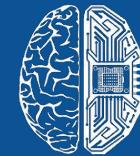
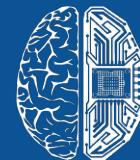




Aging
Analytics
Agency



SpaceTech
Analytics



Deep
Pharma
Intelligence



Deep
Knowledge
Analytics

Mitochondria in Longevity and Space Medicine *Teaser*

Q3 2021

Table of Contents

Introduction	2
Approach of the Report	3
Executive Summary	4
Mitochondrial Clinical Trials Framework	5
Market Overview	10
Key Market Players	13
R&D Centers	14
Market at a Glance	17
Role of Mitochondria in Longevity	33
Mitochondrial Dysfunction Among Other Hallmarks of ageing	34
Place of Mitochondrial Dysfunctions in Space Medicine	35
Prognosis of Treatment Efficacy	36
Diagnostic Accuracy Biomarkers with ageing	37
Mitochondrial Function During Space Flights	38
The Issue of ageing in Space	39
Health Risks for Astronauts	40
AI for Mitochondria and ageing	47
Market and Tech Trends	53
Conclusions	62
Disclaimer	70

Mitochondria in Longevity and Space Medicine Q3 2021 was compiled to give a detailed systematic description of the **innovative approaches for regulating mitochondrial function to control Human Longevity and treat some systemic disorders**, highlighting their practitioner application for astronauts' recovery after space flights. The report focuses on **BioTech, Pharmaceutical and Healthcare companies** and **R&D institutions** and their partnerships, predicting the development of the relevant market, and determining the degree of technology relevance. A unique database was compiled for the systematic review of key stakeholders in the industry.

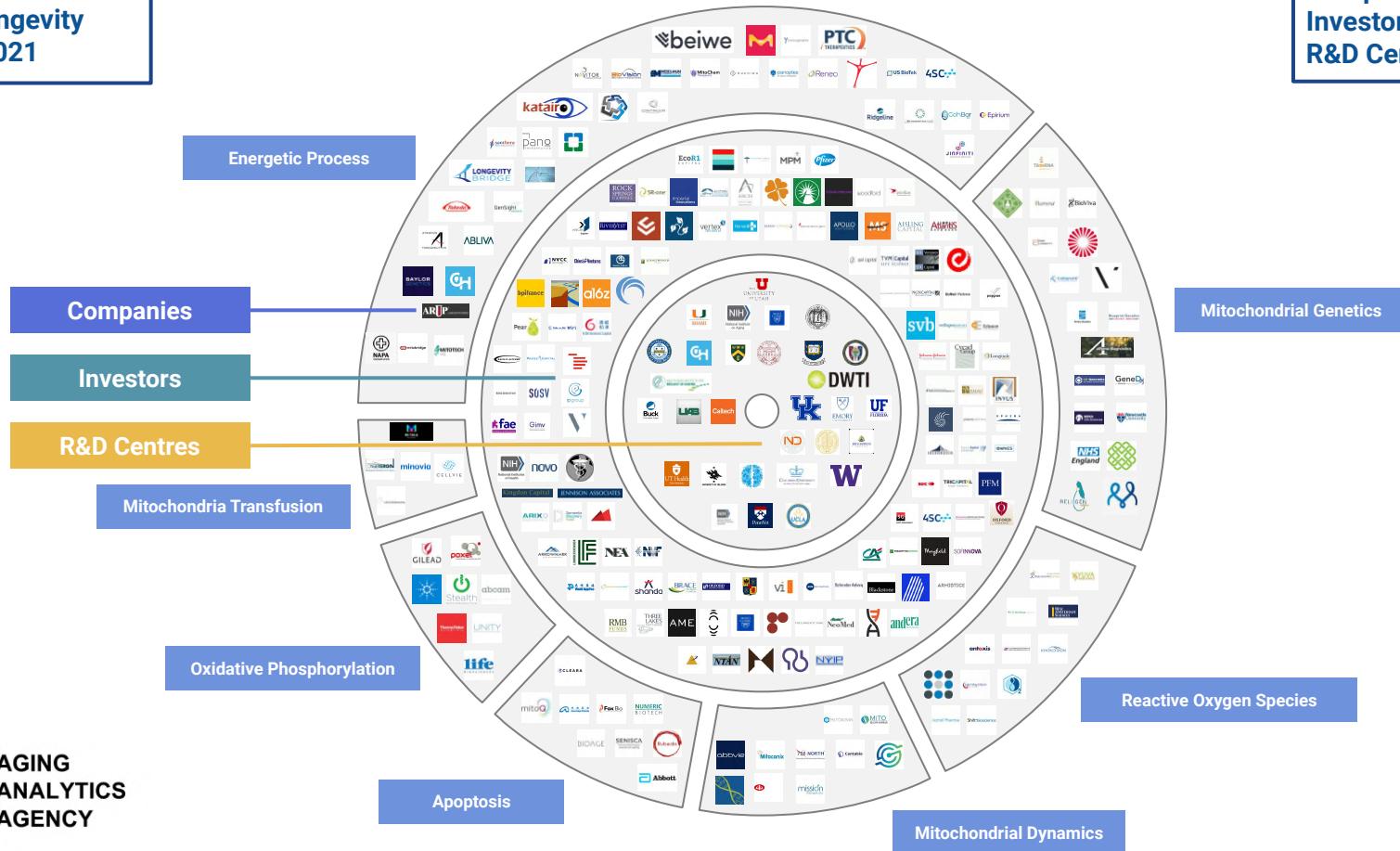
All the technologies described in the analytical case study are already available, in use and ready for further research.

The Mitochondria Targets and Biomarkers are selected by their **clinical efficacy** and create the most relevant modern precedent for safe and effective human experimentation and validation within the realm of SpaceTech and Space Medicine that the Longevity Industry can apply.

Against this background, a separate chapter provides an overview of several interesting scientific and technological **convergences between ageing and the harmful effects of spaceflight**, as well as showing how the **specific therapeutic approaches that are used to protect and preserve the health of astronauts** intersect with Practical Healthy Human Longevity. Overall, this analytical case study offers a one-stop expert evaluation of a novel and dynamic industry with high growth potential.

Mitochondria in Longevity Q3 2021

Companies – 100
Investors – 120
R&D Centers – 30

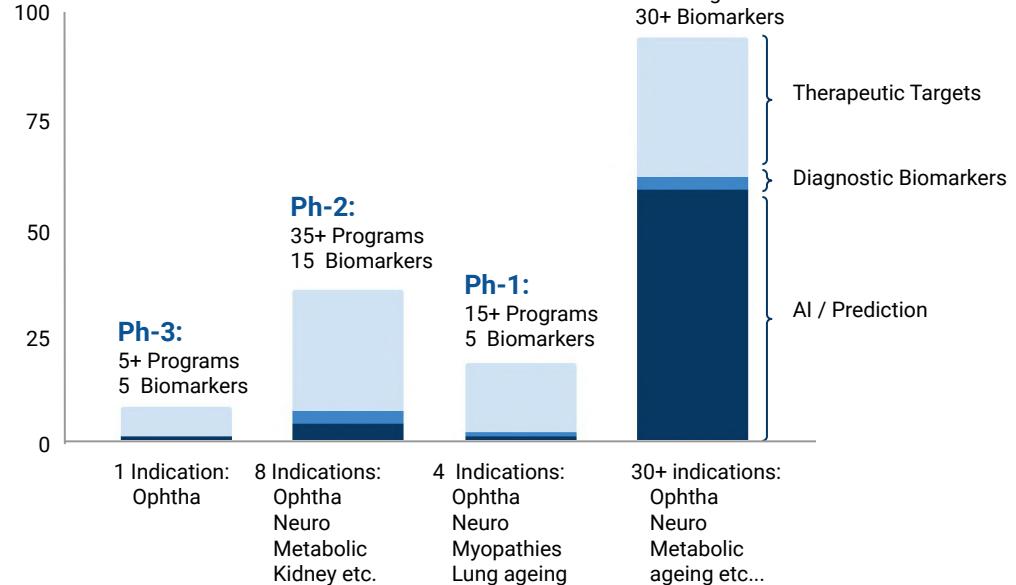


Mitochondria in Ageing: Expansion Avenues / Directions

The BioTech industry is affected less than most by the market and logistical consequences of the COVID-19 pandemic. **BioTech companies and startups in particular just keep working through market downturns** and disruptive events, and are largely only impacted to the degree that they need to raise funding. Progress continues apace. **Mitochondria targeting approach have produced robust results in Ophthalmology.** The first human trials have been completed with promising results, and more are in progress.

The most direct and indirect approaches of mitochondria targeting are under active development, such as mitochondrial antioxidants, mTOR inhibitors, NAD+ enhancers and so on. They are essentially attempting to make the aged metabolism more resilient to underlying damage, or **override some of its reaction to damage, without actually repairing that damage.**

Mitochondria Pipeline: 100+ Programs, 100 Companies



Note: There are low numbers of clinical trial in Phase 1 due to their cancelation during the COVID 19 pandemic.

