Precision Medicine Clinics Landscape Overview 2019 Most Advanced Clinics Technologies and Methods

www.aginganalytics.com

AGING ANALYTICS AGENCY

Table of Contents

Within the scope of the report, the following topics will be prioritised and analysed in-depth:

Diagnostic and Prognostic Technologies

- Best methods and available technologies for the precise assessment of current biological age
- Optimized panel of biomarkers of aging
- Modern methods and technologies for advanced full diagnostics
- Methods and technologies for prognostic assessment of required treatments and preventative interventions
- Modern approaches and methods for precise monitoring of state-of-health
- Artificial Intelligence for Precision Preventive medicine

Major Priorities of Modern Preventive and Restorative Precision Medicine

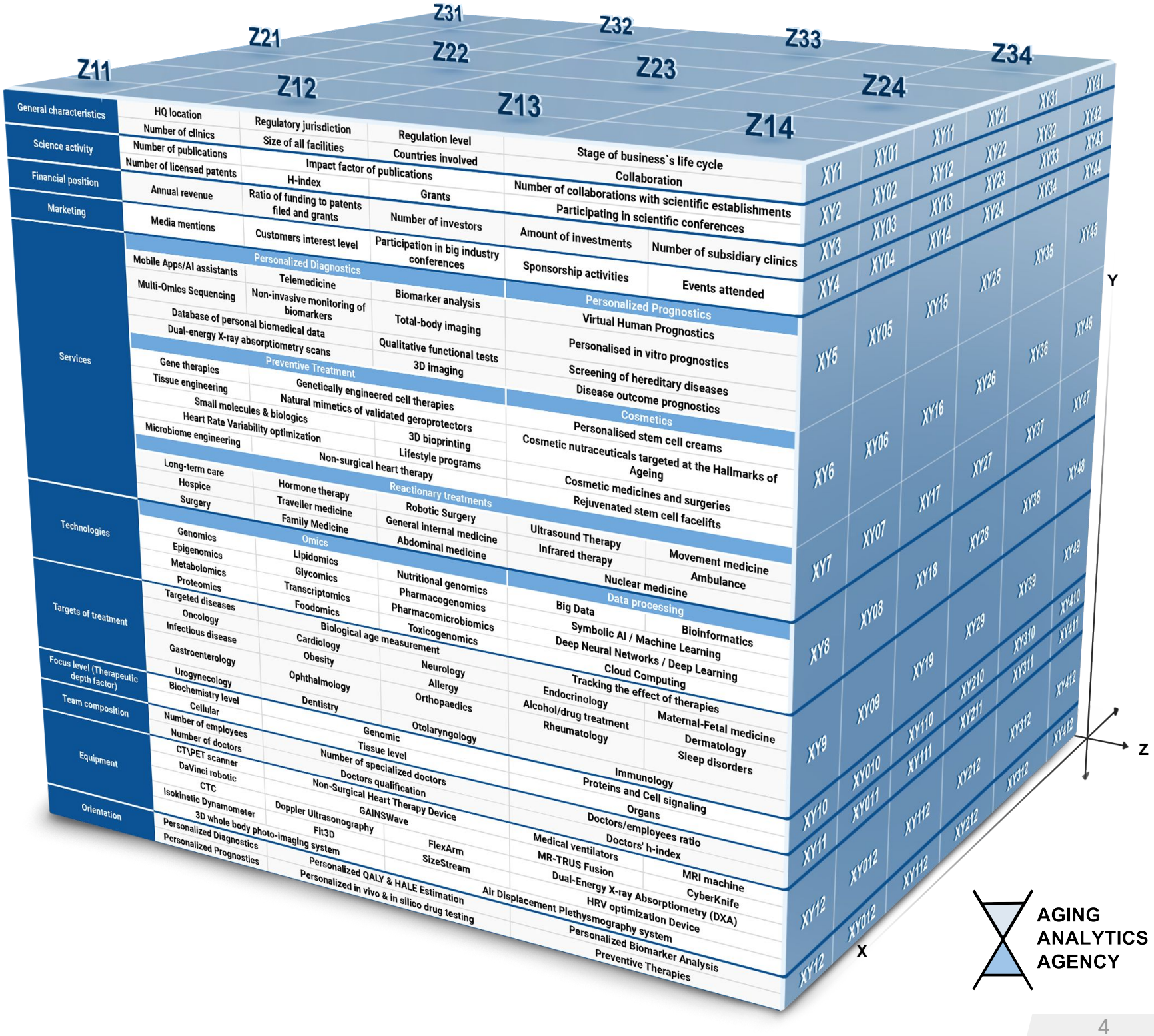
- Microbiota (methods of analysis, treatments and optimization; diets)
- Microbiome
- Nutraceuticals
- Geroprotectors
- DNA analysis
- Stem Cells
- SleepTech
- Blood
- Endocrine System
- NeuroTech
- Weight and Fat Optimization
- Viruses
- Chronic inflammation
- Immunology
- Cardiovascular health

Special Cases

- BioHackers (the best working methods and technologies)
- BeautyTech (modern technologies for rejuvenation of skin and face in particular)
- Modern Fitness Programs (the best exercise regimens and methods of optimized personalized fitness programs)
- Pets Life Extension & Health Optimization
- Guide to the Assembly of the Optimal P3 Medicine Clinic (assessment of required budget and other crucial elements)

Precision Medicine Clinics 3D Analytical Framework

Aging Analytics Agency believes that the effective analysis of as complex and multidimensional an industry as Precision Medicine Clinics requires the application of an equally multidimensional analytical framework. This analytical framework presented in the present white paper includes metrics for identifying the breadth of the industry, identifying the degree of technological development, staff professionalism, range of provided services, financial position and scientific activity.



Precision Medicine Clinics Industry Analytical Framework

General characteristics	Financial position	Marketing	Technologies	Services	Orientation	Focus level (Therapeutic depth factor)	Team composition	Science activity	Equipment		Targets of treatment	
											Targeted diseases	Alcohol/drug treatment
											Biological age measurement	Dermatology
									CT\PET scanner	CTC	Tracking the effect of therapies	Gastroenterology
HQ location									Non-Surgical Heart Therapy Device	Doppler Ultrasonography	Oncology	Ophthalmology
Regulatory jurisdiction								Number of publications	Medical ventilators	FlexArm	Cardiology	Orthopaedics
Regulation level					Personalized Diagnostics	Biochemistry level	Number of employees	Impact factor of publications	MRI machine	Isokinetic Dynamometer	Neurology	Rheumatology
Countries involved	Annual revenue	Media mentions		Personalized Prognostics	Personalized QALY & HALE Estimation	Genomic	Number of doctors	Number of licensed patents	DaVinci robotic	Dual-Energy X-ray Absorptiometry (DXA)	Endocrinology	Sleep disorders
Number of clinics	Ratio of funding to patents filed and grants	Customers interest level		Personalized Diagnostics	Personalized Biomarker Analysis	Proteins and Cell signaling	Number of specialized doctors	Number of collaborations with scientific establishments	GAINSWave	Fit3D	Maternal-Fetal medicine	Urogynecology
Size of all facilities	Number of investors	Participation in big industry conferences		Preventive Treatment	Personalized Prognostics	Cellular	Doctors/employees ratio	H-index	HRV optimization Device	SizeStream	Infectious disease	Dentistry
Stage of business`s life cycle	Amount of investments	Sponsorship activities	Data processing	Reactionary treatments	Personalized in vivo & in silico drug testing	Tissue level	Doctors qualification	Grants	MR-TRUS Fusion	Air Displacement Plethysmography system	Obesity	Otolaryngology
Collaboration	Number of subsidiary clinics	Events attended	Omics	Cosmetics	Preventive Therapies	Organs	Doctors' h-index	Participating in scientific conferences	CyberKnife	3D whole body photo-imaging system	Allergy	Immunology

