

“The Rising Wave Of Human Biomarkers of Longevity: Landscape Overview 2020” is an open-access special analytical case study by Aging Analytics Agency that uses comprehensive analytical frameworks to rank and benchmark existing panels of biomarkers of aging, health and Longevity according to their ratios of accuracy vs. actionability, identifying the panels of biomarkers that can have the greatest impact on increasing both individual and national Healthy Longevity in the next few years, for use by a wide variety of strategic decision makers including companies, investors, governments and insurance companies.

Using this data, the report and IT-Platform provides practical recommendations to key industry leaders in order to more intelligently and relevantly optimize the conception, development and maturation of their action plans and strategic vision, providing insurance organizations with a tool to improve their customer services and risk pricing principles, and to policy makers, in order to combat the problem of Ageing Population and to transform it into the opportunity of National Healthy Longevity for the mutual benefit of their citizens and national economy.

The report is designed to make key strategic recommendations regarding technologies and biomarkers implementations within the reach of companies, entities and nations in order to assist them in optimizing their developmental plans and strategies, providing specialized guidance for business and investment core decisions, including a comprehensive list of single biomarkers of aging and panels (their advantages and disadvantages), a concrete analysis of recent novel biomarkers of aging just entering R&D processes today, an overview of why AI platforms will come to be a necessary and indispensable component of Longevity biomarker discovery, research and development, and a classification and analysis of the most advanced ageing biomarkers (ageing clocks).

**165**  
Biomarkers

**70**  
Companies

**9**  
Sectors

**3**  
Amplitude  
Levels

**3**  
Conditioning  
Stages

**6**  
Operational  
Categories

### Tangible Benchmarking of Human Biomarkers of Longevity by Market Readiness Level, Type, Precision and Use-Case

The report and IT-Platform seek to provide tangible and actionable answers to several important questions:

*What are the current most comprehensive biomarkers and panels to follow the aging trajectory and its related conditions, the most actionable and technologically mature biomarkers and tools?*

*What leading personalised and preventive market-ready health assessments can aging biomarkers and panels dispense to the existing pipeline of healthcare and insurance entities to maximize their competitive advantage?*

*What novel updates and advances in biomarker-related research and development will impact the health industry in the next years? Which of those should be watched closely for integration into clinics and biomedical, healthcare and insurance companies' existing pipelines as soon as their conditioning is achieved?*