Mitochondria Treatment Targets

Energetic Processes

AMPK DOHD GIP ATPase ND1
ICT KATP PARP delta Prostaglandin-E
mTOR(1,C1) NAD+ NNMT SIRT1

Apoptosis

BCL-XL BCL-2 ROS
foxo4-p53 FOXO p53
HIF1 ERR

Mitochondrial Dynamics

USP 30 LRRK2 DJ1 MCS
HSP90 HSP27 HSP 70
PINK1 OMA1 SGLT2

Reactive Oxygen Species

NOX1 NOX2 NOX4 ROS
SOD Frataxin STAT3
NOS II NF-E2

Oxidative Phosphorylation

Mitochondrial uncouplers
FRX ACC GLP1R
Mitochondrial pyruvate carrier

Treatment products



Treatment products



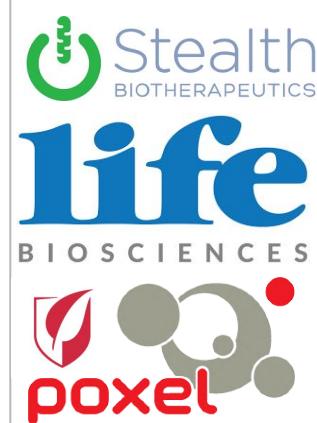
Treatment products



Treatment products



Treatment products



Note: Therapeutic target medicines that are in development or are currently on the market are presented here. It is evident that energetic processes are the primary focus of study and development. Other fields are actively growing, but because of the high complexity, most of them are not yet marketed.

Diagnostic Biomarkers

Mitochondrial Genetics

Single nucleotide polymorphisms
Deletions Gene expression Insertions
Mitochondrial DNA copy number

Biomarkers products, tests, panels



Metabolic Biomarkers

Lactate Pyruvate Orotic Acid
Beta-Hydroxybutyric Acid
Carnitine Acylcarnitine Creatine
Fatty Acids Organic Acids Amino Acids

Biomarkers products, tests, panels



Oxidative Phosphorylation

Pyruvate dehydrogenase complex
Complex I-V H+ (proton) leak
Endpoint relative mitochondrial membrane potential
Dynamic changes in relative mitochondrial membrane potential

Biomarkers products, tests, panels



Mitochondrial Dynamics

Mitochondrial outer membrane integrity
Mitochondrial permeability transition
Muscle biopsy examination Cardiolipins

Biomarkers products, tests, panels



Energetic Process

ATP-linked respiration ADP/ATP ratio
Maximal respiration NAD/NADH ratio
Spare respiratory capacity

Biomarkers products, tests, panels



Note: Biomarkers that currently available on the market both for diagnostics and research are presented here. The most attention is paid to mitochondrial genetics, while mitochondrial dynamics biomarkers are less present in the market due to high complexity of the tests.

R&D Centres by Area of Study*

Fundamental Research / Biology



Caltech



ND



CH



UPF



U



UCLA



SC

- Burke Neurological Institute (USA)
- Caltech (USA)
- Children Hospital of Philadelphia, Wallace Lab (USA)
- Columbia University (USA)
- David Geffen School of Medicine at UCLA (USA)
- Institute for Neurodegenerative Disorders (USA)
- Johns Hopkins Medicine (USA)
- Max Planck Institute for Biology of Ageing (Germany)
- National Institutes of Health (USA)
 - PennVet (USA)
 - University of Cologne (Germany)
 - University of Miami (USA)
 - University of Pittsburgh (USA)
 - University of Southern California (USA)

Diagnostic



CU



NIH



NHS



SDU

- Columbia University (USA)
- Copenhagen University (Denmark)
- Institute for Neurodegenerative Disorders (USA)
- National Institutes of Health (USA)
- NHS Foundation Trust (USA)
- University of Pisa (Italy)
- University of Southern Denmark (Denmark)
- Wuhan University (China)

Therapy



DWTI



MAYO CLINIC



UNIVERSITY OF TEXAS



UAB



UK



USC Leonard Davis
School of Gerontology



UU



- D. Western Therapeutics Institute (Japan)
- Columbia University (USA)
- Mayo Clinic (USA)
- National Institute of Neurological Disorders and Stroke (USA)
- National Institute on ageing (USA)
- The University of Texas (USA)
- University of Alabama at Birmingham (USA)
- University of Florida (USA)
- University of Helsinki (Finland)
- University of Kentucky (USA)
- USC Leonard Davis (USA)
- University of Regina (USA)
- University of Utah (USA)
- Yale University (USA)

AI / Machine Learning



UNIVERSITY OF OXFORD



GEORGIA INSTITUTE OF TECHNOLOGY

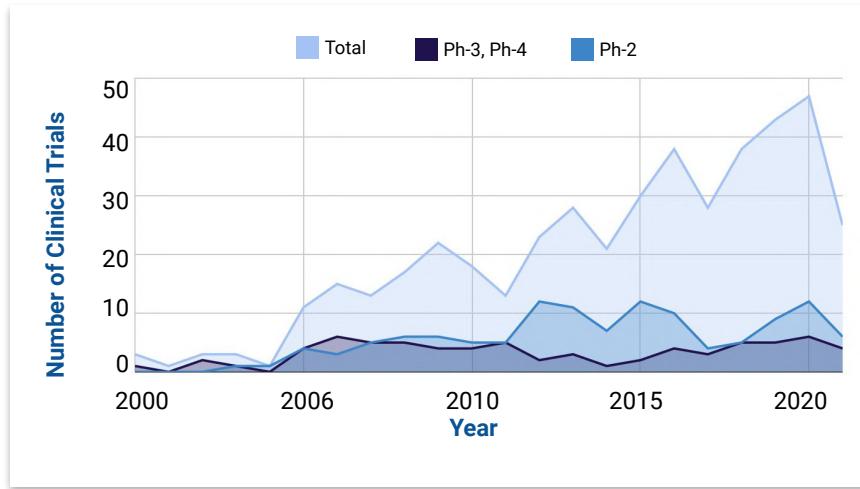


UNIVERSITY OF COPENHAGEN

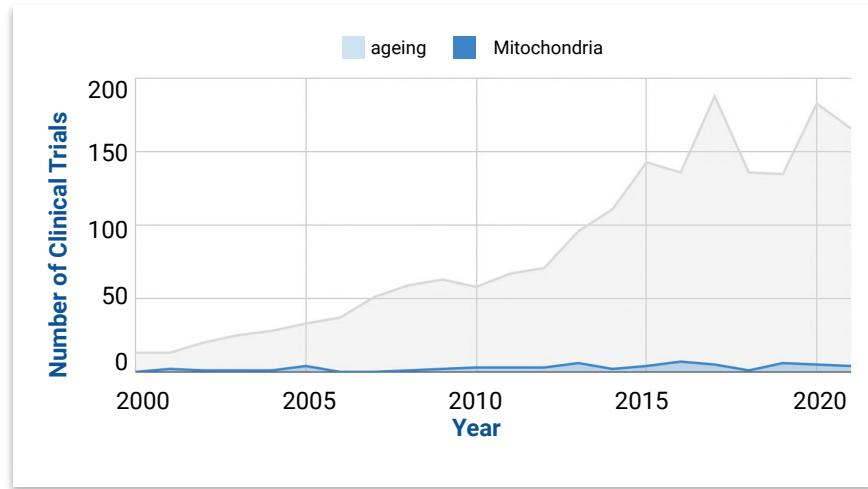
- University of Copenhagen (Denmark)
- George Mason University (USA)
- Buck Institute of ageing (USA)
- Georgia Institute of Technology (USA)
- University of Oxford (UK)

Mitochondrial Clinical Trials vs. Ageing Clinical Trials

Total Number of Mitochondrial Clinical Trials (630 trials)



Share of Mitochondrial Trials in Ageing (2,100 trials)

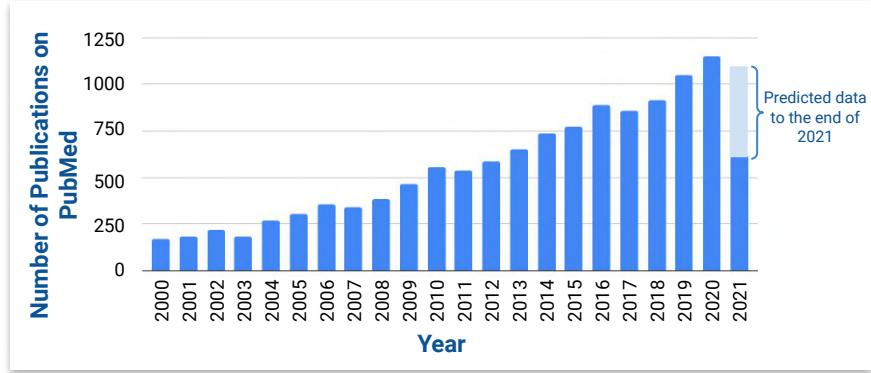


As of 2021, the percentage of clinical trials related to mitochondrial dysfunction is **negligible compared to trials focused on other hallmarks of ageing (~3% of the total amount)**. Of these, only 16% have reached Phases 3 and 4, the stages at which industry-ready products are feasible in the near future.

The majority of other BioTech companies are focussing on reparation energetic processes (37 programs) in mitochondria and reduction of oxidative stress (10 programs).