SERVICES							
Reactionary treatments	Nuclear medicine	Infrared therapy	Ultrasound Therapy	Movement medicine	Abdominal medicine	General internal medicine	Robotic Surgery
	Ambulance	Family Medicine	Traveller medicine	Hormone therapy	Surgery	Hospice	Long-term care
Preventive Treatment	Microbiome engineering	Lifestyle programs	Non-surgical heart therapy	Heart Rate Variability optimization	3D bioprinting	Natural mimetics of validated geroprotectors	
	Small molecules & biologics	Tissue engineering	Genetically engineered cell therapies	Cell therapies	Gene therapies		
Personalized Diagnostics	3D imaging	Dual-energy X-ray absorptiometry scans	Total-body imaging	Non-invasive monitoring of biomarkers	Multi-Omics Sequencing		
	Qualitative functional tests	Database of personal biomedical data	Biomarker analysis	Telemedicine	Mobile Apps/AI assistants		
Cosmetics	Rejuvenated stem cell facelifts	Cosmetic medicines and surgeries	Cosmetic nutraceuticals targeted at the Hallmarks of Ageing	Personalised stem cell creams			
Personalized Prognostics	Disease outcome prognostics	Screening of hereditary diseases	Personalised in vitro prognostics	Virtual Human Prognostics			
TECHNOLOGIES							
Omics	Toxicogenomics	Pharmacomicrobiomics	Pharmacogenomics	Nutritional genomics	Foodomics		
	Transcriptomics	Glycomics	Lipidomics	Proteomics	Metabolomics		
Data processing	Bioinformatics	Cloud Computing	Deep Neural Networks / Deep Learning	Symbolic AI / Machine Learning	Big Data		

AGING ANALYTICS AGENCY

Precision Medicine Clinics Industry Analytical Framework

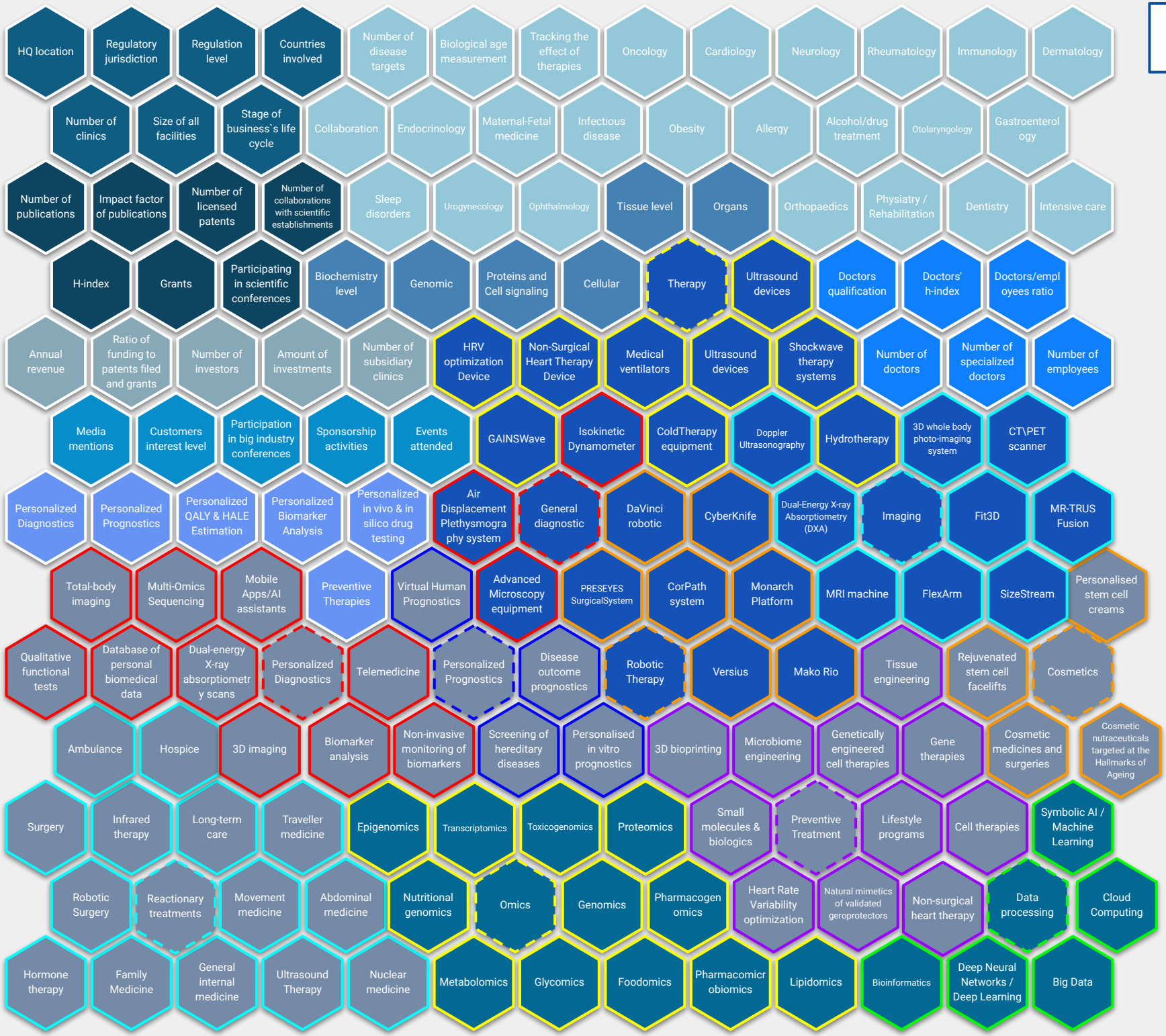
General characteristics	HQ location	Regulatory jurisdiction	Regulation level	Stage of business`s life cycle	
	Number of clinics	Size of all facilities	Countries involved	Collaboration	
Science activity	Number of publications	Impact factor of publications		Number of collaborations with scientific establishments	
	Number of licensed patents	H-index	Grants	Participating in scientific conferences	
Financial position	Annual revenue	Ratio of funding to patents filed and grants	Number of investors	Amount of investments	Number of subsidiary clinics
Marketing	Media mentions	Customers interest level	Participation in big industry conferences	Sponsorship activities	Events attended
Services	**Personalized Diagnostics**			**Personalized Prognostics**	
	Mobile Apps/AI assistants	Telemedicine	Biomarker analysis	Virtual Human Prognostics	
	Multi-Omics Sequencing	Non-invasive monitoring of biomarkers	Total-body imaging	Personalised in vitro prognostics	
	Database of personal biomedical data		Qualitative functional tests	Screening of hereditary diseases	
	Dual-energy X-ray absorptiometry scans		3D imaging	Disease outcome prognostics	
	Preventive Treatment			**Cosmetics**	
	Gene therapies	Genetically engineered cell therapies		Personalised stem cell creams	
	Tissue engineering	Natural mimetics of validated geroprotectors		Cosmetic nutraceuticals targeted at the Hallmarks of Ageing	
	Small molecules & biologics		3D bioprinting		
	Heart Rate Variability optimization		Lifestyle programs	Cosmetic medicines and surgeries	
	Microbiome engineering	Non-surgical heart therapy		Rejuvenated stem cell facelifts	
	Reactionary treatments				
	Long-term care	Hormone therapy	Robotic Surgery	Ultrasound Therapy	Movement medicine
	Hospice	Traveller medicine	General internal medicine	Infrared therapy	Ambulance
	Surgery	Family Medicine	Abdominal medicine	Nuclear medicine	
Technologies	**Omics**			**Data processing**	
	Genomics	Lipidomics	Nutritional genomics	Big Data	Bioinformatics
	Epigenomics	Glycomics	Pharmacogenomics	Symbolic AI / Machine Learning	
	Metabolomics	Transcriptomics	Pharmacomicrobiomics	Deep Neural Networks / Deep Learning	
	Proteomics	Foodomics	Toxicogenomics	Cloud Computing	
Targets of treatment	Targeted diseases	Biological age measurement		Tracking the effect of therapies	
	Oncology	Cardiology	Neurology	Endocrinology	Maternal-Fetal medicine
	Infectious disease	Obesity	Allergy	Alcohol/drug treatment	Dermatology
	Gastroenterology	Ophthalmology	Orthopaedics	Rheumatology	Sleep disorders
	Urogynecology	Dentistry	Otolaryngology	Immunology	
Focus level (Therapeutic depth factor)	Biochemistry level	Genomic		Proteins and Cell signaling	
	Cellular	Tissue level		Organs	
Team composition	Number of employees	Number of specialized doctors		Doctors/employees ratio	
	Number of doctors	Doctors qualification		Doctors' h-index	
Equipment	CT\PET scanner	Non-Surgical Heart Therapy Device		Medical ventilators	MRI machine
	DaVinci robotic	GAINSWave		MR-TRUS Fusion	CyberKnife
	CTC	Doppler Ultrasonography	FlexArm	Dual-Energy X-ray Absorptiometry (DXA)	
	Isokinetic Dynamometer	Fit3D	SizeStream	HRV optimization Device	
	3D whole body photo-imaging system		Air Displacement Plethysmography system		
Orientation	Personalized Diagnostics	Personalized QALY & HALE Estimation		Personalized Biomarker Analysis	
	Personalized Prognostics	Personalized in vivo & in silico drug testing		Preventive Therapies	

