UNITY BIOTECHNOLOGY

PHASE 2 DATA PRESENTATION

August 17th, 2020

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This presentation and the accompanying oral commentary contain forward-looking statements, including: the expected timing of date from the 24 week endpoints from Unity's Phase 2 clinical study and Phase 1b high-dose, repeat-dose clinical study of UBX0101, statements regarding UNITY's understanding of cellular senescence and the role it plays in osteoarthritis and retinal diseases, the potential for UNITY to develop therapeutics to extend healthspan, including UBX1325 for retinal disease, expectations regarding the results of UNITY's clinical studies and UNITY's expectations regarding the sufficiency of its cash runway. These statements involve substantial known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from the information expressed or implied by these forward-looking statements. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. The forward-looking statements in this presentation represent our views as of the date of this presentation. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we have no current intention of doing so except to the extent required by applicable law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this presentation.

For a further description of the risks and uncertainties that could cause actual results to differ from those expressed in these forward-looking statements, as well as risks relating to the business of the Company in general, see UNITY's most recently filed Quarterly Report on Form 10-Q for the quarter ended June 30, 2020, filed with the Securities and Exchange Commission on July 31, 2020, as well as other documents that may be filed by UNITY from time to time with the Securities and Exchange Commission.

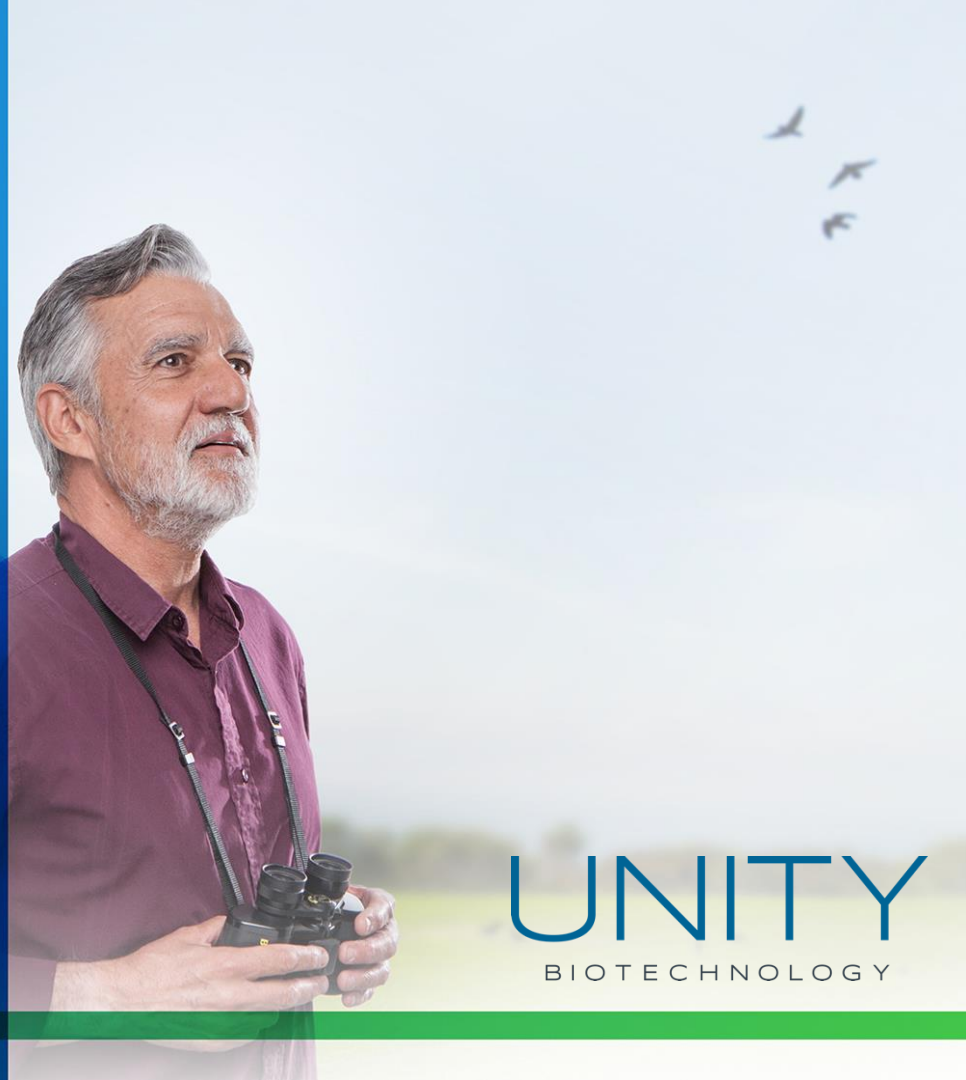
This presentation concerns drug candidates that are under clinical investigation and which have not yet been approved for marketing by the U.S. Food and Drug Administration. They are currently limited by Federal law to investigational use, and no representation is made as to their safety or effectiveness for the purposes for which they are being investigated.

TODAY'S CALL AGENDA

Introduction	**Lynne Sullivan,** Chief Financial Officer
UNITY Overview & Therapeutic Hypothesis	**Anirvan Ghosh, Ph.D.,** Chief Executive Officer
UBX0101 Ph 2 Program Overview and Efficacy and Safety Data	**Jamie Dananberg, M.D.**, Chief Medical Officer
UNITY Path Forward and Pipeline Evolution	**Anirvan Ghosh, Ph.D.,** Chief Executive Officer
Financial Metrics, Milestones, and Q&A	**Anirvan Ghosh, Ph.D.,** Chief Executive Officer **Jamie Dananberg, M.D.,** Chief Medical Officer **Lynne Sullivan,** Chief Financial Officer