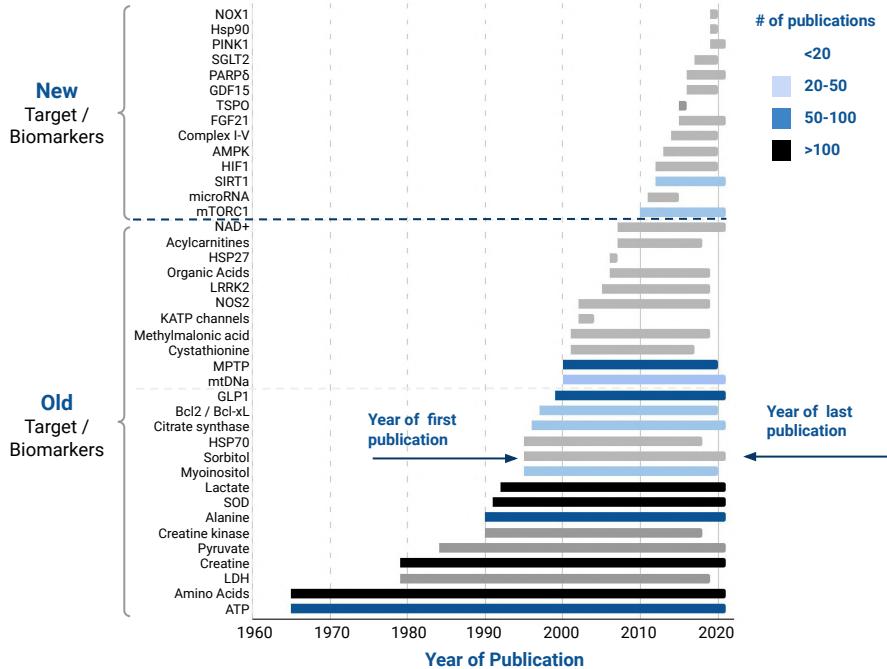
Growth of Scientific Interest in the Role of Mitochondria in Ageing

Total Scientific Interest in the Role of Mitochondria in Ageing



Broadly speaking, scientific interest in the role of mitochondria in ageing is now 10 times greater than it was in the early 2000s. **The most reliable mitochondrial biomarkers**, such as concentration of **amino acids, creatinine level, lactate and SOD** in biological samples, are a “golden standard” for clinical trials. The **new diagnostic biomarkers** are **GDF15 and FGF21**. The other one is **miRNA** which used for diagnostic of mitochondrial disease (TamiRNA). Among the newest mitochondrial therapeutic targets, **the most promising** are **TSPO** for imaging and **SIRT1** and **mTOR** for regulation of energetic processes.

Popularity of Mitochondrial Targets / Biomarkers in Time

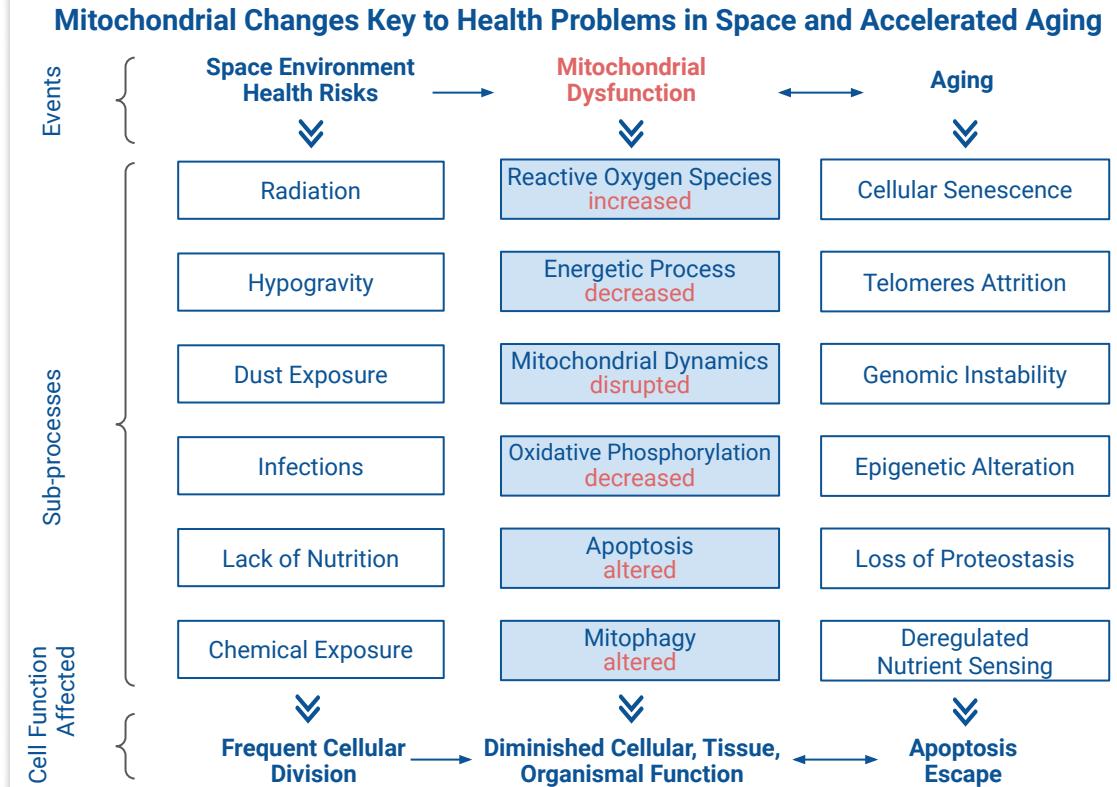


Search Terms

Keywords: “target name” + ageing
Article Type: Clinical Trials

Place of Age-related Mitochondrial Dysfunctions in Space Medicine

The latest studies have shown that with age, the **K_m and V_{max} of complexes I, III, and IV** of the mitochondrial electron transport chain all **decline with time**. As well, the abundance of **ubiquinone and cytochrome c**, two mobile electron carriers within the chain, **both become less**; and **ATP production decreases** at the expense of elevated reactive radical species production. Whether causative or consequential, age-associated **mitochondrial dysfunction is linked with many diseases** that limit life expectancy in humans, including Type II diabetes, metabolic syndrome, Alzheimer's disease, Parkinson's disease, depression, and blindness. The role of mitochondria in the pathogenesis of multiple diseases is a consequence of their role in **generation up to 90% of cellular ATP**. Other important functions of mitochondria include calcium sequestration, Fe-S cluster formation, nucleotide biosynthesis, infection signaling, stem cell maturation, apoptosis signaling, oxidative stress signaling, steroid biosynthesis, and xenobiotic detoxification.



Prognosis of Treatment Efficacy

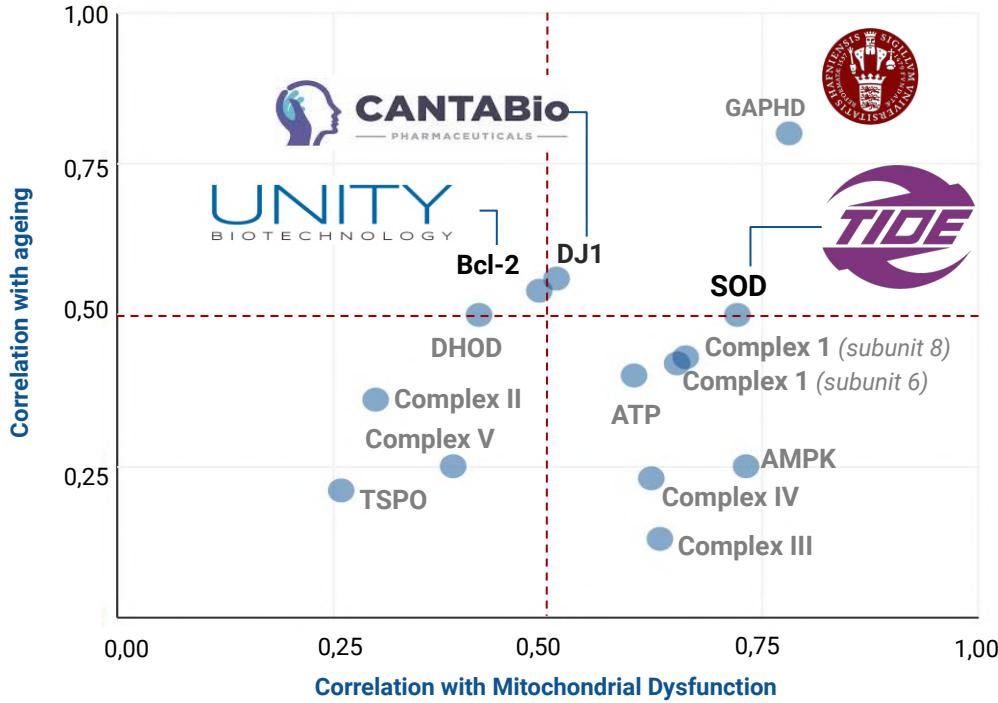
The new direction in ageing treatment is the development of **molecular targeted therapy**, in which mitochondrial processes are regulated by interfering with specific molecules that are necessary for cellular energetic processes and cell death control.

For this purpose, selected mitochondrial targets are validated by their association with ageing and mitochondrial dysfunction.

Data is based on clinical studies of ageing groups (>65 years) vs. young patients (16-50 years).

For analysis of target correlation with mitochondrial dysfunction, we select publications with studies on age-related disease, where patients are compared with a healthy control group of people in the same age range.

