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INVESTING IN THE AGE OF LONGEVITY

LONGEVITY WEEK 2021

Sponsored by

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WELCOME

Hello and welcome to Investing in the Age of Longevity.

It has been a tumultuous two years since we were last able to hold this event in person. Those two years have placed an unprecedented spotlight on the power of medical science to change lives and support the social and economic health of entire nation states, not to mention the health of billions of individuals. Many of us have become amateur virologists and immunologists in that time, but I'm pleased to say that today we are graced by the professionals.

While economic recovery has so far been patchy and uneven, the Life Sciences industry as a whole, and the field of Gerontology in particular, have emerged stronger than ever with significant strides being taken in research, organisation and investment. I'm very pleased to say that many of those strides are represented by our line-up of speakers today.

Investing in the Age of Longevity is of course part of Longevity Week, which is held from 15-19 November. With COP26 concluding just a few days ago, Longevity Week's theme is aptly dubbed 'Sustainability in a Decade of Healthy Aging'. As today's speakers will address, a longer lifespan might feel like a hollow achievement if it doesn't also address the aspect of healthspan. Keeping people fit and active for longer is an integral component of successful longevity. For those companies who succeed in supporting this goal, a prosperous future awaits.

I should take this opportunity to thank our sponsors and partners, without whom this event simply would not be possible. In particular, I would like to thank Juvenescence, First Longevity and the American Federation of Aging Research.

I hope that you will find today a useful and inspiring day, one that helps to explain the science which underpins this nascent but rapidly growing industry while providing ideas on potential investments.

Best regards,

Tim Corcoran
CEO, Master Investor

PROGRAMME

TIME	SESSION / TALK	SPEAKER
09:00-09:25	**Registration**	
	Science	
09:30-09:40	Welcome remarks	Phil Newman *CEO, First Longevity*
09:40-10:00	**The Geroscience Promise: The Biology of Age-Related Disease and The Potential of Therapeutic Interventions** Over the last decade, a quiet research revolution has occurred in our understanding of the biology of ageing. This has seen the emergence of the geroscience hypothesis- that core biological ageing processes underpin multiple phenotypes and diseases of ageing, and discovery of some fundamental biological mechanisms that control healthspan and lifespan in experimental animals. These advances have led to interventions that have already reached early-stage human clinical trials for chronic age-related diseases. The challenge is to turn this knowledge into advice and treatments that everyone can use and benefit from. Doing so will unlock a "longevity industry" valued at over $100 trillion whilst saving similar amounts in health care costs. In this talk Richard Faragher will introduce the new science of ageing, explain the opportunities that it affords us and describe the barriers we must overcome to achieve healthier, happier and longer lives.	Richard Faragher *AFAR Board Member, University of Brighton*
10:00-10:20	**The aged immune system – a central driver of ageing** The immune system plays a key role in maintaining health, protecting from infections and cancer but also removing damaged and aged cells. Importantly recent studies in mice have shown that an aged immune system is by itself able to induce an aged, multimorbid phenotype. Professor Lord will describe some of the key changes that occur to the immune system with advancing age and how this impacts upon many aspects of health in old age. She will discuss how targeting the processes that compromise the immune system has benefits for common infections such as pneumonia, can improve vaccination responses, but also holds promise for reducing the overall ageing process.	Janet Lord *Director, Institute for Inflammation and Ageing, University of Birmingham*
10:20-10:40	**Senolytics** Senescent cells, which arise in response to stress or damage, do not divide yet remain alive and are normally removed by the immune system. Cellular senescence can be beneficial, acting against cancer and	James L. Kirkland *AFAR President, Director, Robert and Arlene Kogod Center on Aging, Mayo Clinic*

TIME	SESSION / TALK	SPEAKER
	assisting in tissue repair and remodelling. However, if senescent cells persist, they can contribute to age-related dysfunction and multiple diseases, even in children. Senolytics are drugs that selectively eliminate senescent cells by transiently disabling the pathways senescent cells use to defend themselves against the factors they release that destroy cells around them, causing damaging senescent cells to "commit suicide". From evidence using in vitro models and animals, senolytics appear to have potential for delaying, preventing, or alleviating dozens of diseases and disorders, including dementias, frailty, diabetes, obesity, and infections such as COVID, diseases of the kidneys, lungs, liver, heart, skin, intestines, eye, and skeleton, and improving outcomes after chemotherapy, radiation, immunization, surgery, and organ transplantation. In early results from clinical trials, senolytics appear to eliminate senescent cells in humans and cause few adverse events. Multiple clinical trials of senolytics are currently underway for a range of indications.	
10:40-11:00	**Prometheus Unbound: From Myth to the Clinical Reality of Organ Regeneration** LyGenesis combines its cell therapies with the lymph node's innate ability to act as a bioreactor to vascularize cells, enabling the development of fully functioning ectopic organs. This process of organogenesis has evolved from academic discovery to a Phase 2a clinical trial for patients with end stage liver disease.	Michael Hufford *CEO and Co-founder, LyGenesis*
11:00-11:25	Coffee	
	Investment	
11:25-11:30	Welcome back	Phil Newman
11:30-11:50	**Cambrian Bio - Creating longevity drugs at scale** Cambrian Bio has forged alliances with more than a dozen top research institutions and raised more than $150M to create a pipeline of drugs that enhance human healthspan. Let's discuss what longevity drugs are and how to get them to people to help them live longer and healthier.	James Peyer *CEO and Co-Founder, Cambrian Biopharma*
11:50-12:10	**Juvenescence: Re-imagine a Lifetime** Juvenescence is the most diversified biotech company focused exclusively on healthy aging. Our mission is to inspire and equip the world to reimagine a lifetime.	Greg Bailey *CEO, Juvenescence*