UNITY OVERVIEW AND THERAPEUTIC HYPOTHESIS

Anirvan Ghosh, CEO



UNITY
BIOTECHNOLOGY

UNITY AIMS TO DEVELOP SENOLYTIC MEDICINES TO SLOW, HALT, OR REVERSE DISEASES OF AGING

Therapeutic Potential of Senolytic Medicines

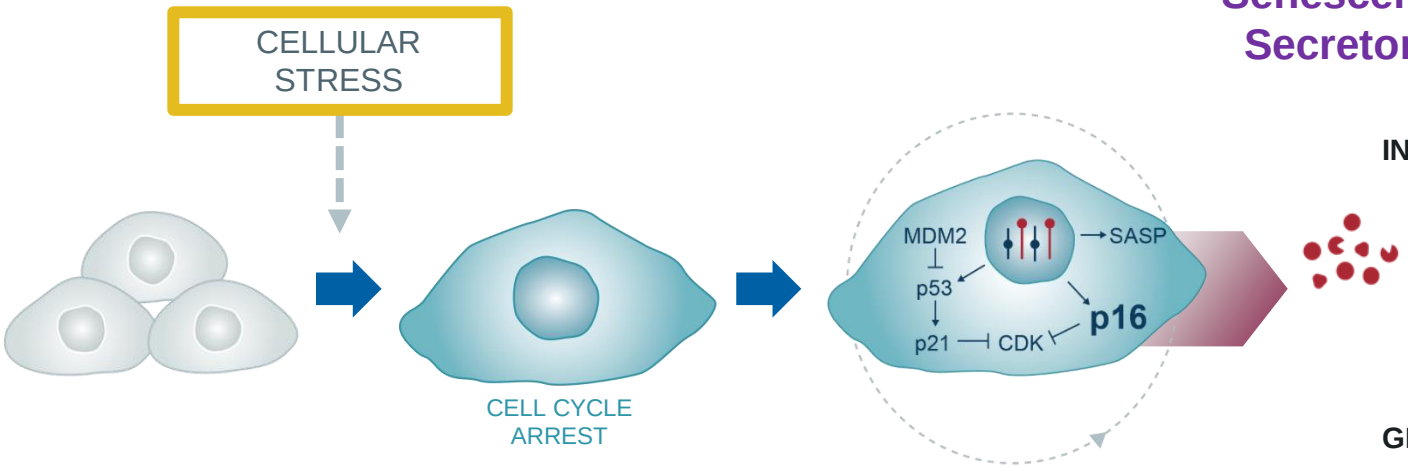
NEUROLOGY:
Alzheimer's, Vascular dementia, Parkinson's

OPHTHALMOLOGY:
AMD, Diabetic Retinopathy, DME

PULMONARY DISEASE:
IPF, COPD, PAH

MUSCULOSKELETAL DISEASES:
Osteoarthritis (knee, hip, hand, neck), immunologic diseases of joints

SENESCENT CELLS ARE IMPLICATED IN DISEASES OF AGING



Senescence-Associated Secretory Phenotype[1]

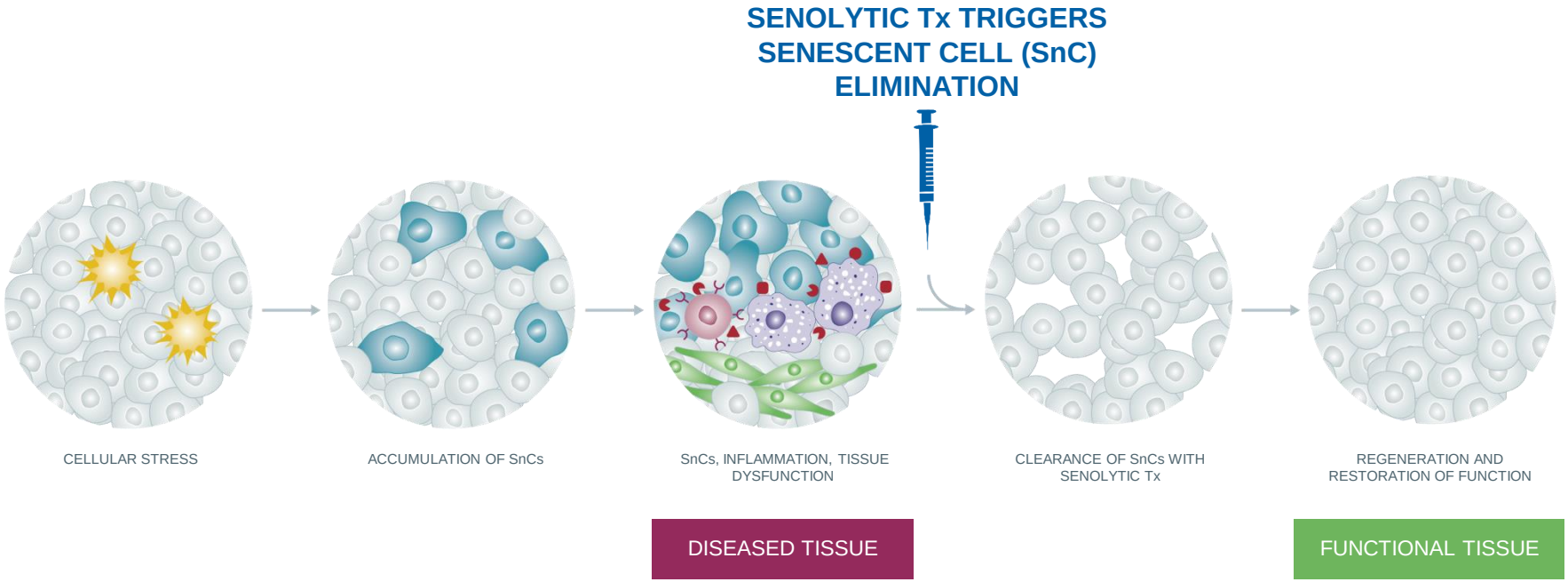
INFLAMMATORY FACTORS
(e.g., MMP1, TNF-α, IL-1β,)

PRO-FIBROTIC FACTORS
(e.g., TGFβ1, TIMP-1, MCP-1)

GROWTH FACTORS
(e.g., VEGF-A, IL-6, PAI-1)

[1]Coppe et al. *Annu Rev Pathol* 2010;5:99-118.