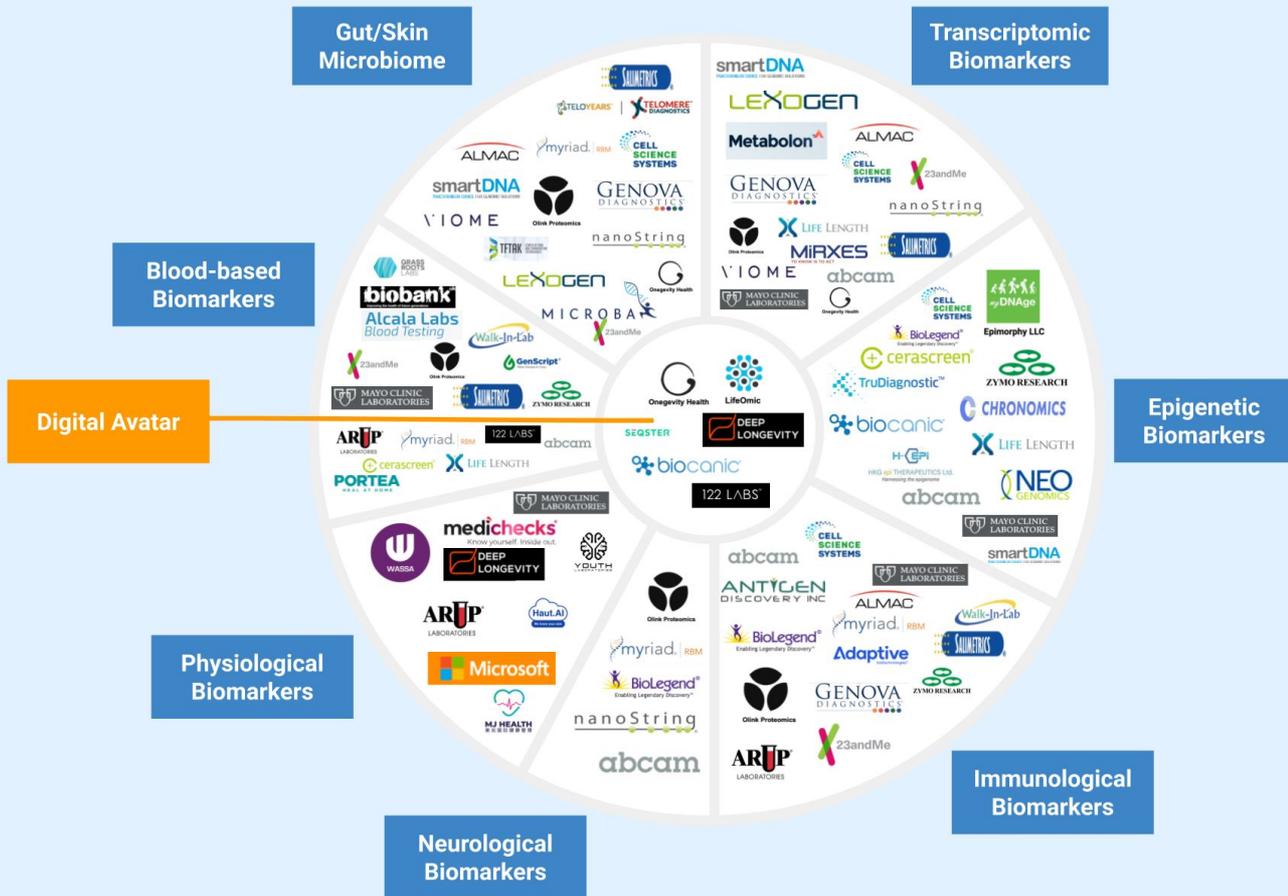
The report features benchmarking, classification and deep analysis of more than **150 Single Biomarkers** and **100+ Diverse Biomarker Panels**, directed toward including **healthcare organizations, insurance companies, regulatory and government healthcare authorities**, for integration of multiple biomarkers for practical use, such as drug discovery and development for Longevity, Longevity therapies development, building precision health practises and research workflows, diagnostics in longevity clinics, building insurance plan strategies and risk assessment principles, outlining the present state of Human Longevity Biomarkers.

### Key Deliverables on Biomarkers of Human Longevity for Companies, Investors, Governments & Insurance Companies

The project is designed to elucidate the precise state-of-the-art in both R&D-phase, clinical translation phase and market-ready phase Human Biomarkers of Longevity, roadmapping most prospective, stable and relevant use cases and delivering precise expertise on how companies, investors, governments and insurance companies can optimize their strategic, technological, business and scientific prospects in order to deliver the most sophisticated and comprehensive precision health products and services for their clients:

- ❑ Concrete deep analysis of which biomarkers and biomarker panels are available today; its strengths and weaknesses, their accuracy, availability and current actionability, their strength, and weaknesses, technology readiness levels (TRLs), and peculiarities of each type of longevity biomarkers related to its uses for real-time and precision monitoring of health status, and biological age;
- ❑ Tangible estimations of which biological age biomarkers and implementations are consolidated, or their current conditioning stage for precision assessment of health status and endpoints of clinical trials and therapies, the use in insurance risk assessments;
- ❑ Highlights regarding the role of digital biomarkers, and AI platforms and how they will become necessary and indispensable components of ageing and Longevity biomarker discovery, research, development and users daily use; overview of mobile apps containing actionable biomarkers or ageing clocks.