TIME	SESSION / TALK	SPEAKER
	Today, people are starting new careers in their 50's, having kids later, and enjoying life longer. However, bias persists everywhere. To many, aging means the inevitable decline in health and one's value to society. The tides are turning. Science and technology are making breakthroughs in human healthspan. Juvenescence has brought together a coalition of the best scientists, physicians and investors. Our goal: to deliver cutting-edge therapies and products that will disrupt how we age, think and behave. There are three pillars to this change. The first: we are entering a moment where we can modify aging based on insights into how cells age, the role of genes and proteins in human health and aging. For the first time, scientists are stimulating the body to regenerate healthier tissues and organs. The second pillar changes our current healthcare model. Today, the system treats disease after people get sick. The new ecosystem will develop therapies to prevent these same pathologies and disease states. It's a permanent shift from the sick-treat paradigm. The final pillar democratizes these important advances. We'll harness clinically-validated but more economically available therapies, such as supplements, and leverage social media to connect directly with the people who need them. People will be empowered to make lifestyle changes, to take advantage of transformative therapies to live longer and healthier.	
12:10-12:30	**Q&A Panel** Phil Newman poses questions to Greg Bailey, CEO, Juvenescence and James Peyer, CEO and Co-Founder, Cambrian Biopharma.	Phil Newman Greg Bailey James Peyer
12:30-12:50	**We love longevity, but my heart's in healthspan** Modern diets and lifestyles are leading to record highs of non-communicable chronic disease. In the UK we spend over 20% of our lifetime in ill health. That's just not good enough. The technology and evidence-base now exist to provide truly personalised interventions not just to help people feel better today, but also to prevent chronic disease tomorrow.	Dr Geoff Mullan *Founder, humanpeople*

TIME	SESSION / TALK	SPEAKER
12:50-13:45	Lunch	
	Showcase	
13:45-13:50	Afternoon introduction	Phil Newman
13:50-14:10	**A path to safe cellular rejuvenation** Cell reprogramming offers a path to comprehensive rejuvenation but has a goldilocks problem. Too little and you have no rejuvenation, too much and you risk cancer. To fulfil its potential, cell-reprogramming must be made safe. Based on a novel application of machine learning, Shift Bioscience has identified a means to tame cell reprogramming and safely reset cells and tissues back to a youthful state, mitigating the diseases of ageing.	Daniel Ives *CEO and Founder, Shift Bioscience*
14:10-14:30	**Crossing the chasm: priming the market for longevity interventions** The growth in longevity research, investment, clinical progress, and market-ready products is driving the market toward increasing levels of awareness and adoption. The role that communication plays is crucial in both business and consumer domains: for investors looking to understand the longevity opportunity and make sound investment decisions; for clinicians to shift their focus from fixing disease to prevention; for consumers to migrate their thinking from wellness toward longevity.	George Sutherland *Non-Exec Chairman, First Longevity*
14:30-14:50	**A Healthy Brain for Life** Mitocholine is the novel generation of bioactive cellular metabolites designed to support and optimise cellular metabolism and energy production to sustain cognitive health and vitality throughout life. Mitocholine is first CNS penetrable formulation applicable for development in therapeutic benefit areas and in general consumer health. Mitocholine is currently being developed as a novel food fortification ingredient to maintain healthy brain metabolism. Mitocholine is a result of two decades of global scientific research. The concept is based on the multitargeted approach. Mitocholine works in synergistic way to enhance and maintain the energy production by mitochondria in the brain cells and optimises glucose utilisation by supporting insulin response. The product is trademarked Mitocholine and a global proprietary position has been secured, protecting its usage	Larisa Andreeva *CEO, Mitocholine Ltd*