AGING ANALYTICS AGENCY

Precision Medicine Clinics Industry Analytical Framework

General characteristics	HQ location	Regulatory jurisdiction	Regulation level	Stage of business`s life cycle	
	Number of clinics	Size of all facilities	Countries involved	Collaboration	
Science activity	Number of publications	Impact factor of publications		Number of collaborations with scientific establishments	
	Number of licensed patents	H-index	Grants	Participating in scientific conferences	
Financial position	Annual revenue	Ratio of funding to patents filed and grants	Number of investors	Amount of investments	Number of subsidiary clinics
Marketing	Media mentions	Customers interest level	Participation in big industry conferences	Sponsorship activities	Events attended
Services	Personalized Diagnostics			Personalized Prognostics	
	Preventive Treatment			Cosmetics	
	Reactionary treatments				
Technologies	Omics			Data processing	
Targets of treatment	Targeted diseases	Biological age measurement		Tracking the effect of therapies	
	Oncology	Cardiology	Neurology	Endocrinology	Maternal-Fetal medicine
	Infectious disease	Obesity	Allergy	Alcohol/drug treatment	Dermatology
	Gastroenterology	Ophthalmology	Orthopaedics	Rheumatology	Sleep disorders
	Urogynecology	Dentistry	Otolaryngology	Immunology	
Focus level (Therapeutic depth factor)	Biochemistry level	Genomic		Proteins and Cell signaling	
	Cellular	Tissue level		Organs	
Team composition	Number of employees	Number of specialized doctors		Doctors/employees ratio	
	Number of doctors	Doctors qualification		Doctors' h-index	
Equipment	CT\PET scanner	Non-Surgical Heart Therapy Device		Medical ventilators	MRI machine
	DaVinci robotic	GAINSWave		MR-TRUS Fusion	CyberKnife
	CTC	Doppler Ultrasonography	FlexArm	Dual-Energy X-ray Absorptiometry (DXA)	
	Isokinetic Dynamometer	Fit3D	SizeStream	HRV optimization Device	
	3D whole body photo-imaging system		Air Displacement Plethysmography system		
Orientation	Personalized Diagnostics	Personalized QALY & HALE Estimation		Personalized Biomarker Analysis	
	Personalized Prognostics	Personalized in vivo & in silico drug testing		Preventive Therapies	