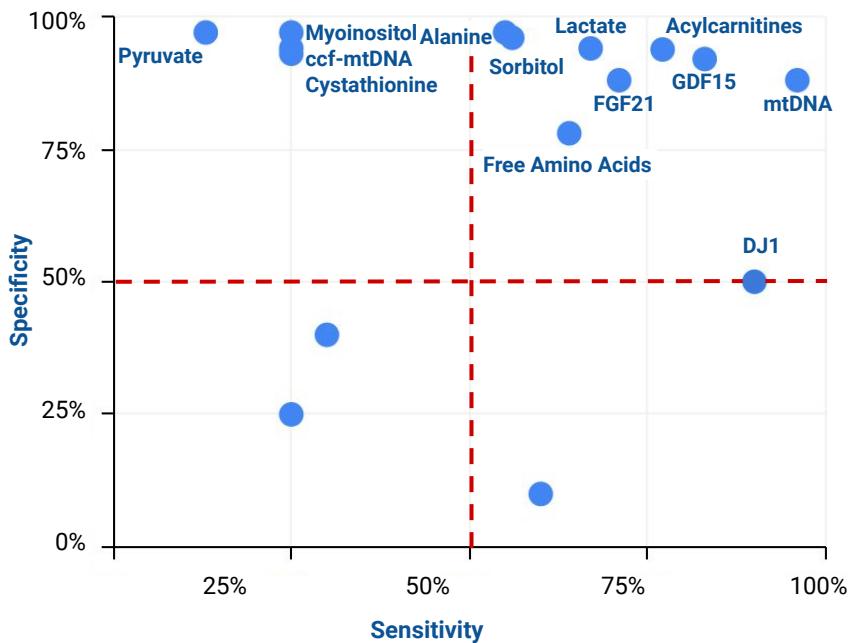
Ranking of Therapeutic Targets



Note: Pearson correlation coefficients with P -value <0.05

Diagnostic Accuracy Biomarkers with Ageing in Patients

Ranking of Diagnostic Biomarkers



Acylcarnitine, GDF-15 and mitochondrial DNA copy number (mtDNA) are the best biomarkers up to date. All three measured biomarkers correlate with chronological age and can be used as Longevity biomarkers, which help in mitochondrial function evaluation.

Acylcarnitine takes part in the transport of free fatty acids into mitochondria. It comes from muscles, the brain, and less from other tissues. This molecule is a good biomarker of **earlier changes in mitochondrial function**.

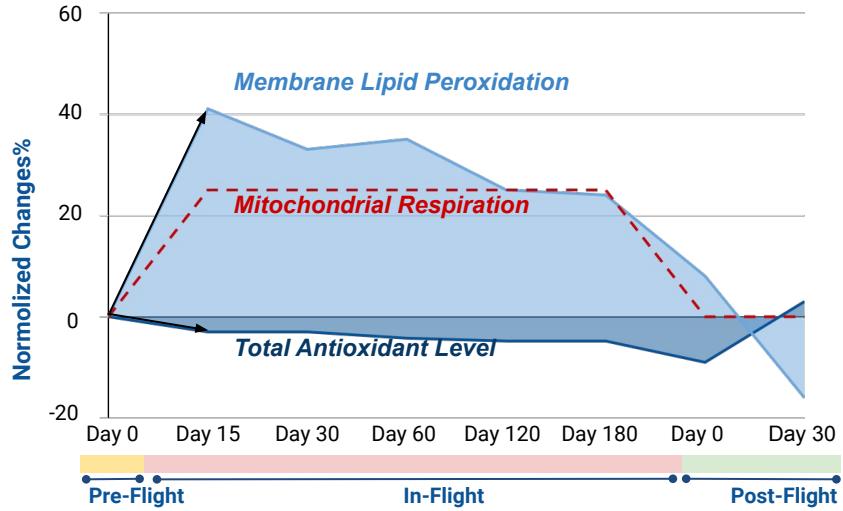
mtDNA copy number reflects the number of mitochondria and their function, and it is good for **predicting both age-related and mitochondrial diseases**. It also has a strong correlation with chronological age and age-related decline.

Another biomarker, known as **Growth Differentiation Factor 15 (GDF-15)**, has a positive correlation with age and negative correlation with telomere length. It is more reliable for the detection of mitochondrial disease.

Note: The sensitivity and specificity of selected biomarkers are measured for to evaluate the accuracy metrics for the detection of specific conditions. These parameters were assessed for the detection of mitochondria or age-related diseases.

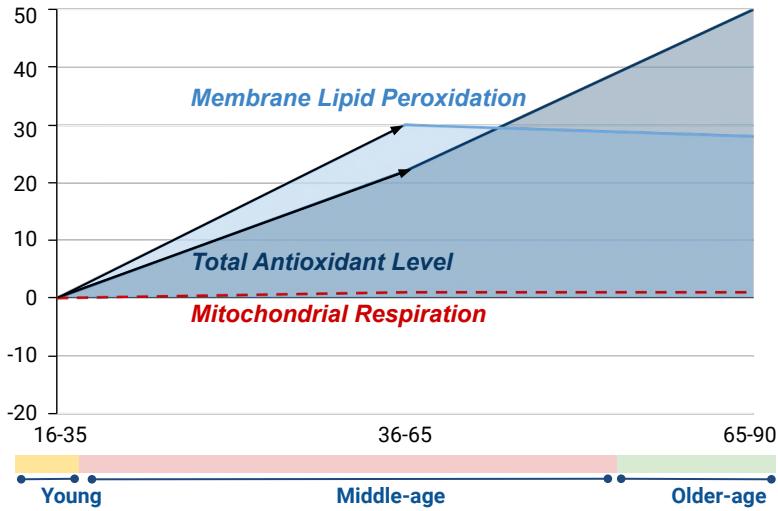
Mitochondrial Respiration and Redox Status in Astronauts vs. Ageing

Astronauts: Alterations of Antioxidant Status



Source: da Silveira et al., 2020, Cell 183, 1185-1201

Healthy ageing: Alterations of Antioxidant Status



Source: M. Kasapoglu, T. Ozben, 2001, Experimental Gerontology 36, 209-220

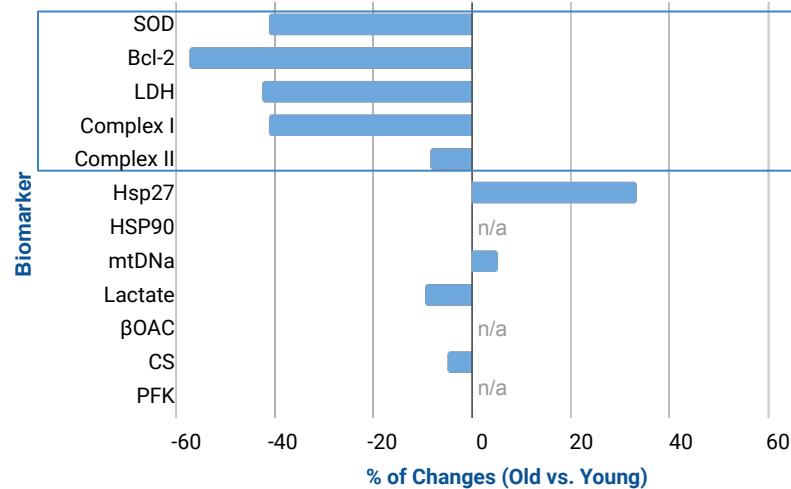
E. Limberaki et al., 2012, Hippokratia, 16(2), 118-123

O. Miro et. al, 2000, Cardiovasc Res.. 18;47(3):624-31

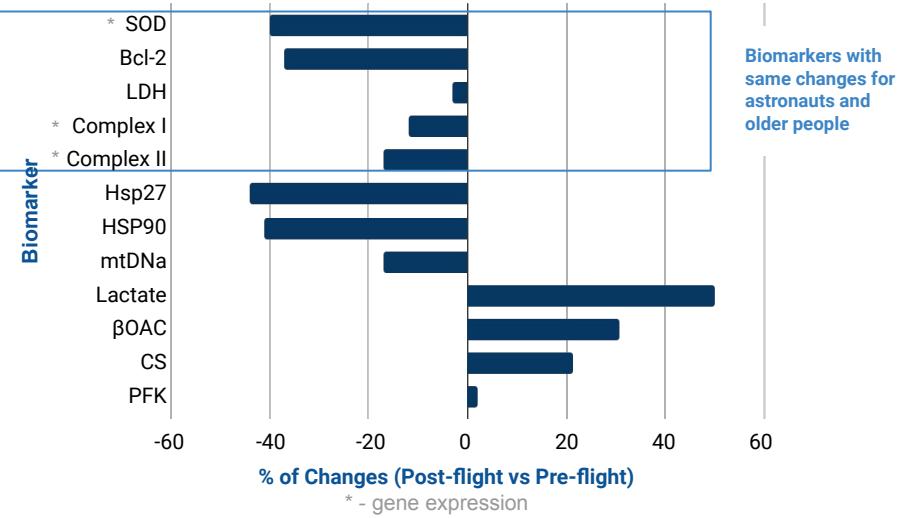
Long space flights lead to **~25% activation of mitochondrial respiration** and **~30% growth of membrane lipid peroxidation** compared to pre-flight levels. In addition, **antioxidant levels in astronauts is 4-10% lower** in space flight compared to pre-flight levels. Oxidative membrane damage was evaluated through the assessment of lipid peroxidation. This damage is also observed in elderly people, but they have increased level of antioxidants and, for that reason, there are no any changes in mitochondrial respiration.