THERAPEUTIC RATIONALE FOR SENOLYTIC MEDICINES

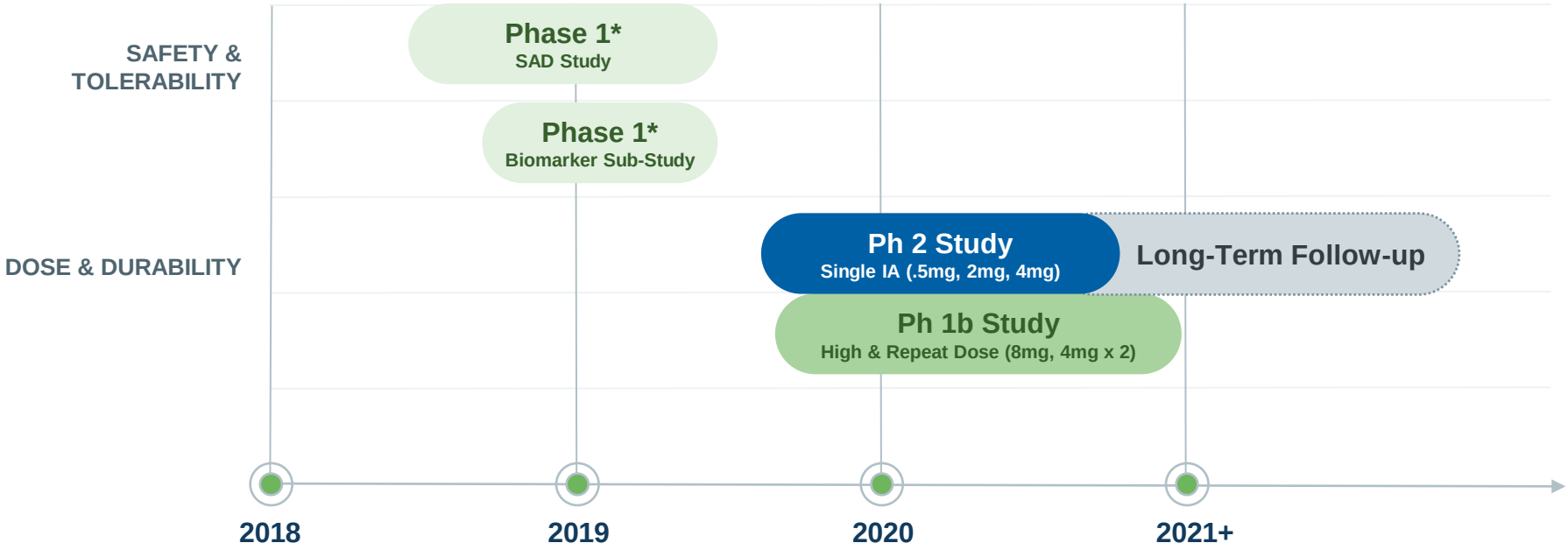


UBX0101
TOP LINE RESULTS in OSTEOARTHRITIS

Jamie Dananberg, CMO

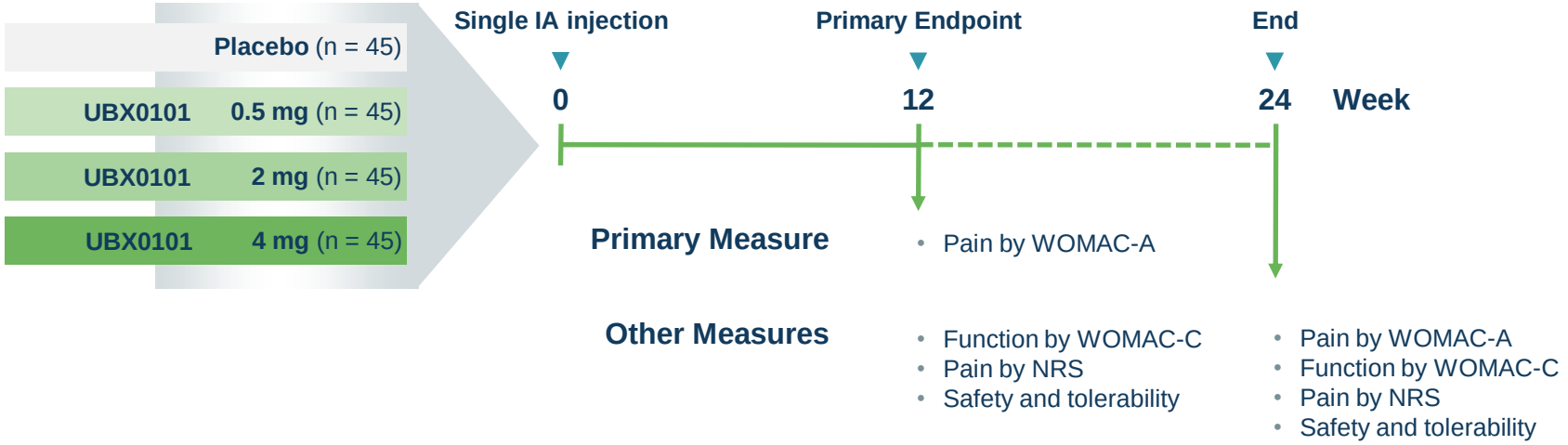
UNITY BIOTECHNOLOGY

UBX0101 CLINICAL PROGRAM



*Completed Study

UBX0101 PHASE 2 STUDY DESIGN



Phase 2 study evaluating a single intra-articular injection of UBX0101 over three different doses

SUMMARY

- We did not see separation of UBX0101 treatment groups from placebo at 12 weeks
- A thorough analysis of covariates and their ability to confound the results was completed and did not identify any that affected the conclusions from the study
- In addition we observed a placebo response in the Phase 2 study that was both large in magnitude and long in duration that further hampered the opportunity to detect a UBX0101 treatment effect
- UBX0101 was safe and well tolerated through the Week 12 timepoint; there were no study-treatment related SAE's during the conduct of the study and one patient ended participation due to a treatment-emergent AE
- We do not intend to advance UBX0101 to a pivotal study

PATIENT DEMOGRAPHICS

Demographic	MUS-201 Trial Population	
	Total Subjects (N=183)	Cohorts Balanced*
Age (yrs) ;Mean (SD)	62.9 (8.99)	YES
Gender (M:F)	(66:117)	YES
Race (%) (Asian/Black/White/Other)	1 / 38 / 143 / 1	YES
Ethnicity (%) (Hispanic/Non-Hispanic/Unknown)	28 / 155	NO* (p<0.10)
Weight (kg) ;Mean (SD)	84.7 (16.27)	YES
Height (cm) ;Mean (SD)	168.3 (9.77)	YES
BMI (kg/m^2) ;Mean (SD)	29.8 (4.66)	YES

* Determined by Fisher's Exact Test for categorical variables and ANOVA for continuous variables