AGING ANALYTICS AGENCY

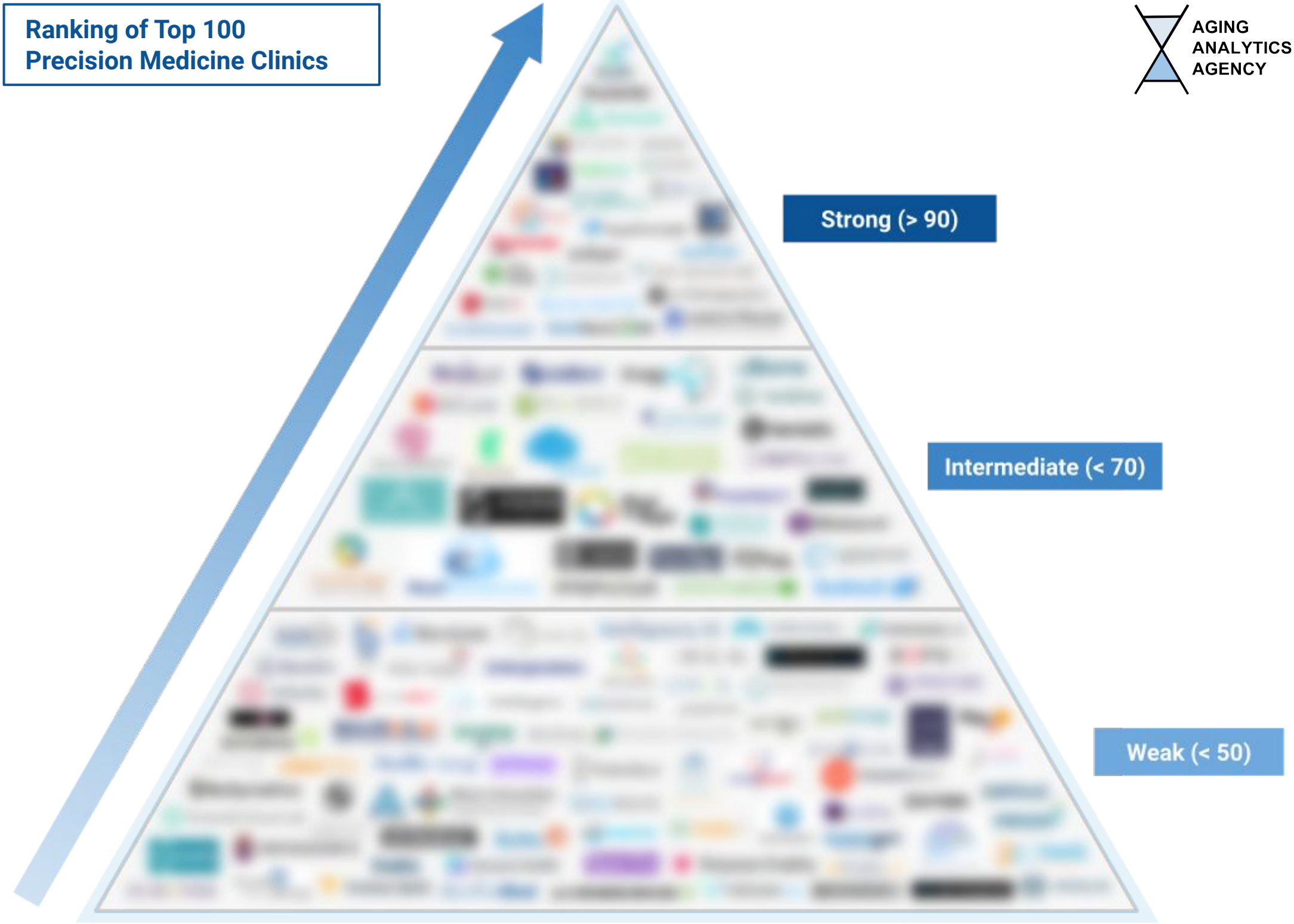


Precision Medicine Clinics Analytical Framework

- **Focus level (Therapeutic depth factor)**
- **Targets of treatment**
- **Team composition**
- **Orientation**
- **Marketing**
- **Financial position**
- **Science activity**
- **General characteristics**
- **Services**
  - Personalized Diagnostics
  - Personalized Prognostics
  - Preventive Treatment
  - Reactionary treatments
  - Cosmetics
- **Technologies**
  - Omics
  - Data processing
- **Equipment**
  - Imaging
  - General diagnostic
  - Therapy
  - Robotic Therapy

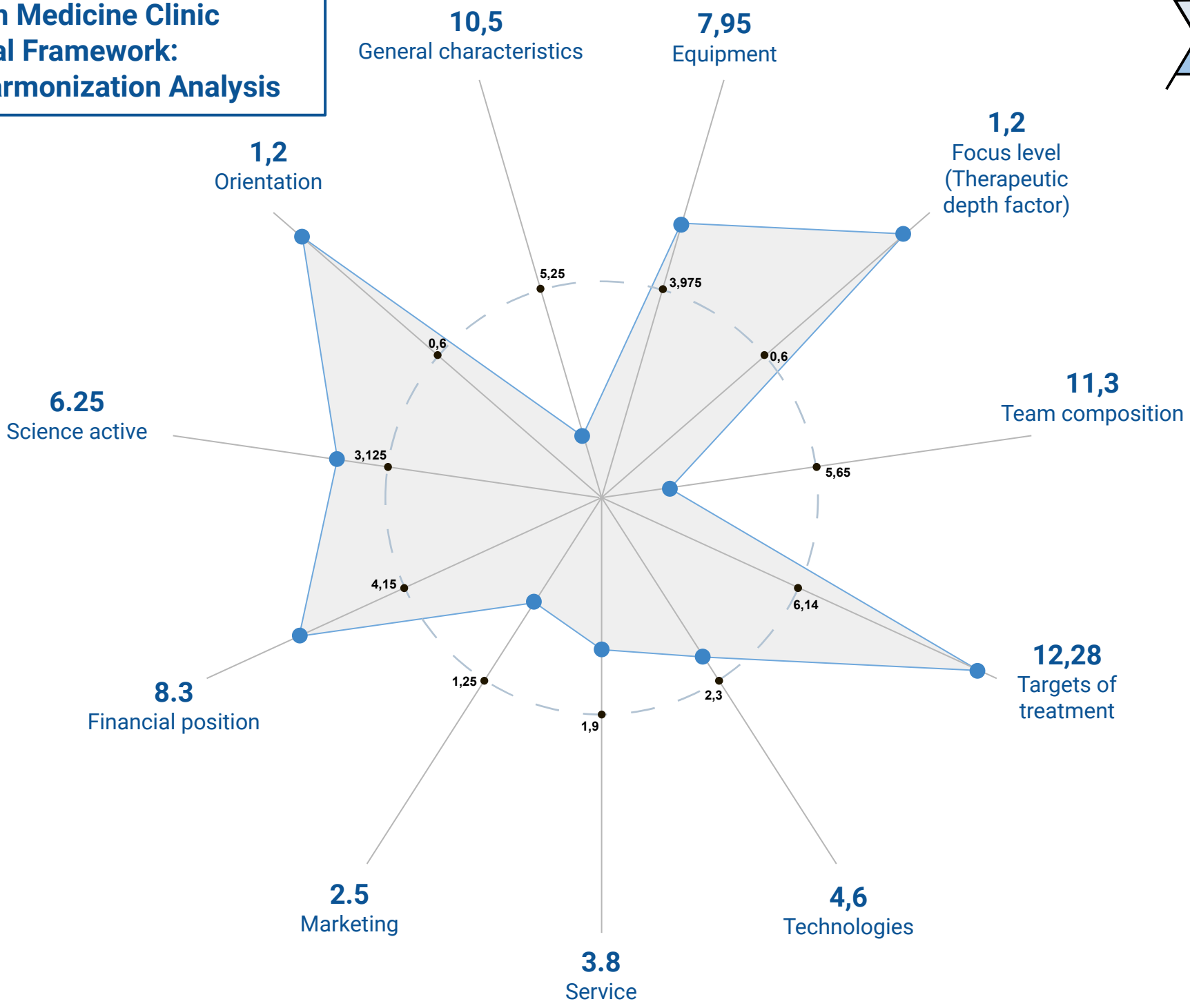
Ranking of Top 100 Precision Medicine Clinics

AGING ANALYTICS AGENCY



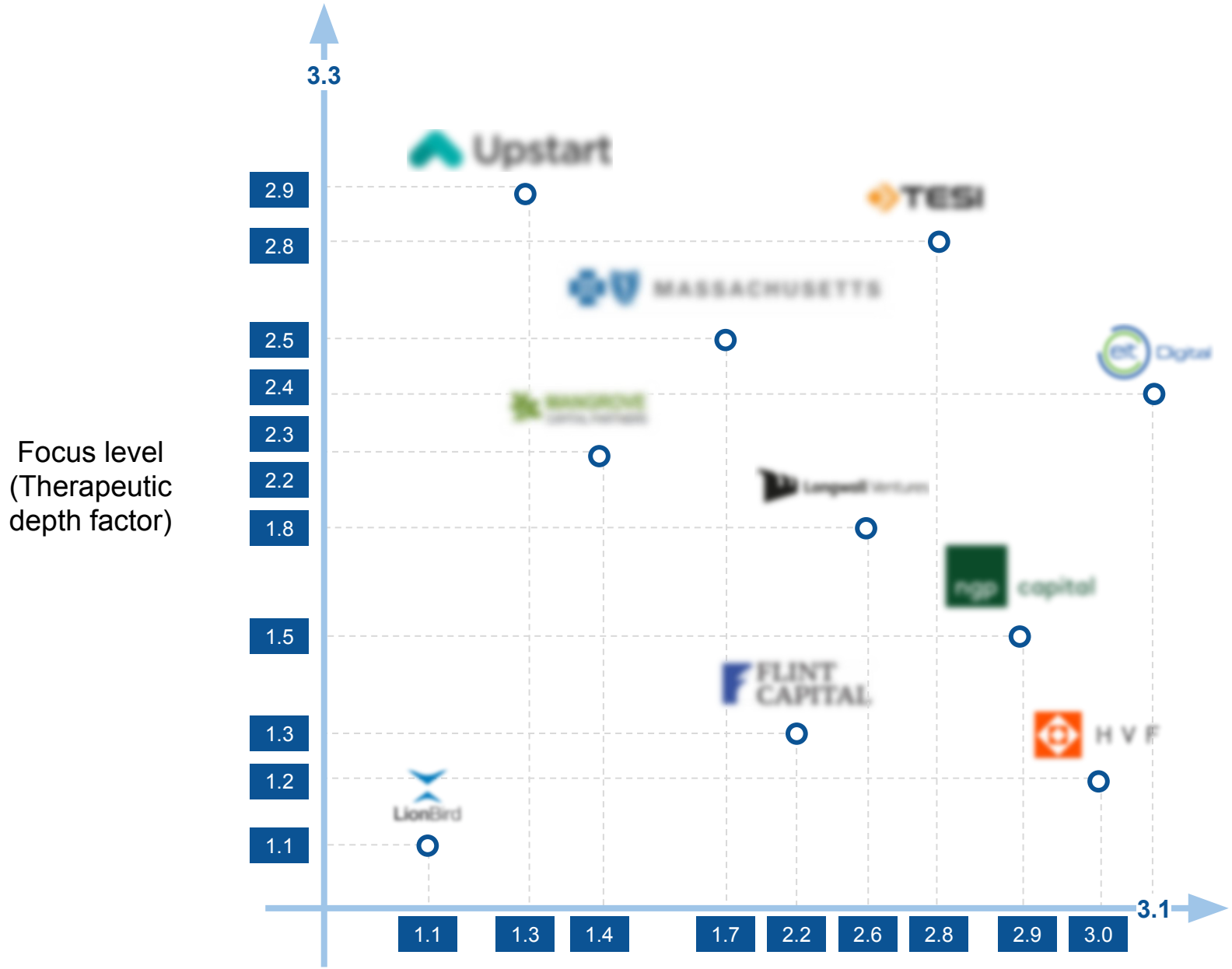
Precision Medicine Clinic Analytical Framework: Clinic Harmonization Analysis