TIME	SESSION / TALK	SPEAKER
	and applications. Mitocholine is currently pre-sales with a significant part of the R&D development and regulatory approvals requirements completed. Our ambition with Mitocholine is to make it as widely available as possible so that it can have the greatest impact on our health and wellbeing. Round A is required to introduce Mitocholine to the market as Food for Special Medical Purpose by conducting the clinical trials in patients suffering from Mild Cognitive Impairment. Moreover, the novel food regulatory approval gives us the possibility to build the business model based on partnerships with industrial consumer goods producers that have strong branded positions in each of the product categories described above and who are interested in adding Mitocholine as an ingredient to either existing or new affordable brands in their portfolio to offer the widest consumer reach. We will rely on our partner to either establish a new functional beverage brand containing Mitocholine or to fortify an existing brand in their portfolio with Mitocholine. These companies will have the best capability of generating widespread availability across market geographies as quickly as possible. Strategic players in the food nutrition market, and potential distribution partners in the beverage distribution market are expressing interest in Mitocholine as a breakthrough product to tackle a major global problem of keeping the healthy human brain for longer.	
14:50-15:15	Coffee	
	The Future	
15:15-15:20	Welcome back	Phil Newman
15:20-15:50	**AFAR Think Tank Reports Finding** Collaborations between federal agencies, research institutions, and geroscience investors are driving the evolution of biomedical research to extend healthspan. Recently, the American Federation for Aging Research (AFAR) convened a series of invite-only, cross-sector think tanks to discuss the path to future success. Together, scientists, entrepreneurs, and executives deliberated: how to continue to support basic science and geroscience, how to improve access and engagement between private biotech companies and public research institutions, and how to build the pipeline for translational and pre-clinical science.	Richard Faragher

PROGRAMME

TIME	SESSION / TALK	SPEAKER
	AFAR Board Member Professor Richard Faragher, PhD, will share key findings from the Think Tanks and invite feedback on next steps globally.	
15:50-16:20	**Targeting Aging with Metformin (TAME): A Concrete Plan to Pave the Way for Targeting Aging** Metformin appears to show promise as a general-purpose geroprotector, or guard against many of the known mechanisms of aging. TAME is a pioneering trial that would demonstrate Metformin's ability to slow aging processes in general and pave the way for drugs that treat aging itself as opposed to its effects.	Nir Barzilai *AFAR Scientific Director* *Director of the Institute for Aging Research, Albert Einstein College of Medicine*
16:20-16:50	**Rejuvenating and uniting the industry to target health span and life span**	Jim Mellon *Host speaker* James Peyer Mehmood Khan *Executive Chairman, Life Biosciences Inc.* Kristen Fortney *Co-Founder, CEO, BioAge Labs, Inc.*
16:50-16:55	Closing Remarks	Phil Newman
17:00	**Close**	

SPEAKERS

Larisa Andreeva

Larisa is a biochemist by training and was awarded PhD scholarship by the Russian Academy of sciences on graduation of St Petersburg University. The PhD thesis was presented on the first British-Russian Neurological Conference followed by the invitation from Sandoz Institute for Medical Research in London for a Post-Doctoral position. Since then, Larisa held several senior academic research positions in London studying mitochondrial bioenergetics and cellular metabolic regulation.

From 2008 Larisa was responsible for the Intellectual Property (IP) commercial development and exploitation for the academic research organisations UCL and Imperial College in London. The expertise was in competitive intelligence, market research, strategic planning, commissioning studies to contract research organizations and academic laboratories and business development. Larisa came across Dr Igor Pomytkin's invention researching the patent database in 2014 and Mitocholine Ltd was established in the same year and Larisa has been the CEO of the company since then. Larisa raised seed financing and non-dilutive funding from Innovate UK. Larisa overseen Mitocholine™ technology and prototype being developed, a global patent position secured, protecting its usage and applications as well as achieving global regulatory approvals for the Mitocholine composition.

Greg Bailey

Greg Bailey, a physician and financier, is co-founder and CEO of Juvenescence. The company aims to solve the problem of human aging by investing in technologies and treatments that are most likely to extend human lifespans and deliver high returns to shareholders.

Greg is a serial entrepreneur in biotech and also serves as chairman of Portage Biotech, a publicly-traded oncology drug development company. Previously, he has been managing partner at Palantir Group, director at Medivation, and board member at Biohaven Pharmaceuticals Holding Company.

Nir Barzilai

Dr. Barzilai is a chaired Professor of Medicine and Genetics and Director of the biggest Center in the world to study the Biology of Aging. He is the recipient of an NIH Merit Award aiming to extend the healthy life span in rodents by biological interventions. He also studies families of centenarians that have provided genetic/biological insights on the protection against aging. Several drugs are developed based, in part, on these paradigm-changing studies. He is a recipient of numerous prestigious awards, including the recipient of the 2010 Irving S. Wright Award of Distinction in Aging Research and is the 2018 recipient of the IPSEN Longevity award.

He is leading the TAME (Targeting/Taming Aging with Metformin) multi central study to prove that concept that multi morbidities of aging can be delayed in humans and change the FDA indications to allow for next generation interventions. He is a founder of CohBar Inc. (now public company) and Medical Advisor for Life Biosciences. He is on the board of AFAR and CohBar He has been featured in major papers, TV program and documentaries (TEDx and TEDMED) and has been consulting or presented the promise for targeting aging at The Singapore Prime Minister Office, several International Banks, The Vatican, Pepsico, Milkin Institute, The Economist and Wired Magazine.