Mitochondrial Biomarkers Changes: Space Flights vs. Ageing

Ageing: Biomarker Level Changes in Older vs. Young People, %



Astronauts: Biomarker Level Changes in Post-flight vs. Pre-flight, %



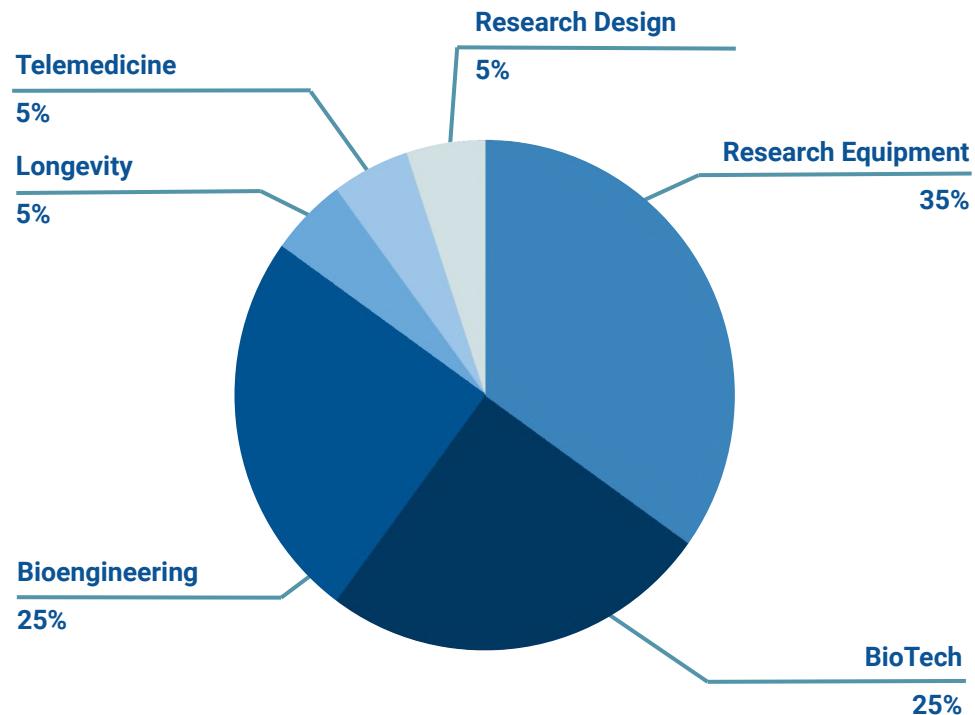
Biomarkers with
same changes for
astronauts and
older people

The NASA Twin Study provided useful results, looking at the same variables in an astronaut on a year-long mission. A number of mitochondria-related changes at the genomic and functional levels related to the one-year mission have been identified.

Unfortunately, studies of space-related stress in whole organism of astronauts are different compared to isolated cells. Only five mitochondrial biomarkers, as SOD, Bcl-2, LDH, Complex I and Complex II have same changes in astronauts after space flights (>6 months) and ageing.

Services to Enhance the Space Medicine Industry

Number of Companies in Each Sector



25% of the Space Medicine Industry is dedicated to **bioengineering** solutions to adverse age-related degenerative conditions in astronauts. These solutions include eye and bone implants and medical hardware to analyse and support astronauts health. An additional 25% of the industry is focused on **biotechnology** dealing with space related disorders and *in situ* amino acid production.

More than 35% of space related companies **provide research equipment for the ISS**.

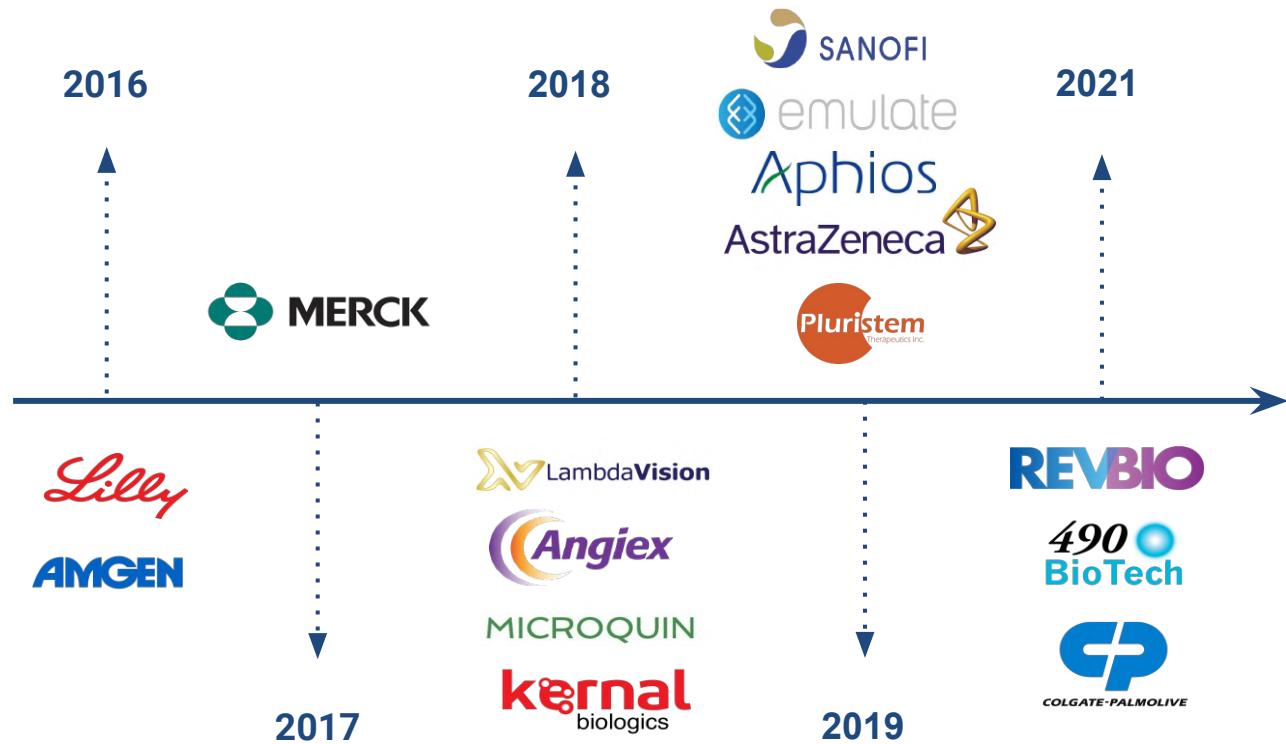
Five percent is dedicated directly to Human Longevity in space. In particular, a new venture capital fund called **SP8CEVC** is placing a laser-tight focus on the intersection between SpaceTech and Human Longevity.

Timeline of Private Biological Research at the International Space Station

The International Space Station (ISS) became available for private research from the beginning of 2016.

Most investigations were carried out by pharmaceutical companies and studies were related to pharmacokinetics and drug delivery systems.

Due to the COVID-19 pandemic, no private research was carried out in 2020.



Private Age-Related Research In Space

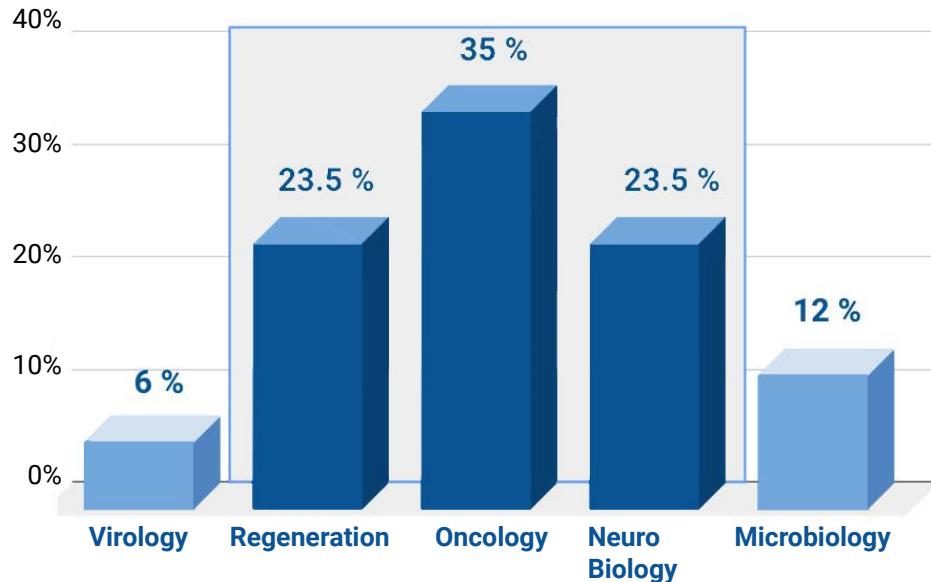
Low Earth orbit is a unique environment for the investigation of novel approaches for mitigating age-related disorders.

Thirty-five percent of all private research on the ISS is dedicated to drug delivery systems to overcome **cancer**.

A combined **47%** of applied sciences are focused on **neurodegenerative disorders therapy**, mainly for Alzheimer's disease, and **regenerative medicine**: muscle and bone restoration using human cell cultures. The gray background in the graph opposite highlights the age-related fields.

As microbes in space change their metabolism and cause serious harm to astronauts, almost 12% of private research is dedicated to microbiology and 6% to the study of viral replication and production study, including vaccine development for space.

Main Research Fields



Top Companies Advancing in Space Medicine



United States



Biogen Inc

Cambridge, Massachusetts, United States



Amgen

Thousand Oaks, California, United States



RevBio

Lowell, Massachusetts, United States



Angiex

Cambridge, Massachusetts, United States



Kernal Biologics

Cambridge, Massachusetts, United States



Merck

Kenilworth, New Jersey, United States



MicroQuin

Cambridge, Massachusetts, United States



490 BioTech

Knoxville, Tennessee, United States



Tympanogen, Inc.