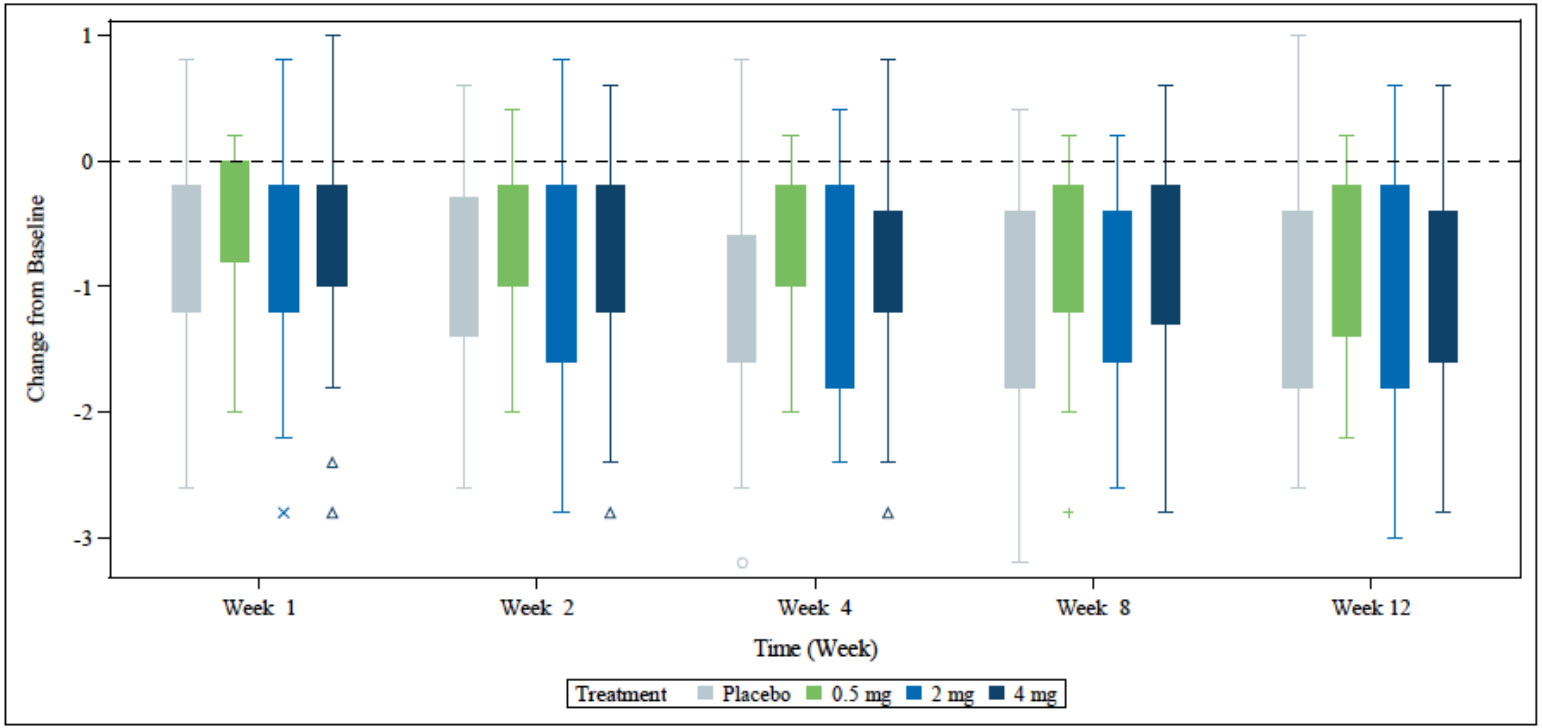
Source: Table 14.1.1I: Summary of Subject Disposition from Baseline to Week 12; Intent-to-Treat Population

MUS_201 BASELINE PATIENT CHARACTERISTICS

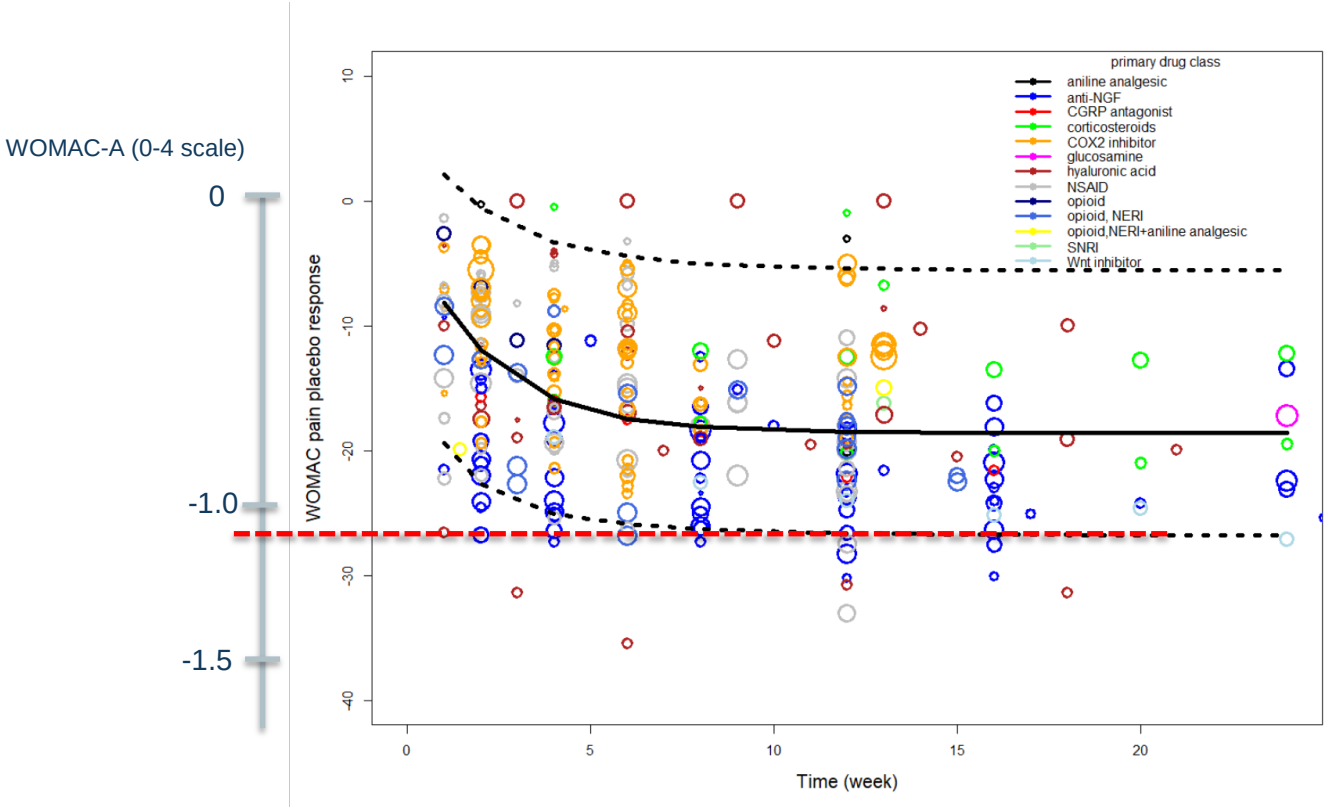
Baseline Characteristics		MUS-201 Baseline Characteristics by Treatment Assignment Mean (SD)				
Dose Group (n)		Placebo (N=46)	0.5 (N=45)	2.0 (N=46)	4.0 (N=46)	**Overall (N=183)**
Time Since Dx of OA (yrs)		12.9 (10.90)	9.9 (9.45)	9.8 (8.84)	8.9 (6.99)	10.4 (9.20)
BL WOMAC A Pain (0-4 Item Score Average)		2.20 (0.577)	2.05 (0.509)	2.08 (0.658)	2.11 (0.647)	2.11 (0.599)
BL Weekly Average NRS (0-10)		6.66 (1.382)	6.48 (1.167)	6.56 (1.463)	6.68 (1.542)	6.60 (1.387)
BL WOMAC C Function (0-4 Item Score Average)		2.26 (0.546)	2.17 (0.527)	2.16 (0.541)	2.22 (0.660)	2.20 (0.568)
Kellgren-Lawrence Grade, n (%)	1	6 (13.0)	6 (13.3)	11 (23.9)	4 (8.7)	27 (14.8)
	2	13 (28.3)	5 (11.1)	11 (23.9)	9 (19.6)	38 (20.8)
	3	21 (45.7)	24 (53.3)	15 (32.6)	23 (50.0)	83 (45.4)
	4	6 (13.0)	10 (22.2)	9 (19.6)	10 (21.7)	35 (19.1)