Richard Faragher

Richard Faragher is Professor of Biological Gerontology at the University of Brighton and is past Chair of the British Society for Research on Ageing, the International Association of Biomedical Gerontology and the American Aging Association. He read Biochemistry at Imperial College, London and undertook doctoral studies on human premature ageing at the University of Sussex. His primary research interest is the relationship between cellular senescence and organismal ageing.

He holds the Royal Pharmaceutical Society Conference Science Medal for his work on the mechanisms of Werner's syndrome, the Help the Aged 'Living Legend' award for his championship of older people, the Paul F Glenn Award for research into the mechanisms of ageing and the British Society for Research on Ageing's highest honour, the Lord Cohen of Birkenhead Medal. He is a Fellow of the American Aging Association and serves on the Editorial Boards of Advances in Biogerontology, Mechanisms of Aging and Development and Biogerontology.

Professor Faragher has served as a member of the Research Advisory Council of the Charity Research into Ageing and on strategy and funding panels for the BBSRC, the US National Institutes on Ageing and the European Union. From 2005-2008 he was Co-director of the BBSRC-EPSRC SPARC programme, a research network designed

to build national capacity to conduct inter-disciplinary ageing research. He is currently a Director of the American Federation for Aging Research, the leading US non-profit organization supporting and advancing healthy aging through biomedical research and serves on the Scientific Advisory Board of the Longevity Vision Fund an investment fund dedicated to making longevity affordable and accessible to all.

Michael Hufford

Dr. Michael Hufford, PhD is co-founder and CEO of LyGenesis, a biotechnology company focused on organ regeneration.

"Our cellular therapies enable patients' lymph nodes to be used as bioreactors to regrow functioning ectopic 'mini-organs' that support or replace the functioning of the diseased originals."

LyGenesis's lead program in liver regeneration is preparing to transition into clinical development, beginning with a Phase 2 clinical trial for patients with end stage liver disease.

Dr. Hufford is an entrepreneur and drug developer with more than 20 years of experience developing small molecules (Cypress Bioscience), biologics (Amylin Pharmaceuticals), as well as drug delivery technologies (e-Nicotine Technology).

He has also consulted extensively to drug development programs in a wide variety of therapeutic areas, spanning clinical trial design (invivodata, NeuroCog Trials, PinneyAssociates), patient-reported outcomes (invivodata), neuropsychological outcomes (NeuroCog Trials), and prescription to over-the-counter (OTC) switch programs (PinneyAssociates).

Dr. Hufford also co-founded and is the CEO of Harm Reduction Therapeutics, a non-profit pharmaceutical company focused on preventing opioid overdose deaths bringing a low-cost naloxone product to the OTC market. He earned his undergraduate degree from Purdue University, and his master's and doctoral degrees in clinical psychology from the University of Pittsburgh before completing a Research and Clinical Fellowship in the Department of Psychiatry at Harvard Medical School.

Daniel Ives

At Shift Bioscience, Daniel is making drugs for safe cellular rejuvenation and mitigation of age-linked diseases through the application of machine-learning to cellular reprogramming. Daniel is also a founding fellow of the OnDeck Longevity Biotech fellowship, a continuous community for people to come together to build, join, or invest in revolutionary longevity biotechnology startups.

Mehmood Khan

Mehmood Khan, is the Chief Executive Officer of Hevolution Foundation, a first of its kind non-profit organization that funds research through grants and provides investments in biotech to incentivize healthspan science across disciplines and borders for the benefit of all. Established by a Saudi Royal Decree with its headquarters in Riyadh with additional international hubs to support the expansion and execute the global mission. Its vision is to expand healthy human lifespan for the benefit of all humanity. Hevolution Foundation aims to be positioned as a global leader, catalyst, partner, and convener, to increase the number of scientists entering the field, to increase the investable opportunities in the field of aging, to help shape the regulatory and government environment.

He also currently serves as the Executive Chairman of Life Biosciences Inc. where he joined the company in April 2019 as the Chief Executive Officer and Board Member. LifeBiosciences was founded to advance scientific research and develop innovative new therapies to improve and extend healthy lives for everyone.

Dr. Khan previously served as Vice Chairman and Chief Scientific Officer of Global Research and Development at PepsiCo, a Fortune 50 company employing upwards of 250,000 employees across 22 brands. At PepsiCo, Dr. Khan played a pivotal role in the company's global R&D efforts to create breakthrough innovations in food, beverages, and nutrition, including the incorporation of healthier and more nutritious offerings across its portfolio. Dr. Khan also oversaw PepsiCo's global sustainability initiatives based on the belief that success in business is inextricably linked to the sustainability of the world we share. Prior to joining PepsiCo, Dr. Khan served as President of Global R&D at Takeda Pharmaceuticals, leading the global efforts of one of the largest pharmaceutical companies in the world by revenue.