Richmond, Virginia, United States



Eli Lilly

Indianapolis, Indiana, United States



SP8CEVC, Venture Capital

New York, New York, United States



Israel



SpacePharma

Herzliya Israel, Courgenay Switzerland



Pluristem Therapeutics Inc.

Haifa, Israel



France



Sanofi

Paris, Ile-de-France, France



Medes

Toulouse, Midi-Pyrenees, France



United Kingdom



AstraZeneca

Cambridge, Cambridgeshire, United Kingdom



Netherlands



OrgaNext Research

Arnhem, Gelderland, The Netherlands



Italy



Kayser Italia

Livorno, Toscana, Italy



Switzerland



Nova Space Biotechnology

Zürich, Zurich, Switzerland



Novartis

Basel, Basel-Stadt, Switzerland

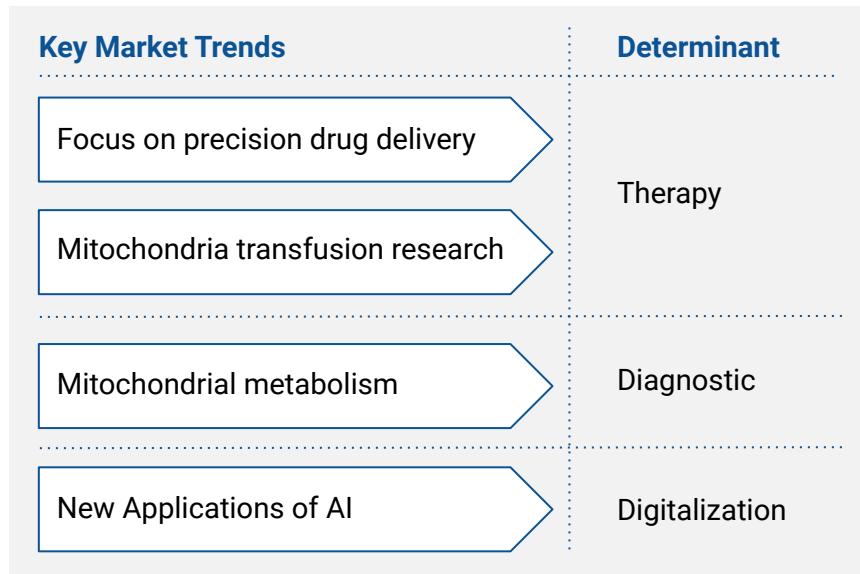
Sixty percent of all private companies with space medical research presented here have their headquarters in the US. An additional 30% are located in Israel, France or Switzerland. Other companies are distributed equally between UK, Netherlands and Italy.

Overview of Five Companies that Implement AI in their Work

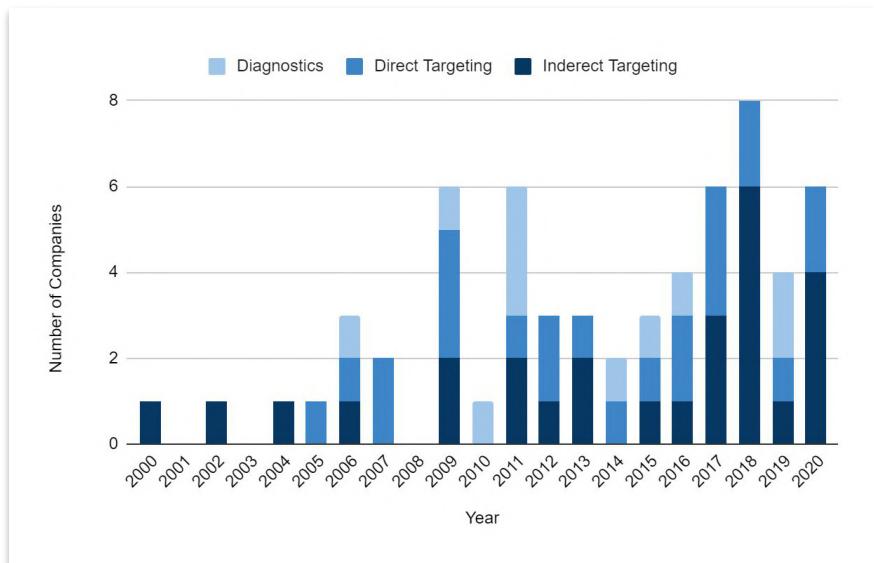
Company	 Insilico Medicine	 DEEP LONGEVITY	 deep genomics	 NANNA THERAPEUTICS An Astellas Company	 BIO AGE
Approach	Biological age calculator	Biological age calculator	Identifying novel targets and searching for the best Steric Blocking Oligonucleotide (SBO) for their treatment	Early drug development for mitochondrial dysfunction-related diseases	Identification of key drug targets that impact ageing
Input Data	Blood test parameter	Lifestyle data, photo, blood test, epigenomics and transcriptomics data, microbiome data, HRV, psychological test	Whole-genome sequence	Chemical design of compound	Blood test parameters, omic data, and medical records
Output Data	Biological age and lifestyle recommendations	Ageing clocks, biological age and personalized longevity plan	Mutations that might be targets and SBOs for them	Drug efficacy, Structure Activity Relationships (SAR), selectivity, toxicity, other drug properties	Novel ageing targets

Market Trends

The graph opposite illustrates the growth in the number of companies on the market since 2000. Recently, the increase in the number of projects working on mitochondria for longevity has been **caused by the synergy of four key factors:**



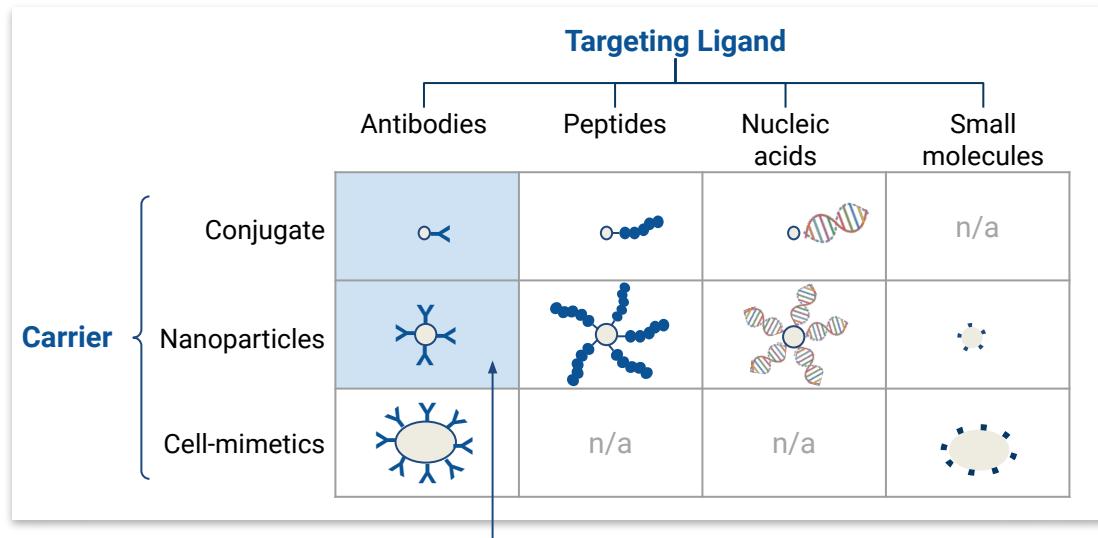
New Companies: Mitochondria Targeting for ageing Treatment



Note: Perhaps ~100 BioTech companies and startups are carrying out work that may lead to a form of rejuvenation or are focused on interventions that target the mechanisms of ageing. Nearly all of these companies are at most a few years old, in preclinical development or in early trials, and Big Pharma has yet to become earnestly involved in the Longevity Industry.

Approach Review: Mitochondrial Drug Delivery

The Mitochondrial Targeted Drug Delivery System



Note: The Guilarte laboratory has pioneered the validation and application of Translocator Protein 18 kDa (TSPO) as an early, sensitive and predictive biomarker of brain disorders and has been a leader in determining the function of TSPO in glial cells. NASA seeks “[a]n approach... to extrapolate existing observations to possible cognitive changes, performance degradation, or late CNS effects in astronauts. We believe non-invasive TSPO imaging may help provide a method and approach that could be utilized today, in pre-flight and post-flight testing of astronauts...”.



Precise targeting of mitochondria and direct drug delivery to this organelle is the most promising widely-used approach for the treatment and diagnosis of various diseases. There are several variations for the ideal design and development for mitochondrial-targeted drugs, such as the selection of suitable ligand and linker targets or delivery in nanocarriers. In an ideal world, nanoparticles with targeting ligands can solve some challenges related to drug solubility and the selectivity of therapeutic drugs, and they offer elegant platforms for mitochondria-specific drug delivery. Unfortunately, the direct delivery of therapeutic molecules is not sufficiently reflected in the treatment and diagnosis of ageing. Only a few R&D Centres are trying to develop this approach.

Approach Review: Mitochondria Transfusion Research

Transplantation of functional mitochondria directly into defective cells is a novel approach that has recently caught the attention of scientists and the general public alike. The company **Mitrix** is actively developing a **whole-body mitochondria transfusion** to cure a variety of mitochondrial dysfunction that are generally correlated with ageing.

Mitrix is still a company in its earliest stages, and what it is proposing is the only theory at this point, but the progress made in the understanding of mitochondria over the past 10 years makes it a theory worth pursuing.