PRIMARY ENDPOINT: WOMAC-A – CFBL AT 12 WEEKS

Figure 14.2.1.2.1I: Box Plots of Change from Baseline of WOMAC-A Score up to Week 12
Modified Intent-to-Treat Population



UBX0101_MUS_201 PLACEBO RESPONSE VS. HISTORICAL REPORTS



90% CI

Placebo Response in UBX0101_MUS_201

Data from J. Mandema, Certara

Thank you

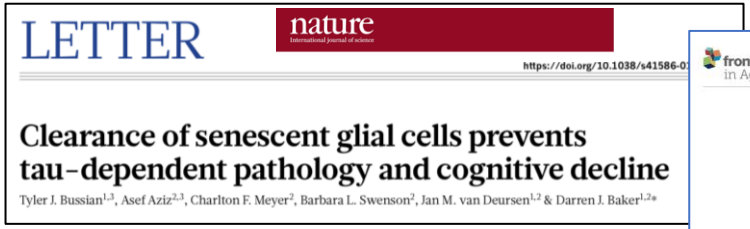
We would like to thank the UBX0101 team, and the clinicians, patients and caregivers who participated in the UBX0101 Phase 2 Study

UNITY PATH FORWARD AND PIPELINE EVOLUTION

Anirvan Ghosh, CEO

UNITY BIOTECHNOLOGY

STRONG EVIDENCE LINKING SENESCENT CELLS TO DISEASES OF AGING



LETTER

nature

Clearance of senescent glial cells prevents tau-dependent pathology and cognitive decline

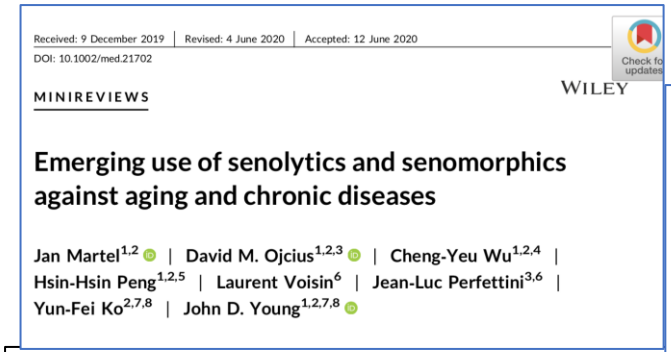
Tyler J. Bussian[1,3], Asef Aziz[2,3], Charlton F. Meyer[2], Barbara L. Swenson[2], Jan M. van Deursen[1,2] & Darren J. Baker[1,2]*

frontiers in Aging Neuroscience

REVIEW

Astrocyte Senescence and Alzheimer's Disease: A Review

Xiaojuan Han, Tianying Zhang, Huanhuan Liu, Yajing Mi* and Xingchun Gou*



Received: 9 December 2019 | Revised: 4 June 2020 | Accepted: 12 June 2020

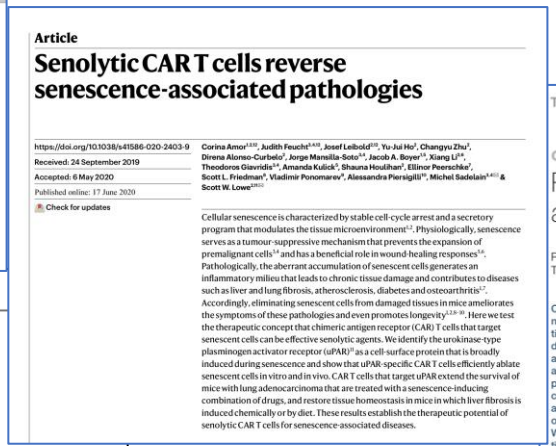
DOI: 10.1002/med.21702

WILEY

MINIREVIEWS

Emerging use of senolytics and senomorphics against aging and chronic diseases

Jan Martel[1,2] | David M. Ojcius[1,2,3] | Cheng-Yeu Wu[1,2,4] | Hsin-Hsin Peng[1,2,5] | Laurent Voisin[6] | Jean-Luc Perfettini[3,6] | Yun-Fei Ko[2,7,8] | John D. Young[1,2,7,8]



Article

Senolytic CAR T cells reverse senescence-associated pathologies

https://doi.org/10.1038/s41586-020-2403-9

Received: 24 September 2019

Accepted: 6 May 2020

Published online: 17 June 2020

Check for updates

Corina Amor[1,2,3], Judith Feucht[4,5,6], Josef Leibold[2,3], Yu-Jui Ho[1], Changyu Zhu[1], Direna Alonso-Curbelo[7], Jorge Mansilla-Soto[5,6], Jacob A. Boyer[5,6], Xiang Li[5,6], Theodoros Giavridis[5,6], Amanda Kulick[5], Shauna Houlihan[5], Ellinor Peerschke[5], Scott L. Friedman[8], Vladimir Ponomarev[9], Alessandra Piersigilli[10], Michel Sadelain[4,6,11] & Scott W. Lowe[2,12]