AGING ANALYTICS AGENCY



Precision Medicine Clinic Product and Service Pipeline Therapeutic Depth vs. Breadth Analysis

AGING ANALYTICS AGENCY



Precision Medicine Clinics Industry Analytical Framework

- General characteristics
- Science activity
- Financial position
- Marketing
- Services
- Targets of treatment
- Focus level (depth factor)

Technology Readiness Level (TRL)

9	Commercialized
8	Pre-Production
7	Field Test
6	Prototype
5	Bench/Lab Testing
4	Detailed Design

Technology Readiness Levels (TRL) are a common measure of how close a technology is for practical use, used in many engineering disciplines.
By applying it to progressive medicine, we can forecast how long it will take a given therapeutic or technology to witness practical applications in the clinic or home. The darkness of each hexagon represents its TRL, with darker colors indicating a low TRL and brighter colors indicating a high TRL.
All technologies and therapeutics shown here have a TRL between 8-9.

Overview of the Progressive Model of P3 Medicine Platform

AGING ANALYTICS AGENCY

Personalisation and precision of diagnostics, prognostics and treatment for individual patients

Healthy lifespan extension and ageing processes reversal to a young state

01 Access to advanced preventive restorative medicine technologies

- Safe testing of novel therapies on individual`s stem cells, skin and other organs

02 Personalized longevity programs

- Personalised diagnostics, prognostics and therapeutics
- Virtual human body for health monitoring

03 Health management by world leading experts

- Continuous health monitoring by the world leading experts

Ideal Integrated Assembly of Precision Health Clinic Pipeline

AGING ANALYTICS AGENCY

AI-Driven Precision Diagnostics

- Multi-Omic Sequencing
- Continuous monitoring powered by Big Data Analytics
- Continuous monitoring of health state based on changes in biomarkers of aging

AI-Driven Advanced Prognostics

- AI-driven prognostics
- Advanced biomarker-based prognostics
- AI-driven predictive prognostics based on personalized multi-omics

Personalised Treatment Optimization

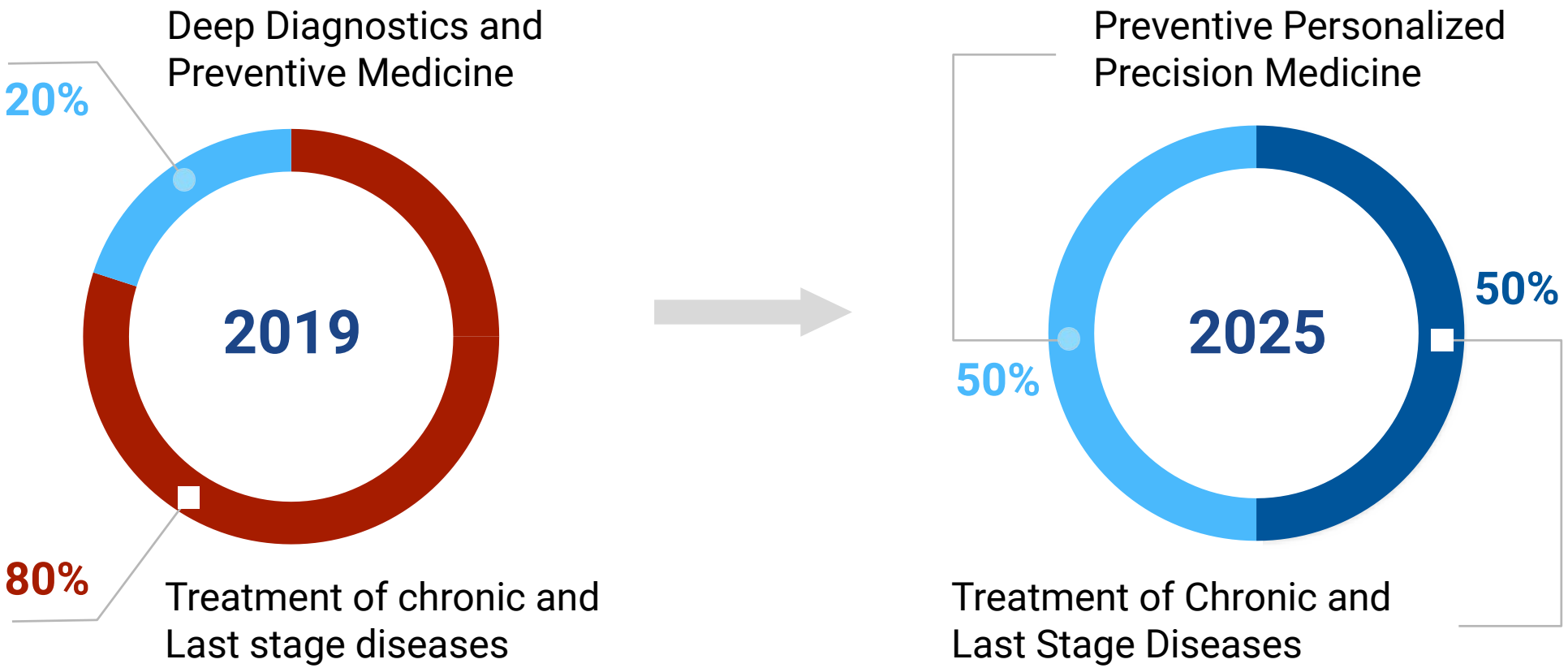
- AI-driven *in silico* personalised treatment optimization
- AI-driven personalised in vivo drug optimization
- Treatment optimization based on patient genetics

AI-Driven Preventative Treatment

- Maintenance state of precision health through preventive medicine
- AI-based predictions of optimal drug combination

Paradigm Shift from Treatment to Prevention

AGING ANALYTICS AGENCY



The New Frontier — from Precision Medicine to Precision Health

AGING ANALYTICS AGENCY

Deep Diagnostics and Preventive Medicine

Prevention of Pathologies at the Early Stage

Stabilized State of Health and Biological Age

Optimized Function of Immune System

Precision Diagnostics

AGING ANALYTICS AGENCY

Digital avatar visualizes a combination of biomarkers and other diagnostic results