Before moving into industry, Dr. Khan had a distinguished medical career as a faculty member in endocrinology at the Mayo Clinic and Mayo Medical School where he served as Director of the Diabetes, Endocrine and Nutritional Trials Unit. He also spent nine years leading programs in diabetes, endocrinology, metabolism and nutrition in Minneapolis, MN.

Dr. Khan is currently a member of the Board of Directors of Reckitt Benckiser, member of the Visiting Committee on Advanced Technology (VCAT) of the United States' National Institute of Science and Technology (NIST), and Lahore University of Management Sciences (LUMS).

Dr. Khan has also served as a Board member in Spectrum Health, CorMedix, HemoShear Therapeutics, Indigo Agriculture USDA Research, and chairman of the US Council of Competitiveness.

Dr. Khan earned his medical degree from the University of Liverpool Medical School, England, and completed a fellowship in clinical endocrinology and nutrition in the Department of Medicine and Food Science and Nutrition at the University of Minnesota, Minneapolis. He is a Fellow of the Royal College of Physicians in London and a Fellow of the American College of Endocrinology.

James L. Kirkland

James L. Kirkland, MD, PhD is the Director of the Robert and Arlene Kogod Center on Aging at Mayo Clinic and Noaber Foundation Professor of Aging Research. Dr. Kirkland's research focuses on cellular senescence, age-related adipose tissue and metabolic dysfunction, and development of agents and strategies for targeting fundamental aging mechanisms to treat age-related chronic diseases and disabilities and to extend healthspan. He published the first article about drugs that clear senescent cells / senolytic agents.

A novel, mechanism-based, hypothesis-driven drug development paradigm was used to discover senolytic drugs. Based on the observation that senescent cells release factors that cause apoptosis of the cells around them, yet are themselves resistant to apoptosis, Dr. Kirkland hypothesized that senescent cells utilize senescent cell anti-apoptotic pathways (SCAPs) for protection from their own senescence-associated secretory phenotype (SASP). Using bioinformatics analyses of senescent vs. non-senescent cells and RNA interference, Dr. Kirkland identified these SCAPs and verified their importance for senescent cell survival. Dr. Kirkland used bioinformatics approaches to identify agents that target key nodes across the SCAP network and demonstrated these drugs are senolytic in rodent and human cultured cells and mice in vivo, These senolytic drugs include Dasatinib (D), Quercetin (Q), Fisetin, Navitoclax, and related compounds.

Dr. Kirkland showed these agents delay, prevent, or alleviate multiple disorders in mouse models of human chronic diseases and aging phenotypes. Conditions alleviated in mouse models include frailty, diabetes, hepatic steatosis, cirrhosis, renal dysfunction, neuropsychiatric disorders, dementias, pulmonary fibrosis, osteoporosis, osteoarthritis, retinal degeneration, diastolic dysfunction, cardiac ischemia, vascular hyporeactivity, infertility, and skin disorders, among others. He demonstrated that intermittent, orally administered senolytics reduce senescent cell abundance in adipose tissue and blood markers of senescent cell burden in blood of patients with diabetic kidney disease. He and collaborators found that a brief course of senolytics enhances physical function and reduces frailty in patients with idiopathic pulmonary fibrosis, a fatal, cellular-senescence-driven disease for which available treatments have been unsatisfactory. Multiple clinical trials are currently underway of the senolytics that Dr. Kirkland discovered.

He is a scientific advisory board member for several companies and academic organizations. In addition to being President of AFAR, he has been a member of the National Advisory Council on Aging of the National Institutes of Health, and past chair of the Biological Sciences Section of the Gerontological Society of America. He holds honorary appointments at Boston University and the University of Groningen in the Netherlands. He is a board-certified specialist in internal medicine, geriatrics, and endocrinology and metabolism.

Janet Lord

Janet Lord is Professor of Immune Cell Biology and Director of the Institute for Inflammation and Ageing at the University of Birmingham. She is also Director of the MRC-Versus Arthritis Centre for Musculoskeletal Ageing Research and theme lead for sarcopaenia in the NIHR Birmingham Biomedical Research Centre and leads the acute response to injury themes in the NIHR Surgical Reconstruction and Microbiology Research Centre and the Scar Free Foundation Centre for Burns Research.

Her primary research focus is on the effect of ageing upon immune function and how this limits the ability of older adults to resolve inflammation occurring in response to infectious challenge or injury. This has led her to research neutrophil function in healthy elders and also after hip fracture and during infections such as pneumonia. She also researches the link between chronic systemic inflammation and physical frailty in old age and has published papers showing that much of the increased systemic inflammation and sarcopaenia associated with ageing can be prevented by high levels of physical activity in adulthood.

Professor Lord has a particular interest in the role played by stress (physical and psychological) and the altered HPA axis in modulating immunity and frailty in old age and following an injury such as hip fracture.

She has published several papers showing that a heightened HPA axis (increased corti-sol:DHEAS ratio) is associated with poor outcomes after hip fracture.