Cellular senescence is characterized by stable cell-cycle arrest and a secretory program that modulates the tissue microenvironment[1,2]. Physiologically, senescence serves as a tumour-suppressive mechanism that prevents the expansion of premalignant cells[3,4] and has a beneficial role in wound-healing responses[5,6]. Pathologically, the aberrant accumulation of senescent cells generates an inflammatory milieu that leads to chronic tissue damage and contributes to diseases such as liver and lung fibrosis, atherosclerosis, diabetes and osteoarthritis[7–9]. Accordingly, eliminating senescent cells from damaged tissues in mice ameliorates the symptoms of these pathologies and even promotes longevity[1,2,9–11]. Here we test the therapeutic concept that chimeric antigen receptor (CAR) T cells that target senescent cells can be effective senolytic agents. We identify the urokinase-type plasminogen activator receptor (uPAR)[11] as a cell-surface protein that is broadly induced during senescence and show that uPAR-specific CAR T cells efficiently ablate senescent cells in vitro and in vivo. CAR T cells that target uPAR extend the survival of mice with lung adenocarcinoma that are treated with a senescence-inducing combination of drugs, and restore tissue homeostasis in mice in which liver fibrosis is induced chemically or by diet. These results establish the therapeutic potential of senolytic CAR T cells for senescence-associated diseases.

REVIEWS

Opinion

Reducing Senescent Cell Burden in Aging and Disease

Robert J. Pignolo,[1,*] João F. Passos,[1] Sundeep Khosla,[1] Tamara Tchkonia,[1] and James L. Kirkland[1]

Cellular senescence is a primary aging process and tumor suppressive mechanism characterized by irreversible growth arrest, apoptosis resistance, production of a senescence-associated secretory phenotype (SASP), mitochondrial dysfunction, and alterations in DNA and chromatin. In preclinical aging models, accumulation of senescent cells is associated with multiple chronic diseases and disorders, geriatric syndromes, multimorbidity, and accelerated aging phenotypes. In animals, genetic and pharmacologic reduction of senescent cell burden results in the prevention, delay, and/or alleviation of a variety of aging-related diseases and sequelae. Early clinical trials have thus far focused on safety and target engagement of senolytic agents that clear senescent cells. We hypothesize that these pharmacologic interventions may have transformative effects on geriatric medicine.

Highlights

Accumulation of senescent cells is a fundamental aging process that contributes to age-onset disease, compromises health-span, and shortens life-span.

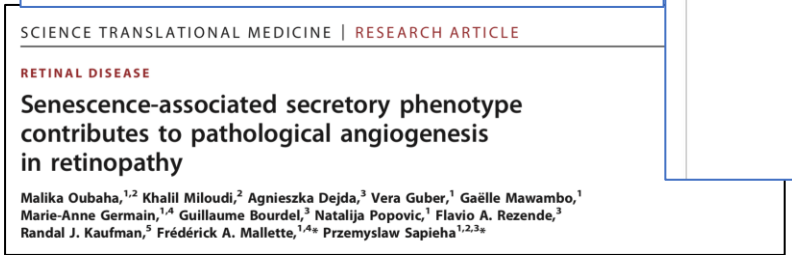
Senescent cells have been cleared genetically in animal models and pharmacologically in animals and humans.

Reduction in senescent cell burden can be accomplished pharmacologically by targeting antiapoptotic networks or SASP.

Early, proof-of-principle pilot clinical studies on senolytic agents are addressing safety and target engagement.

Targeting Cellular Senescence as an Intervention in Primary Aging

Cellular and molecular processes that account for primary aging include chronic, low-grade,

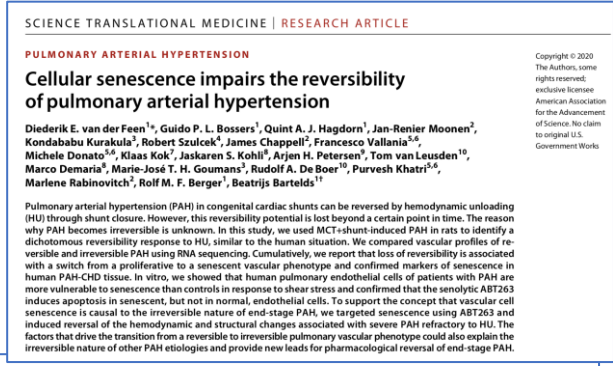


SCIENCE TRANSLATIONAL MEDICINE | RESEARCH ARTICLE

RETINAL DISEASE

Senescence-associated secretory phenotype contributes to pathological angiogenesis in retinopathy

Malika Oubaha,[1,2] Khalil Miloudi,[2] Agnieszka Dejda,[3] Vera Guber,[1] Gaëlle Mawambo,[1] Marie-Anne Germain,[1,4] Guillaume Bourdel,[3] Natalija Popovic,[1] Flavio A. Rezende,[3] Randal J. Kaufman,[5] Frédérick A. Mallette,[1,4]* Przemyslaw Sapieha[1,2,3]*



SCIENCE TRANSLATIONAL MEDICINE | RESEARCH ARTICLE

PULMONARY ARTERIAL HYPERTENSION

Cellular senescence impairs the reversibility of pulmonary arterial hypertension

Diederik E. van der Feen[1]*, Guido P. L. Bossers[1], Quint A. J. Hagdorn[1], Jan-Renier Moonen[2], Kondababu Kurakula[3], Robert Szulcek[4], James Chappell[2], Francesco Vallania[5,6], Michele Donato[5,6], Klaas Kok[7], Jaskaren S. Kohli[8], Arjen H. Petersen[9], Tom van Leusden[10], Marco Demaria[8], Marie-José T. H. Goumans[3], Rudolf A. De Boer[10], Purvesh Khatri[5,6], Marlene Rabinovitch[2], Rolf M. F. Berger[1], Beatrijs Bartelds[1]†

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Pulmonary arterial hypertension (PAH) in congenital cardiac shunts can be reversed by hemodynamic unloading (HU) through shunt closure. However, this reversibility potential is lost beyond a certain point in time. The reason why PAH becomes irreversible is unknown. In this study, we used MCT+shunt-induced PAH in rats to identify a dichotomous reversibility response to HU, similar to the human situation. We compared vascular profiles of reversible and irreversible PAH using RNA sequencing. Cumulatively, we report that loss of reversibility is associated with a switch from a proliferative to a senescent vascular phenotype and confirmed markers of senescence in human PAH-CHD tissue. In vitro, we showed that human pulmonary endothelial cells of patients with PAH are more vulnerable to senescence than controls in response to shear stress and confirmed that the senolytic ABT263 induces apoptosis in senescent, but not in normal, endothelial cells. To support the concept that vascular cell senescence is causal to the irreversible nature of end-stage PAH, we targeted senescence using ABT263 and induced reversal of the hemodynamic and structural changes associated with severe PAH refractory to HU. The factors that drive the transition from a reversible to irreversible pulmonary vascular phenotype could also explain the irreversible nature of other PAH etiologies and provide new leads for pharmacological reversal of end-stage PAH.