Collect your data today:

- Blood samples
- Biomarker analysis
- Database of personal biomedical data stored on blockchain

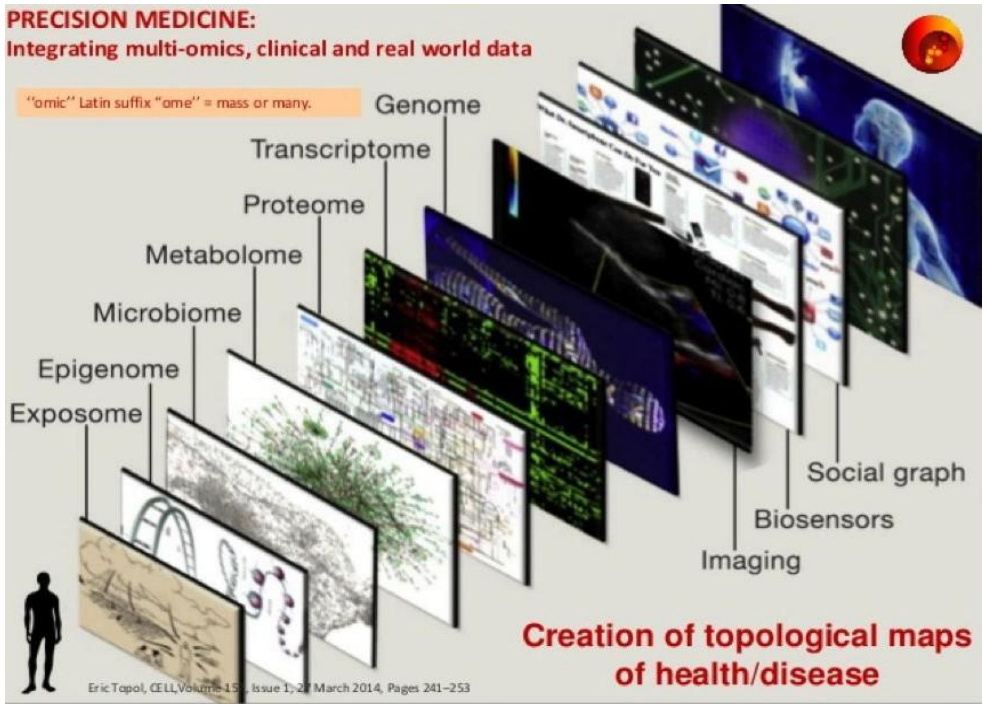
Future benefits:

- Data driven analysis of biomarkers dynamics over time
- Analyse the changes in your digital avatar
- Personalized interventions

Precision Diagnostics

AGING ANALYTICS AGENCY

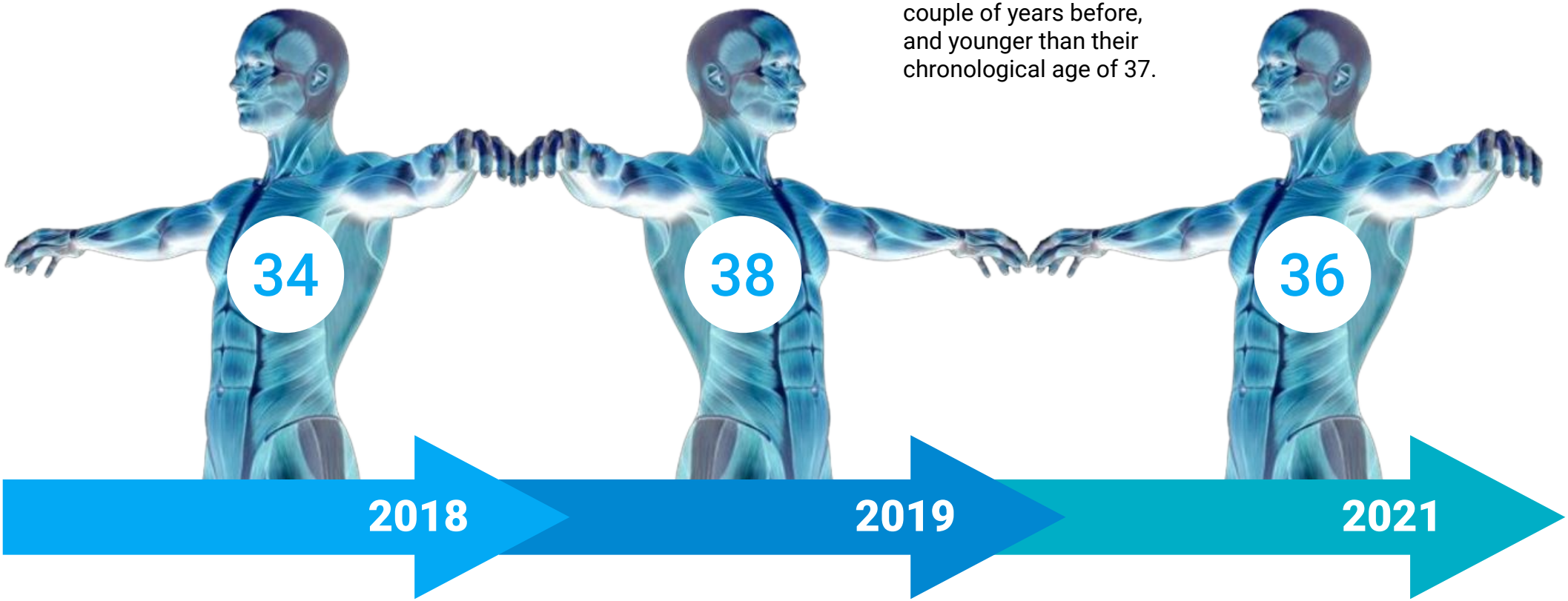
- Multi-Omics Sequencing
- Non-invasive continuous monitoring of biomarkers
- Multi-modal total-body imaging
- Qualitative functional tests
- Whole-body and organ specific biological age calculation based on biomarkers
- 3D integration of cross-sectional tissue and organ imaging



Young.AI is one such digital avatar, powered by AI to take biological data and assess patient health and age. The power of taking patient information and plugging into an AI-driven, digital environment is that not only does it enable insights impossible to obtain otherwise, but it allows for a powerful analysis of all these layers of data **over time.**

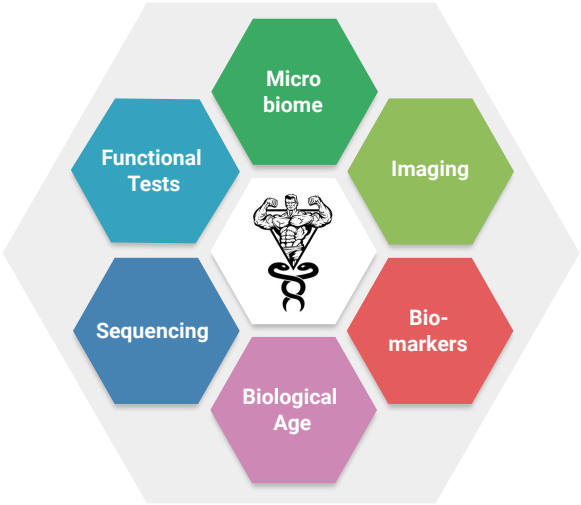
A truly 3D visualisation of patient health includes time, and follows not only deteriorations but also improvements over custom timeframes that allow interpretation based on personal circumstances including changing lifestyle, trialling treatments, etc. As such, a patient may be able to see how their body has been changing over 5 years in terms of health, function, biological age, etc.