# Landscape of Companies Developing Human Biomarkers of Longevity



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

2nd edition. Selection and Current Status, 2020

Approved for Clinical Use

Healthcare-Ready (waiting for clinical approval)

Research Use Only

Biomarker Panels	Digital Panel Platforms	Single Biomarkers
<ul style="list-style-type: none"> <li>smartDNA: smartGUT™ Microbiome Test</li> <li>GENOVA DIAGNOSTICS: Comprehensive Adrenal Stress Profile, B-Cell Memory and Naive Panel, Natural Killer Cell and Natural Killer T-Cell Panel</li> <li>ARUP: CD4+ T-Cell Recent Thymic Emigrants, CD57+ NK Cells, Peripheral Blood by Flow Cytometry</li> <li>GENOVA: FLUIDS IQ Adrenal Check, Adrenal Stress Profile, Advanced MethylDetox Profile + Thelment Length, AGE-Reader, Mito Test, Anti-Aging #4 Comprehensive Blood and Urine Test Panel, PhysAge Biomarkers of Aging Test</li> <li>ARUP: CD21 (Dendritic Cell) by Immunohistochemistry</li> </ul>	<ul style="list-style-type: none"> <li>Babylon Health Platform</li> <li>Ada Symptom Checker app</li> <li>CarePredict Platform</li> <li>Health Reviser Platform</li> <li>Google's DeepMind Health AI Platform</li> <li>Centers for Age Control</li> <li>AgeMeter</li> <li>Blood Chemistry Calculator</li> <li>AI-Powered Radiology Assistant</li> <li>MEDIAGE™ Biological Age Measurement System</li> <li>KenSci Platform</li> <li>Enlitic Platform</li> <li>Aging.AI</li> <li>YOUNG.AI</li> <li>PathAI Platform</li> <li>Buoy Health Platform</li> <li>Haut.AI</li> <li>Haut.AI Skin Health</li> <li>Digital Nutrition Platform</li> <li>PROSCIA Platform</li> <li>Freenome Platform</li> <li>BenevolentAI Platform</li> <li>Better Therapeutics Platform</li> <li>Tempus Platform</li> <li>iCabonX Platform</li> </ul>	<ul style="list-style-type: none"> <li>TruDiagnostic™ Epigenetic Test Kit</li> <li>Cell Science Systems</li> <li>ZYMO RESEARCH: DNAge™ Epigenetic Aging Clock</li> <li>CHRONOMICS</li> <li>BioViva: DNAge® Test</li> <li>EpiLiver</li> <li>TELOYEARS: TeLoYears + Advanced Ancestry Tests</li> <li>Epigenetic Age Analysis Version 2.0</li> <li>EpiAging</li> <li>EpiSocialpsych</li> <li>Targeted Seq. for DNA Methylation Analysis</li> <li>X LIFE LENGTH: Telomere Length and Biological Age Testing</li> <li>EpiBreast</li> </ul>
<ul style="list-style-type: none"> <li>smartDNA: Microba Insight™</li> <li>GENOVA: GlycanAge Test</li> <li>TETRA: Gut Microbiota Biohacker</li> <li>VIOME: Viome Gut Intelligence™ Test</li> <li>toxiomiRTM: Biomarkers of Toxicity</li> <li>osteoimiRTM: Validated Bone Biomarkers</li> <li>thrombomiRTM: Biomarkers of Platelet Function</li> </ul>		
<ul style="list-style-type: none"> <li>smartDNA: Microbiome Test</li> <li>GENOVA: Genetic Age Test</li> <li>ARUP: Metabolism Panel, Inflammation Panel, Organ Damage Panel, Cardiovascular II Panel, Oncology II Panel</li> <li>ARUP: Neurology Panel, Neuros Exploratory Panel, Cell Regulation Panel, Cardiovascular I Panel, HumanMAP v.2.0</li> <li>ARUP: NeuroMAP v.1.0, ImmunoMAP v.1.0, Explorer MAP v.1.0</li> <li>ARUP: InflammationMAP v.1.0, CytokineMAP B, CytokineMAP A</li> <li>ARUP: LEGENDplex Human CD8/NK Panel, LEGENDplex Human B Cell Panel</li> <li>ARUP: Cytometry, Cytometry, Cytometry, Cytometry</li> <li>ARUP: LEGENDScreen Human PE Kit, LEGENDplex Human Th Cytokine Panel</li> </ul>		