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DOI: 10.1096/fj.201900218R

RESEARCH ARTICLE

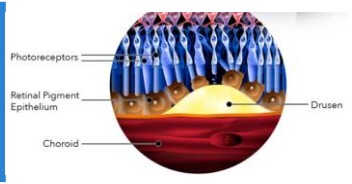
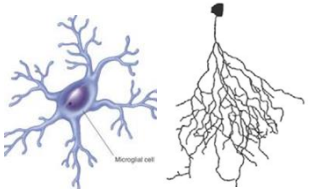
FASEB JOURNAL

Senescence-associated secretory phenotype promotes chronic ocular graft-vs-host disease in mice and humans

Mio Yamane[1] | Shinri Sato[1] | Eisuke Shimizu[1] | Shinsuke Shibata[2] | Motoshi Hayano[1] | Tomonori Yaguchi[3] | Hajime Kamijuku[4] | Mamoru Ogawa[1] | Takanori Suzuki[1] | Shin Mukai[5] | Shigeto Shimmura[1] | Hideyuki Okano[6] | Tsutomu Takeuchi[7] | Yutaka Kawakami[3] | Yoko Ogawa[1] | Kazuo Tsubota[1]

ROLE OF SENESCENCE IN AGE-RELATED EYE DISEASE

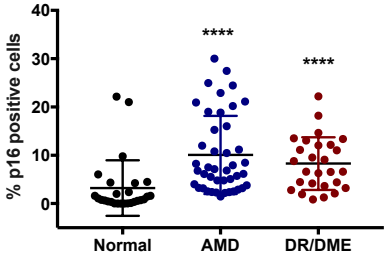
SnCs accumulate in the retina, potentially contributing to disease phenotypes

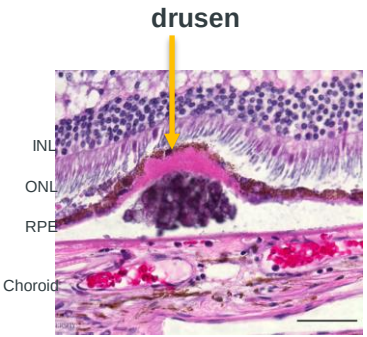
AMD		DR & DME
SnCs accumulate with with age in the retina retinal pigment epithelium (RPE) layer		**senescent cell**		**SnCs** accumulate in the retina with age & diabetic disease
SASP → choroidal remodeling & RPE dysfunction → atrophy	SASP FACTORS (VEGF-α, IP-10)	**senescence secretome**	SASP FACTORS (PAI-1, IL-6, IL-8, VEGF)	**SASP** → ocular inflammation, abnormal blood vessel growth
Disease → central vision loss		**disease symptoms**		**Disease** → vision loss

Oubaha et al., Senescence-associated secretory phenotype contributes to pathological angiogenesis in retinopathy, Sci. Transl. Med. 8, 362ra144 (2016)

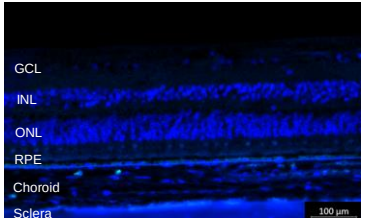
SENESCENCE BURDEN IN AMD AND DR/DME

SNC BURDEN

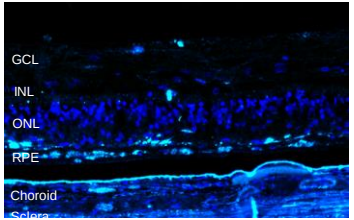




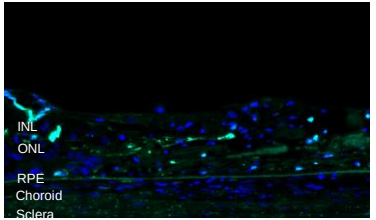
NORMAL (71F)



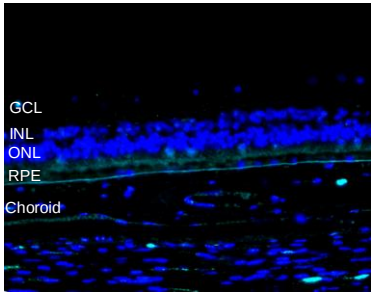
AMD (93M)

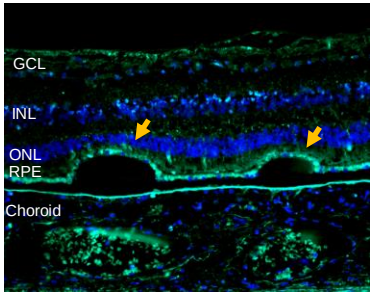


DR (64M)



INTERMEDIATE AMD (86F)





- Age-related eye diseases are multifactorial
- SnC burden increases with disease stage
- DR/DME patients show SnC in the retina and Choroid

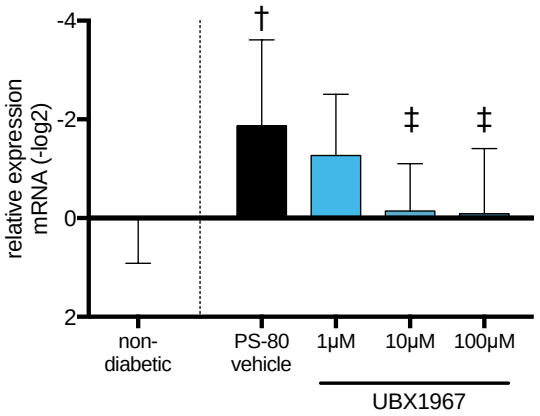
Unpublished UNITY Data

Faidley EA (2008)