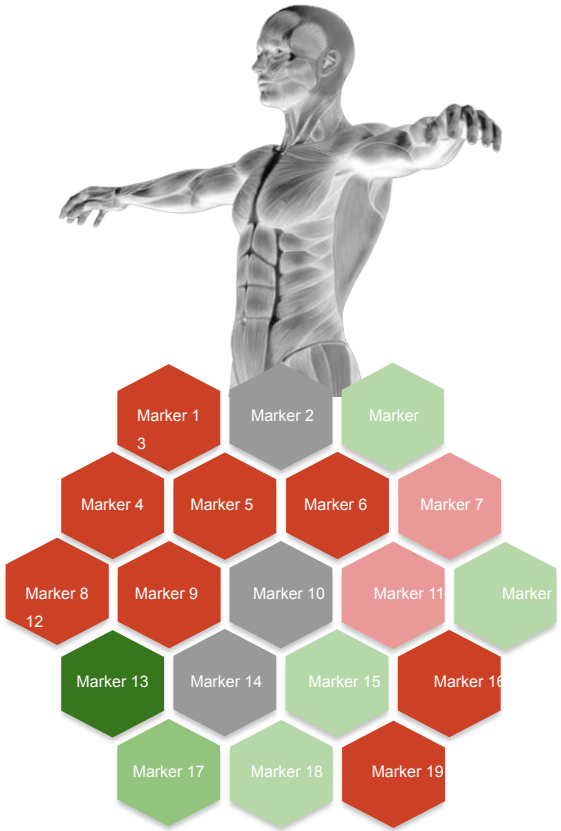
A patient may see that their **biological age** is 36 in 2021 — younger than a couple of years before, and younger than their chronological age of 37.

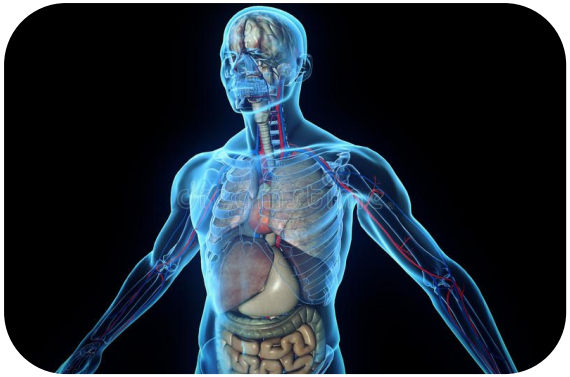


Diagnostics Panel for Digital Avatar

AGING ANALYTICS AGENCY







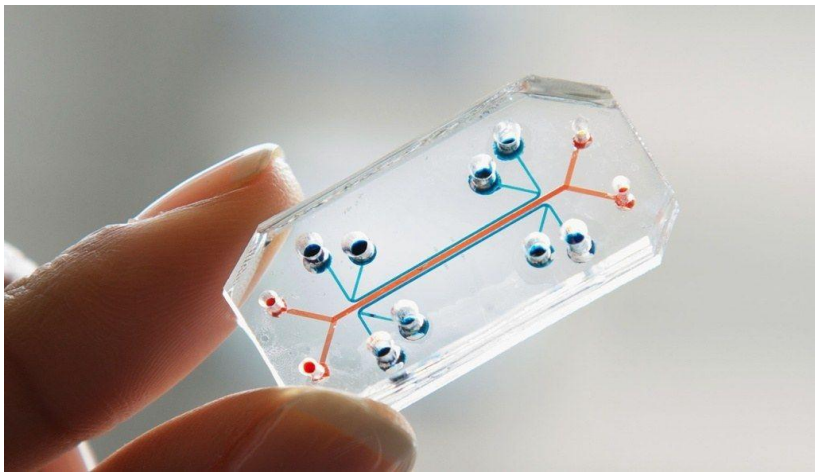
Biomarker panel

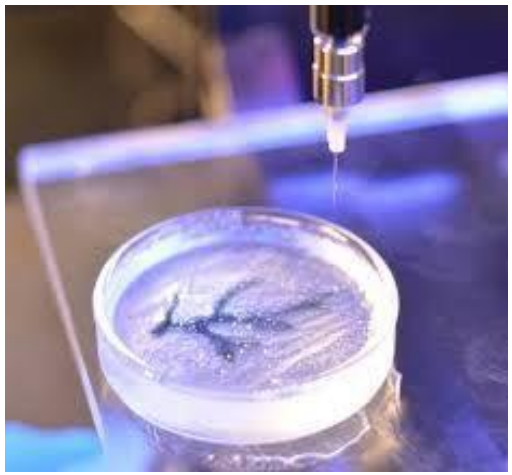
Time

Personalized Experimentation

AGING ANALYTICS AGENCY

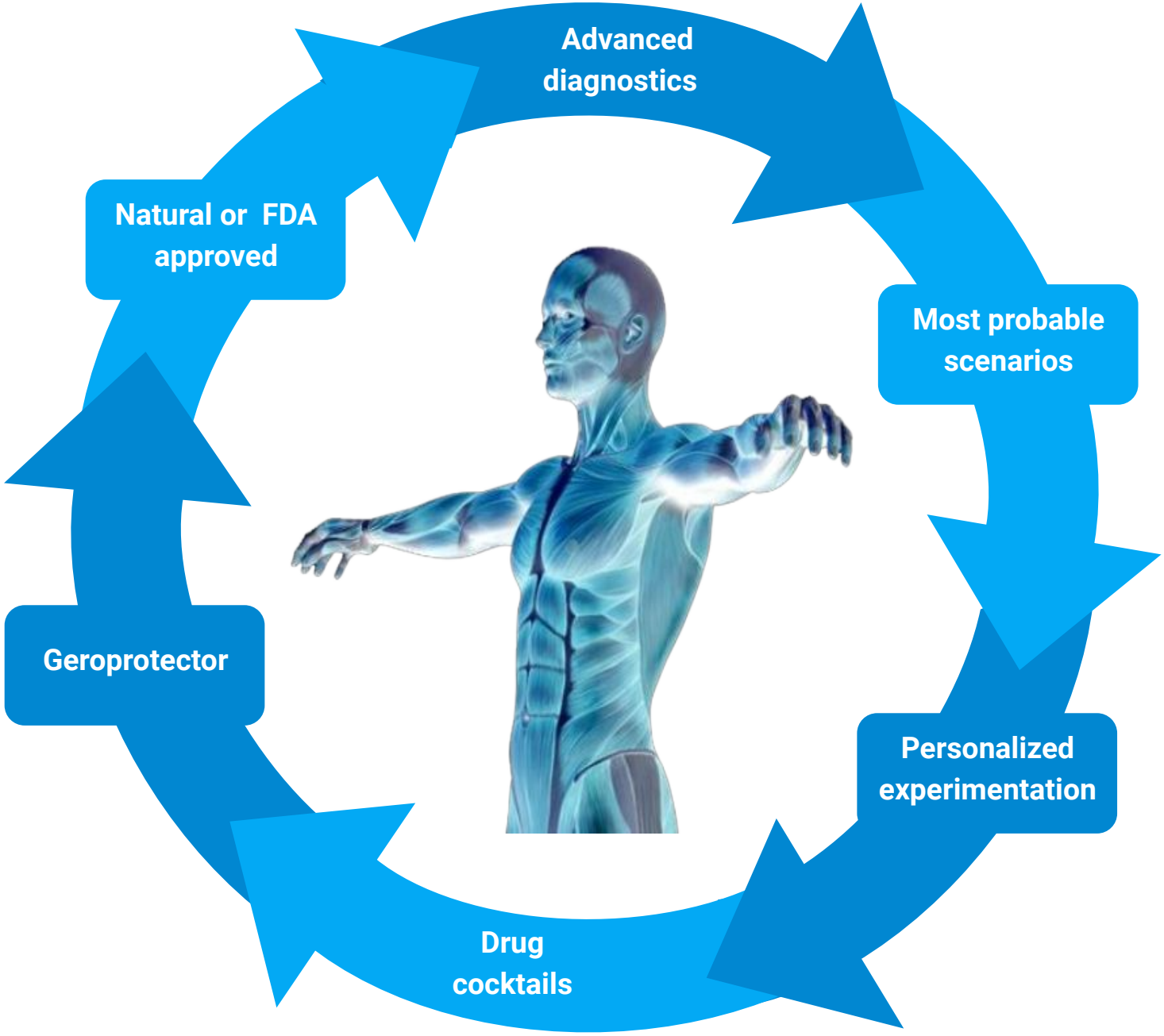
- Intelligent *in silico* experimentation
- Personalised *in vivo* experimentation on human cells
- Organ-on-a-chip systems
- Real time tracking of changes in health and aging biomarkers in response ongoing treatments
- Personalised ex *vivo* experimentation on 3D bioprinted tissues and organs using patient-specific cells
- AI based personalized biomarker development and drug response profiling via Deep Learning and Generative Adversarial Networks