In 2013 she was awarded the Lord Cohen of Birkenhead medal for her outstanding research in human ageing by the British Society for Research in to Ageing. She was elected a Fellow of the Academy of Medical Sciences in 2015. She has published over 200 original papers and reviews.

Jim Mellon

Jim Mellon is an entrepreneur with a flair for identifying emerging global trends enabling him to build a worldwide business empire. He is amongst the top 10% in the "Sunday Times Rich List" (Britain's equivalent to the Forbes list). He is often described as the British Warren Buffett and he predicted the Credit Crunch of 2007-08 in a book entitled "Wake Up! Survive and Prosper in the Coming Economic Turmoil". Jim followed this with "The Top 10 Investments for the Next 10 Years" (2008) and subsequently "Cracking the Code" (2012), "Fast Forward" (2014) and, most recently, "Juvenescence" (2017). His monthly "Mellon on the Markets" column in Master Investor Magazine has gained him cult status among investors. He holds a master's degree in Politics, Philosophy and Economics from Oxford University. He is on the Board of Trustees of the Buck Institute in California, a trustee of the Biogerontology Institute, and a Fellow of Oriel College, Oxford.

Dr Geoff Mullan

Dr Geoff Mullan BSc MBBS MRCS DO-HNS. CEO and co-founder of humanpeople. Dr Geoff Mullan is the CEO and co-founder of humanpeople, a CQC-regulated preventative health platform which helps fix everyday health issues and reduce the risk of chronic disease. As part of a distinguished career as a doctor he previously co-founded Medicetics, an award-winning skin and anti-ageing clinic, where he started to introduce the concept of nutrigenomics and healthy ageing before following a path into Functional Medicine and digital health. He is now obsessed with following the science and crunching the numbers to understand how to help people live healthier for longer. Geoff qualified in Medicine from King's College London and has a degree in Endocrinology, he left the NHS after qualifying as a surgeon in 2007.

Phil Newman

Phil Newman is Editor in Chief of www.Longevity.Technology, the key daily news platform for Longevity investment, research and new business.

As an international consultant for over 25 years Phil has delivered C-level management, marketing and business development expertise to start-ups, scale-ups and enterprises.

Market experience includes: Longevity; IoT; AI; Medical Devices; Biopharma; 3D Manufacturing; Smartgrid and Sustainability. He is the founder of First Longevity which operates 2 digital businesses in the field of Longevity, including Crowd Longevity: the digital platform for equity funding Longevity start-ups and scale-ups.

James Peyer

James Peyer is the Chief Executive Officer and Co-Founder of Cambrian Biopharma. He also serves as the Chairman of the Board of Sensei Biotherapeutics and board and executive roles across Cambrian's pipeline. He has spent his entire life dedicated to the mission of finding ways of preventing people from getting diseases like cancer and Alzheimer's instead of waiting for people to get sick. James was previously Founder and Managing Partner at Apollo Ventures, the first global longevity-focused venture capital firm, investing across the US and Europe. Prior to Apollo, James was a biotech R&D specialist at the New York office of McKinsey & Company, serving major pharmaceutical clients. He earned his PhD in stem cell biology at University of Texas Southwestern Medical Center as a National Science Foundation Fellow and received his B.A. with special honors from the University of Chicago.

George Sutherland

George Sutherland is a Fellow of the Institute of Directors (IOD) and has demonstrated many years of success working in fast-moving consumer goods (FMCG), Healthcare and Medical companies; Nabisco, Bristol Myers Squibb, Unilever, and Ansell.

From a Sales & Marketing background his experience includes personally managing business with most of the UK major retailers such as Sainsbury, Tesco, Boots and has over 30 years of expertise in dealing with the NHS and health markets. Having also gained experience in raising corporate finance, pre and post IPO, he now dedicates his time to working as a Non-Executive Chairman and NED for med-tech start-ups Trueinvivo and TestCard in addition to being Chairman of First Longevity.

COMPANIES

SPONSORS

Juvenescence

Juvenescence is the most diversified biotech company focused exclusively on healthy aging. Our mission is to inspire and equip the world to reimagine a lifetime.

JUVENESCENCE™

Today, people are starting new careers in their 50's, having kids later, and enjoying life longer. However, bias persists everywhere. To many, aging means the inevitable decline in health and one's value to society.

The tides are turning. Science and technology are making breakthroughs in human healthspan. Juvenescence has brought together a coalition of the best scientists, physicians and investors. Our goal: to deliver cutting-edge therapies and products that will disrupt how we age, think and behave.

There are three pillars to this change. The first: we are entering a moment where we can modify aging based on insights into how cells age, the role of genes and proteins in human health and aging. For the first time, scientists are stimulating the body to regenerate healthier tissues and organs.

The second pillar changes our current healthcare model. Today, the system treats disease after people get sick. The new ecosystem will develop therapies to prevent these same pathologies and disease states. It's a permanent shift from the sick-treat paradigm.

The final pillar democratizes these important advances. We'll harness clinically-validated but more economically available therapies, such as supplements, and leverage social media to connect directly with the people who need them.