OUR Bcl-xL INHIBITOR DEMONSTRATES EFFICACY IN MOUSE MODEL OF DIABETIC RETINOPATHY

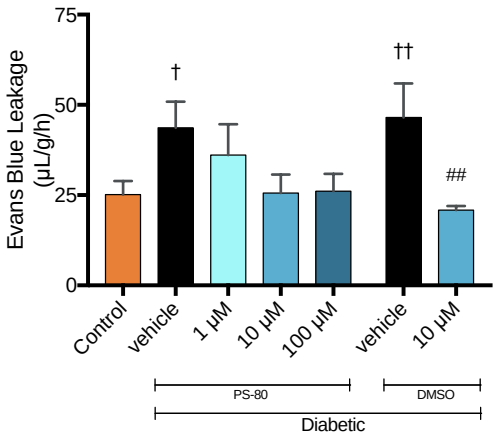
Streptozotocin (STZ) diabetic retinopathy model

IL1B



† p<0.05 v. non-diabetic control by two-tailed t-test;
‡ p<0.05 v. Vehicle; one-way ANOVA, with Dunnett's multiple comparison test

Vascular Leakage
UBX1967

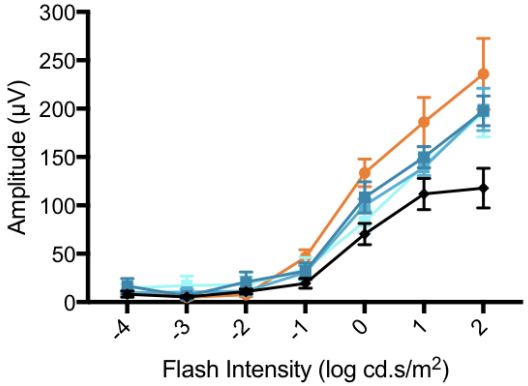


† p<0.05 v. Non-diabetic control by two-tailed t-test

†† p<0.01 v. Non-diabetic control by two-tailed t-test
p<0.01 v. DMSO control by two-tailed t-test

Effect on Photoreceptor Function

A-wave amplitude: week 10



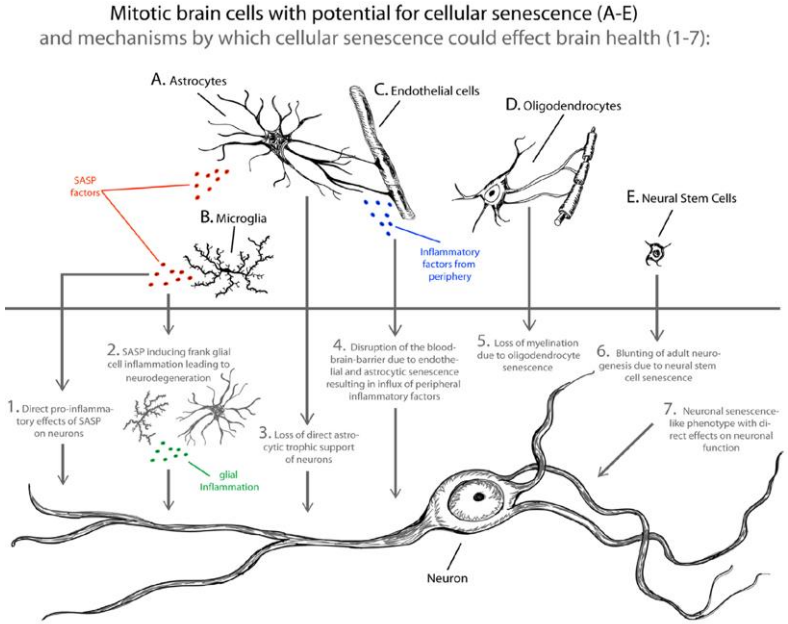
**** p<0.0001 v. Non-diabetic control; # p<0.05, ## p<0.01 v. Vehicle control by 2-way ANOVA with Tukey's multiple comparison test
No significant difference between Non-diabetic control and Unity treatment groups

Intravitreal dosing reduces SASP & vascular leakage and protects retinal function in diabetic mice

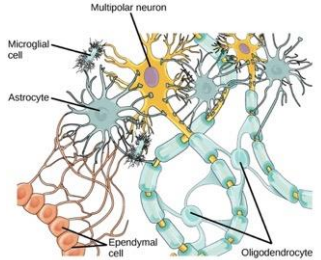
1 μM = ~1.7 ng of UBX1967

SENESCENCE DISEASE HYPOTHESIS IN THE BRAIN

SnCs accumulate in the brain, promote inflammation, and induce neurodegeneration



SnCs accumulate in aged & diseased brain



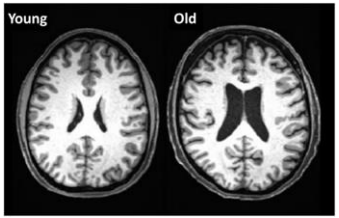
senescent glial cells

SASP → inflammation, impaired function, neurodegeneration

CYTOKINES, CHEMOKINES, SERPINS (e.g. IL6, IL1β, CCL11, PAI1)

senescence secretome

Disease → impaired cognitive & motor function, AD, PD, MS, ALS, HTT, CTE & TBI



disease symptoms

REFERENCE: Chinta et al., Cellular senescence and the aging brain, Exp Gerontol. 68:3-7 (2015)

UNITY PIPELINE

Pursuing indications with established endpoints and regulatory pathways

	MECHANISM	INDICATION	RESEARCH	LEAD OPTIMIZATION	IND-ENABLING	PHASE 1	PHASE 2	PHASE 3
MUSCULOSKELETAL	p53/MDM2 inhibition	Osteoarthritis	UBX0101					
OPHTHALMOLOGY	Bcl-xL Inhibition	AMD, Diabetic Macular Edema, Diabetic Retinopathy	UBX1325 / UBX1967					
	Multiple Mechanisms							
NEUROLOGY	Multiple mechanisms	Neurodegenerative, Cognitive disorders						

FINANCIAL METRICS AND MILESTONES

Lynne Sullivan, CFO

UNITY BIOTECHNOLOGY

FINANCIAL METRICS AND MILESTONES

- $112 million cash and cash equivalents as of June 30, 2020, excluding Hercules debt facility
- We took down the first tranche of Hercules debt of $25M upon closing in August 2020
- We do not intend to advance UBX0101 into pivotal studies which will extend our cash runway
- We will focus on capital allocation to extend our cash runway well into 2022, thus enabling initial proof-of-concept on UBX1325

MILESTONES

- 2H 2020 – Ph 2 24-week data & Ph 1b 12 and 24-week expected from UBX0101
  - Data to be shared at a scientific meeting (immaterial costs to complete)
- 2H 2020 – anticipate entering the clinic with UBX1325
- To enable multiple indications (e.g., DME, DR, AMD)
- Initial data expected 2021

Q&A

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