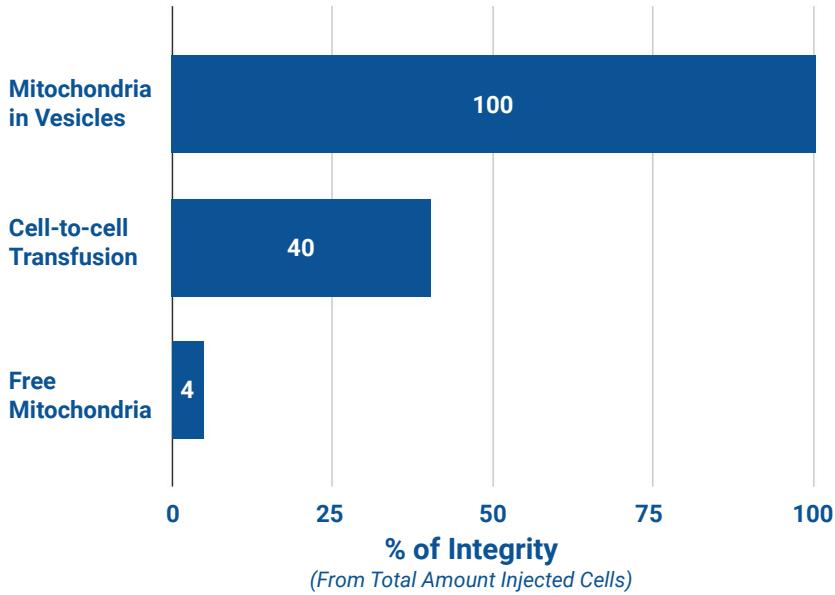


News

Mitrix wants to create biobanks of our “young mitochondria” that we can use to help our cells regenerate as we age.

Californian start-up **Mitrix** this week secured \$250,000 in pre-seed funding to embark on its mission to develop a “whole body mitochondrial transfusion” technology. The company is the first investment of Ronjon Nag’s [R42 AI and Longevity Fund](#), which split the round 50/50 with Petr Sramek’s [Longevity Tech Fund](#).

**Effectiveness of Donor Mitochondria Transfer into Host Cells
(Animal Studies)**



Cell-to-cell Transfusion – mitochondria transferred from Mesenchymal Stem Cells to T cells; **Mitochondria in Vesicles** – mitochondria transferred in Asialo Orosomucoid-Polylysine with Listeriolysin O capsules into hepatocytes.

Approach Review: Gene Therapy

NASA is currently pursuing a **three-year mission to Mars**, which is much further away than the ISS, which orbits at a height of about 200 miles.

NASA named **radiation as one of its top research priorities** last year, stating: "Though far off, a medication that would counteract some or all of the health effects of radiation exposure would make it much easier to plan for a safe journey to Mars and back."

Scientists in this field of study are proposing to build upon knowledge already gained in the study of human ageing. Part of the plan is to **make some human cells radio-resistant**.

Scientists want astronauts to have **personalised drugs** tailor-made for their own bodies. To do this, they will have to use AI to pinpoint which cells are more resistant than others and fortify them using gene therapy.

Space

This article is more than 3 years old

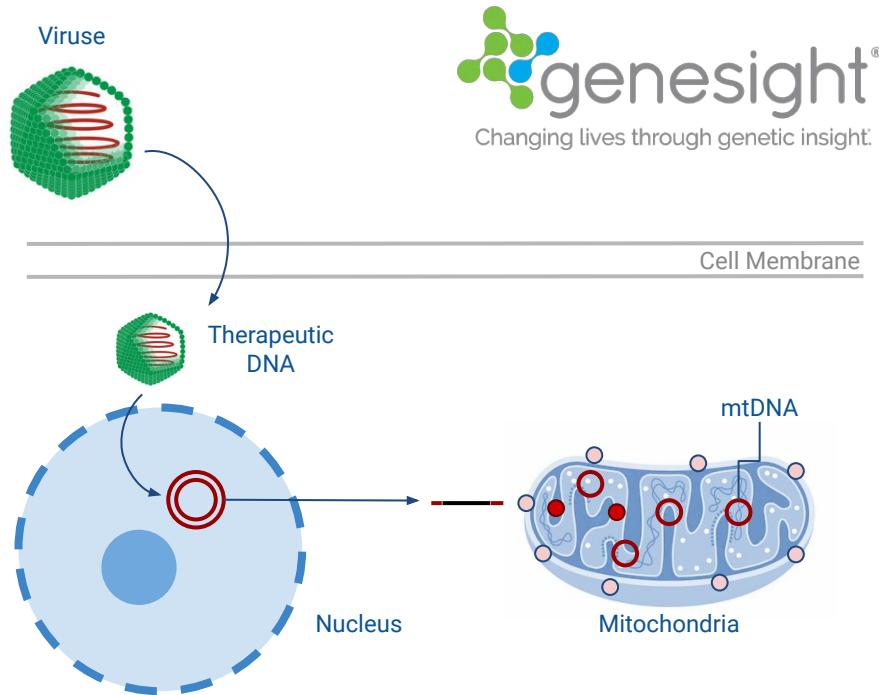
Gene therapy may help astronauts going to Mars resist deadly radiation

Researchers and scientists say new discoveries and drug creation could be beneficial to future astronauts on deep space missions



Source: The Guardian

How Can Gene Therapy Improve Mitochondria in Astronauts?



Note: The GS010 product candidate for ND1 gene in mtDNA (NADH dehydrogenase subunit 4 replacements) is now in late Phase III trials.

New Technologies in Mitochondrial-based Therapeutics

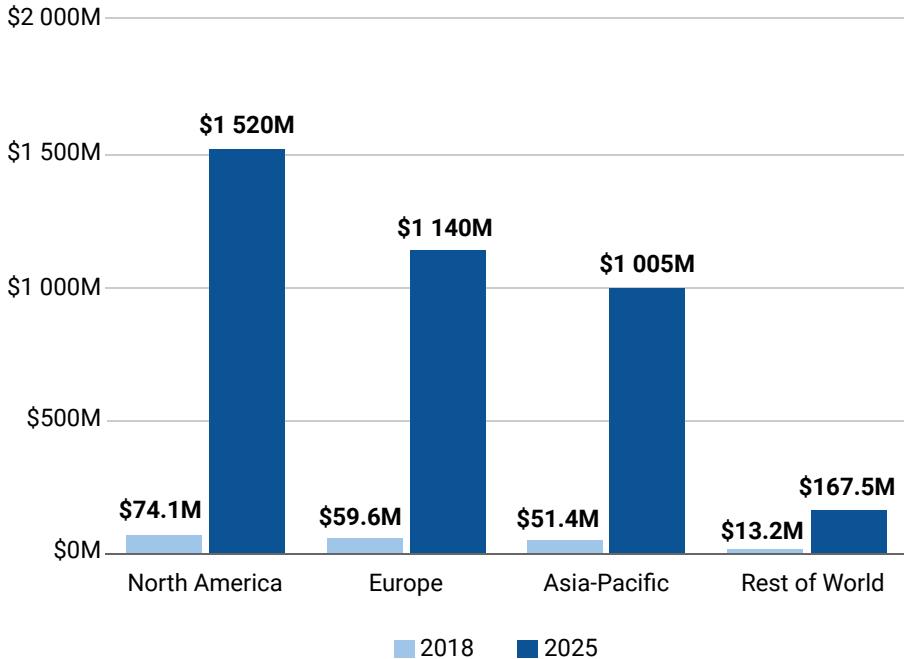
Some of the novel drugs that are currently being assessed include **mitochondrial biogenesis enhancers** (bezafibrate, epicatechin, and RTA 408), **antioxidants** (RP 103 and EPI-743), and **cardiolipin protector** (elamipretide).

At the same time, with traditional therapy, some outstanding approaches have been developed, including **mitochondria transfusion** and **mitochondria-targeting drug delivery**.

Gene therapy has shown positive results in the treatment of LHON, and the first successful gene therapy based on editing of the mtDNA *in vivo* has brought hope of curing mitochondrial diseases. Moreover, other potential therapeutic methods are expected to provide more treatment options for mitochondrial diseases.

One of the most-used **AI-driven software solutions** for developing mitochondrial therapeutics is machine learning. Supervised machine learning algorithms underlie novel tools that enable automated, high throughput and unbiased screening of changes in mitochondrial morphology and biochemistry.