People will be empowered to make lifestyle changes, to take advantage of transformative therapies to live longer and healthier.

www.juvenescence.ltd

First Longevity

First Longevity is a media and finance business centred in the middle of the growing longevity market.

FirstLongevity

We facilitate the further growth and development of the longevity market by supporting early stage and growth businesses through our unparalleled network of investors, advisory panel/board and our media platform: www.longevity.technology

First Longevity offers capital raising and advisory services to health and longevity businesses globally. Through investor introductions and advisory services, we help take businesses through Pre-seed to Series B financing.

www.firstlongevity.com

American Federation for Aging Research (AFAR)

The American Federation for Aging Research (AFAR) is a national non-profit organization that supports and advances pioneering biomedical research that is revolutionizing how we live healthier and longer. For four decades, AFAR has served as the field's talent incubator, providing more than $189 million to nearly 4,300 investigators at premier research institutions nationwide. A trusted leader and strategist, AFAR also works with public and private funders to steer high quality grant programs and interdisciplinary research networks. AFAR-funded researchers are finding that modifying basic cellular processes can delay – or even prevent – many chronic diseases, often at the same time. They are discovering that it is never too late – or too early – to improve health. This groundbreaking science is paving the way for innovative new therapies that promise to improve and extend our quality of life – at any age. Learn more at www.afar.org or follow AFARorg on Twitter and Facebook.

www.afar.org

Albert Einstein College of Medicine

Albert Einstein College of Medicine is a research-intensive medical school. For more than 60 years, our diverse faculty and staff have set the standard for excellence in medical and graduate education and patient-centered clinical care, and have made major contributions to scientific research enhancing human health in our communities and beyond. Our mission is to prepare a diverse body of students to become knowledgeable, compassionate physicians and innovative scientific investigators, and to create new knowledge.

www.einstein.yu.edu

Cambrian Biopharma

Cambrian Biopharma is a diversified R&D platform company built on a new model for drug discovery. We partner with leading academic institutions and biotech entrepreneurs all over the world to build start-up companies, providing capital and expertise to advance a pipeline of drug development programs with a shared theme. Cambrian is unique among biotech companies due to our focus on a specific field of scientific research: the basic biology of aging, also known as geroscience. Drugs that target the Nine Hallmarks of Aging can be exceptionally powerful medicines that could extend the healthiest years of life. Our approach is to build a pipeline that

cultivates multiple assets and takes a risk-based approach to drug development, maximizing the odds that Cambrian will create multiple life-changing therapeutics that receive regulatory approval.

www.cambrianbio.com

humanpeople

humanpeople is a CQC-regulated preventative health platform which helps fix everyday health issues and reduce the risk of chronic disease. Essentially humanpeople has put a specialist health clinic online, but has made it affordable, easy to use, and scalable. Measurable improvements in health are made possible by the integration of easy home diagnostic test kits (blood, DNA, gut microbiome) with an AI health assessment and medical and nutritional expertise based on the latest clinical research. All for less than a daily cup of coffee. humanpeople is operating in the intersection of four large and fast-growing markets: personalised health; preventative health; digital health; and supplements. The service launched commercially in mid-2021 after a successful 18 month pilot and is currently raising funds to invest in growth and to capitalise on early success.

https://humanpeople.co

LyGenesis

LyGenesis is a clinical-stage biotech company whose organ regeneration platform includes a pipeline of regenerative cell therapies. Born from 10 years of academic research at the McGowan Institute for Regenerative Medicine at the University of Pittsburgh's School of Medicine, and another two years of IND-enabling large animal preclinical work, LyGenesis is now starting their first clinical trial for patients with End Stage Liver Disease at the Massachusetts General Hospital at Harvard Medical School.

LyGenesis aims to retire organ transplant waiting lists to the dustbin of medical history along with iron lungs and mercury ointments. Using their platform technology one donated organ can potentially be used to treat dozens of patients, and their cell therapy involves engraftment via endoscopic ultrasound, a low-risk and cost-effective outpatient procedure.

For LyGenesis's liver program, they have been unable to get the technology NOT to work. Time and again, in small and large animals across multiple models of liver disease, the hepatocytes engraft, proliferate, vascularize within the lymph node to form life-saving functional ectopic livers. And when you can't kill a program – that's when you raise enough capital to transform this promising regenerative medicine platform into commercially scalable and successful clinical therapies.

www.lygenesis.com

Mitocholine

Mitocholine is the novel generation of bioactive cellular metabolites designed to support and optimise cellular metabolism and energy production to sustain cognitive health and vitality throughout life. Mitocholine is first CNS penetrable formulation applicable for development in therapeutic benefit areas and in general consumer health.

Mitocholine is currently being developed as a novel food fortification ingredient to maintain healthy brain metabolism. Mitocholine is a result of two decades of global scientific research. The concept is based on the multitargeted approach. Mitocholine works in synergistic way to enhance and maintain the energy production by mitochondria in the brain cells and optimises glucose utilisation by supporting insulin response. The product is trademarked Mitocholine and a global proprietary position has been secured, protecting its usage and applications. Mitocholine is currently presales with a significant part of the R&D development and regulatory approvals requirements completed.

