buck	HMGCS2 in Human Metabolism and Health	Pilot	$ 12,000.00	USC-GTASC

Core Pilots and Vouchers

Apply through the website

https://uscbucknsc.org

Contact Core Leaders with Questions

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