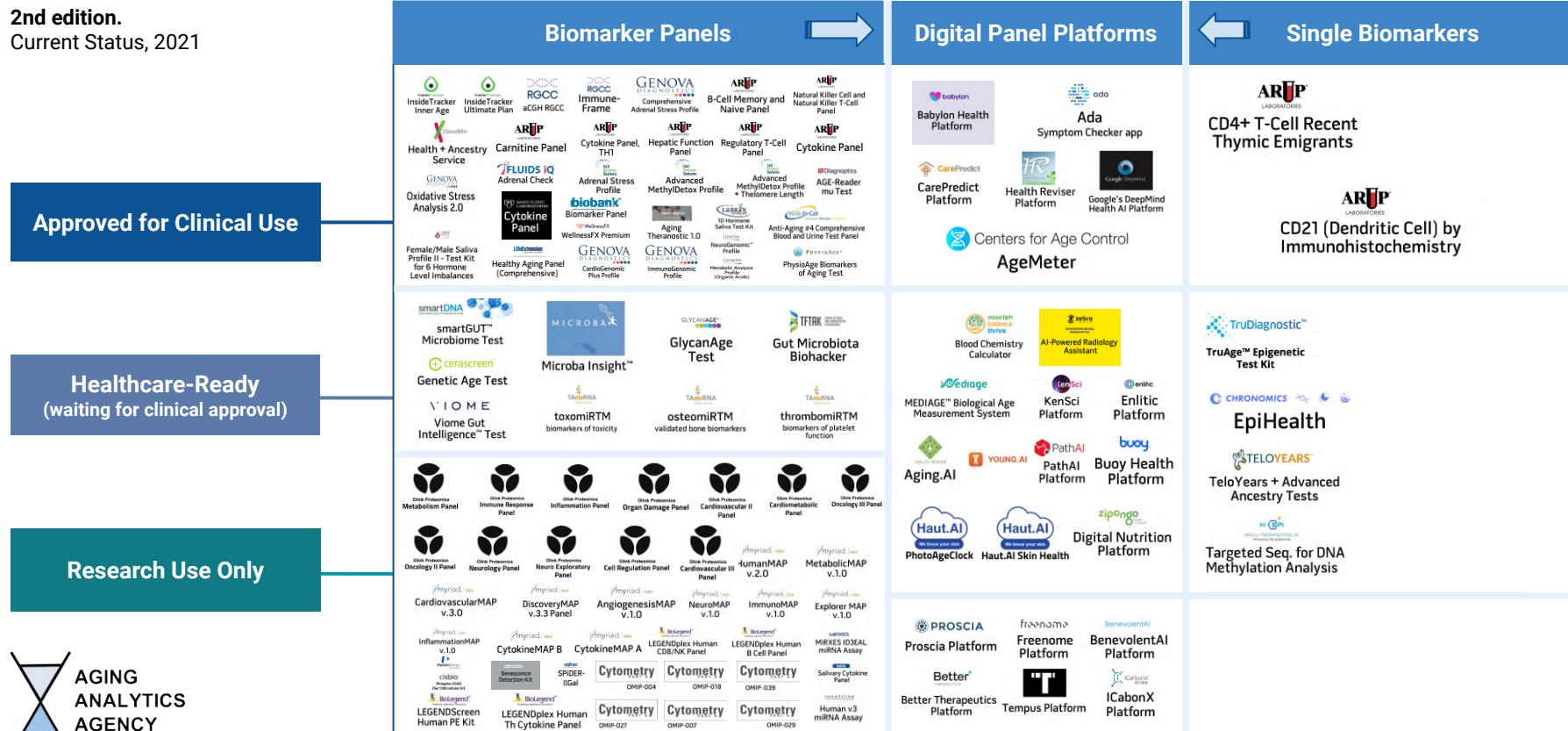
AI Market in the Global Biopharma Industry in 2018 and a Projection for 2025, by Region



Biomarkers of Longevity

Approved for Clinical Use - 41
Research Use Only - 45
Healthcare-Ready - 33

2nd edition.



Longevity Investment: Big Data Analytics Dashboard

 AGING
ANALYTICS
AGENCY

Longevity Investment Big Data Analytics Dashboard

Market Intelligence

Longevity Investment Market Intelligence

- Major Trends
- Network Diagrams
- Interactive MindMaps

Interactive Mindmaps



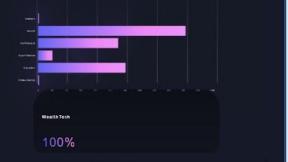
[View More](#)

Dashboard Parameters

DATA POINTS	PERSONALITIES	COMPANIES
814090	16107	19603

INVESTORS	SECTORS	SUBSECTORS
9007	14	140

Dynamic Industry Charts



100%

[View More](#)

Longevity Investment Market Intelligence

- SWOT Analysis
- FAQ & Tutorials
- Register Free Account
- Send Us Feedback

Search Engine

Longevity Investment Ecosystem Investors

- Investor Portfolio Search
- Investor Competitors Search
- Investor Search

Investor & Company Advanced Search



[Find Investors](#) [Find Companies](#)

Competitor Search

Investors	Competitors	Competitors' Investors
Fidelity Management and Research	Serény Therapeutics	A. W. Peary & Associates
PineBoro Ventures	Atellica	ATDE
Park Bio Health	Biogen	Assure Health Sciences Accelerator
Quince Capital	Bluebird Bio	Advanced Technology Ventures
Hedge Fund	Immunomedics	Alpha Prime Partners
Rock Springs Capital	Immunovaccine AS	Alpha Prime Partners

[Company Competitors](#) [Investor Competitors](#)

Interactive Network Diagrams



[View More](#)

Longevity Investment Ecosystem Companies

- Company Investor Search
- Company Competitors Search
- Entrepreneur Search

Welcome There!

About Aging Analytics Agency



Aging Analytics Agency is primarily interested in strategic collaboration with international corporations, organizations, and governments in longevity-related projects and initiatives.

Aging Analytics Agency is open for cooperation with strategic clients via a variety of approaches, including:

- Conducting customised case studies, research and analytics for internal (organizational) use, tailored to the precise needs of specific clients;
- Producing open-access analytical reports;
- Offering customised analysis using specialised interactive industry and technology databases and IT-platforms.

In certain specific cases, and if it meets our interests, Aging Analytics Agency is open to co-sponsoring research and analytics for the production of internal and open-access industry reports, as well as special case studies for a variety of governmental, international and corporate clients. Their topics may include Longevity, the Longevity Financial Industry, Longevity Policy and Governance, as well as the development and execution of full-integrated National Healthy Longevity Development Plans tailored to the specifics of national governments and economies.

About Deep Pharma Intelligence



Deep Pharma Intelligence produces regular analytical reports on major areas of high potential in the pharmaceutical and healthcare industries, maintaining ratings of companies and governments based on their innovation potential and business activity in the BioTech space, and providing strategic consulting and investment intelligence services to top-tier clients. Our clients include major investment funds and banks, family offices, insurance companies, government organizations, and big pharma companies, among others. The company is a joint venture between the two highly specialized UK-based market intelligence hubs in Pharma / BioTech space:



Pharma Division of Deep Knowledge Analytics (PD-DKA), a specialized subsidiary of Deep Knowledge Analytics (DKA), the leading analytical entity specifically focused on deep intelligence of the high-potential areas in the pharma industry, including artificial intelligence (AI) for drug discovery sector.

Deep Knowledge Analytics Pharma Division serves as the main source of investment intelligence and analytics for AI-Pharma, a specialized index hedge fund for the AI in the drug discovery sector. PD-DKA's insights are frequently covered by top media such as Forbes and the Financial Times, and are acknowledged by top pharma executives.

Recently, MIT named this division a top technology think-tank, acknowledging the AI ranking framework it developed.

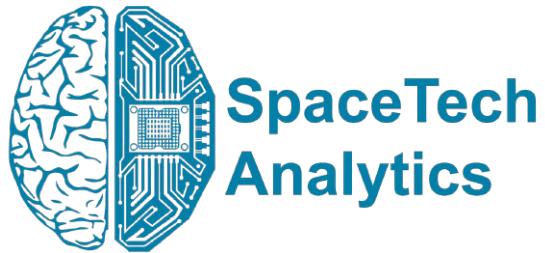
Bio
Pharma
Trend

BPT Analytics (BiopharmaTrend) - a rapidly growing analytical portal and media resource dedicated to tracking emerging companies (startups/scaleups), innovations, investments, and trends in the pharma and biotech space.

BiopharmaTrend's reports and articles were referenced by Deloitte, Forbes, and other high-profile media and consulting companies.

BiopharmaTrend is a media partner to several top-tier conferences and symposia in preclinical, clinical, and healthcare research.

About SpaceTech Analytics



SpaceTech Analytics is a strategic analytics agency focused on markets in the:

- Space Exploration,
- Spaceflight,
- Space Medicine, and
- Satellite Tech industries.

The range of activities includes research and analysis on major areas of high potential in the SpaceTech industry, maintaining profiling of companies and government agencies based on their innovation potential and business activity, and providing consulting and analytical services to advance the SpaceTech sector.

Our IT-Platform is designed to make key strategic recommendations and guidance regarding space-related technologies and techniques within reach of companies, other entities, and nations to assist them in optimizing their action plans and strategies, providing specialized guidelines for business and investment core decisions.



**AGING
ANALYTICS
AGENCY**

E-mail: info@aginganalytics.com

Website: www.aginganalytics.com

Aging Analytics Agency (AAA) Disclaimer.

The information and opinions in this report were prepared by Aging Analytics Agency. The information herein is believed by AAA to be reliable but AAA makes no representation as to the accuracy or completeness of such information. There is no guarantee that the views and opinions expressed in this communication will come to pass. AAA may provide, may have provided or may seek to provide advisory services to one or more companies mentioned herein. In addition, employees of AAA may have purchased or may purchase securities in one or more companies mentioned in this report. Opinions, estimates and analyses in this report constitute the current judgment of the author as of the date of this report. They do not necessarily reflect the opinions of AAA and are subject to change without notice. AAA has no obligation to update, modify or amend this report or to otherwise notify a reader thereof in the event that any matter stated herein, or any opinion, estimate, forecast or analysis set forth herein, changes or subsequently becomes inaccurate. This report is provided for informational purposes only. It is not to be construed as an offer to buy or sell or a solicitation of an offer to buy or sell any financial instruments or to participate in any particular trading strategy in any jurisdiction.