Our ambition with Mitocholine is to make it as widely available as possible so that it can have the greatest impact on our health and wellbeing. Round A is required to introduce Mitocholine to the market as Food for Special Medical Purpose by conducting the clinical trials in patients suffering from Mild Cognitive Impairment. Moreover, the novel food regulatory approval gives us the possibility to build the business model based on partnerships with industrial consumer goods producers that have strong branded positions in each of the product categories described above and who are interested in adding Mitocholine as an ingredient to either existing or new affordable brands in their portfolio to offer the widest consumer reach. We will rely on our partner to either establish a new functional beverage brand containing Mitocholine or to fortify an existing brand in their portfolio with Mitocholine.

www.mitocholine.com

Shift Bioscience

Shift bioscience

Shift Bioscience is a Cambridge UK startup applying machine learning to isolate the rejuvenation pathway active during cell reprogramming, providing the means to safely reset cells and tissues to a youthful state with mRNA therapeutics. Shift has raised £900k ($1.2m) from UK and US investors including Jonathan Milner, Karl Pfleger and Healthspan Capital. Shift has a talented scientific team led by Daniel Ives (PhD, U. Cambridge) and machine learning 'clock' innovators Brendan Swain (PhD, U. Cambridge) and Lucas Camillo (BSc Brown University). Wolf Reik serves as scientific advisor (former Director, Babraham Institute).

www.shiftbioscience.com

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"We're looking at 200 companies a year to invest in 10 to 12 possible therapeutics. So our job is actually more about saying no, rather than saying yes."

afar american federation for aging research

GEROFUTURES THINK TANKS Report | 2021

THINK TANK II

Inviting Investment in Gerotherapeutics

WHAT BIOLOGICAL DISCOVERIES ARE MOST LIKELY TO INTEREST INVESTORS IN LONGEVITY? WHY DO YOU THINK THIS?

Investors generally are interested in discoveries that hold promise in the near term; those involving such breakthroughs as biological aging clocks and biomarkers are especially hot now. Understanding the pace of aging will permit standardized measurement of individual aging rates as well as the effectiveness of personalized interventions designed to help us age successfully. This holds true whether the intervention is based on lifestyle (diet or exercise), social (socio-economic circumstances), or pharmaceutical approaches. Access to such data not only increases opportunities for therapeutics but also unlocks future investment opportunities.

Also attractive to investors is research confirmed by multiple labs independently; for example, studies of compounds in mice that could be parabiotic factors or that destroy senescent cells.

Investors also want to see a practical clinical path forward. Meaning: the intervention may target a particular disease with an approved indication for therapeutics, but research also suggests it can affect the aging process and the biology of aging underneath it. That, in turn, offers the promise that it's going to affect other pathways and other disease processes as well in the future.

Other areas include applying artificial intelligence algorithms to large datasets to develop interventions that slow or reverse aging processes, and epigenetic reprogramming, viewed as a promising field, but not as close to translation.

WHAT, IF ANY, REGULATORY CHANGES ARE NEEDED TO ENHANCE THE PROSPECTS OF SUCCESS FOR PRODUCTS OR SERVICES THAT ARE DEVELOPING FROM OUR ENHANCED UNDERSTANDING OF THE BIOLOGY OF AGING? WHY DO YOU THINK THIS?

Convincing the U.S. Food and Drug Administration (F.D.A.) to recognize aging as an indication for therapeutics would create a viable economic model to attract more investment in aging research and development. Moving forward with the TAME (Targeting Aging with Metformin) Trial—a large clinical trial to provide proof-of-concept that aging can be treated, just as we treat diseases—is a critical first step. This would open regulatory doors and provide knowledge about potential biomarkers that will be even more effective at targeting the biological processes of aging underlying most chronic diseases of aging.

Reducing the number of years or decades that it takes to bring a drug to market in the aging field would also spur investment. (Some of the regulatory caution goes back to approvals for early osteoporosis drugs, which improved bone density but later were found to increase the bone fracture rate.) Working with regulators to incorporate surrogate endpoints based on changes to key aging biomarkers would enable clinical trials that establish a human proof-of-concept signal faster and at far less cost.

"We're looking at 200 companies a year to invest in 10 to 12 possible therapeutics. So our job is actually more about saying no, rather than saying yes."

WHAT'S NEEDED NEXT

- Advance the TAME Trial, which would open regulatory doors to drugs that target the multiple diseases of aging
- Continue building relationships with regulatory agencies such as the F.D.A. to allow more efficient, timely clinical trials for drugs that address key biomarkers of aging
- Convene investors interested in longevity, regularly

Insights from global leaders across the biotech, biology, philanthropy, and private sectors on opportunities and gaps in research, therapeutics, and collaboration.

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