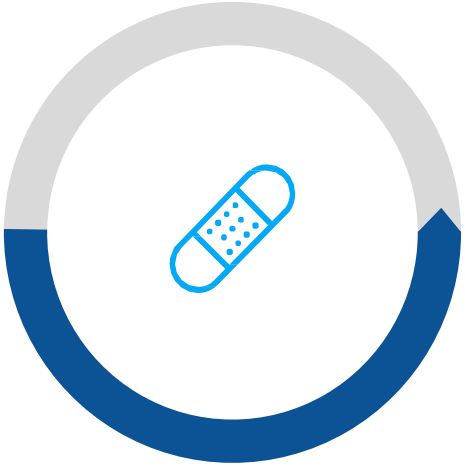


Personalized Experimentation

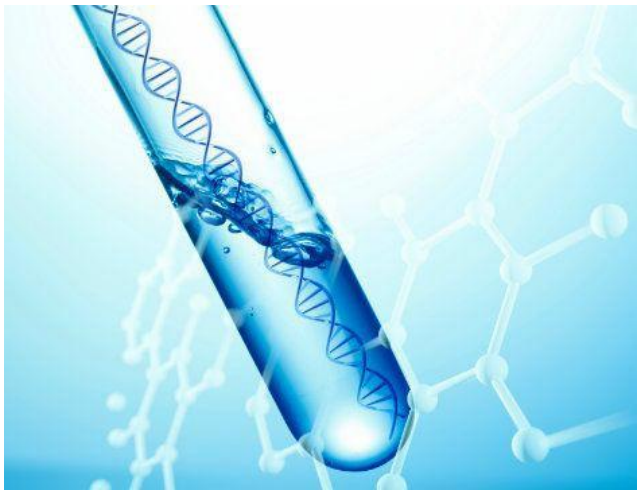
AGING ANALYTICS AGENCY



Preventive Treatment



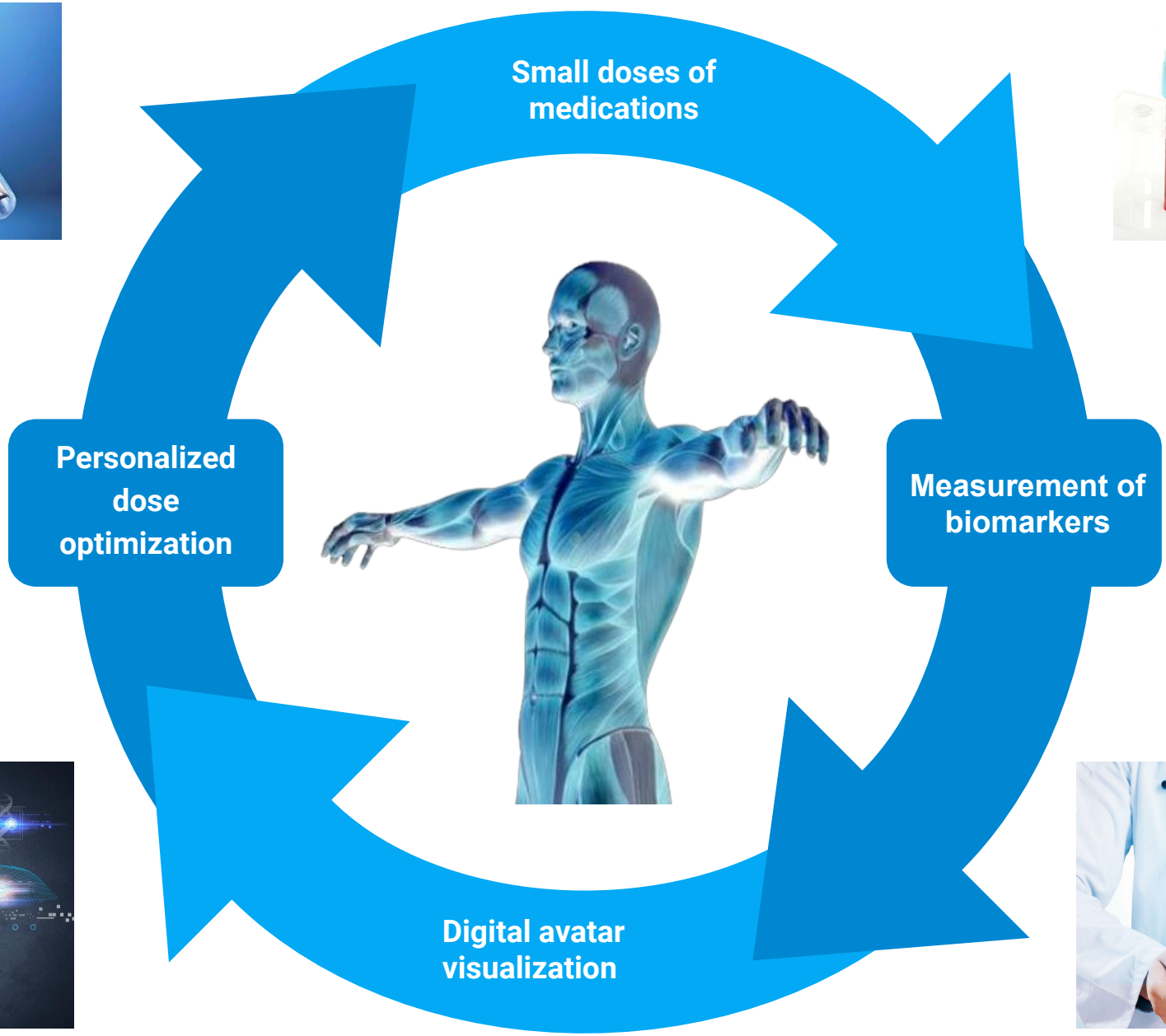
- Gene therapies
- Cell therapies
- Tissue engineering
- Small molecules & biologics
- Natural mimetics of validated geroprotectors (e.g. metformin, rapamycin)
- Genetically engineered cell therapies
- 3D bioprinting
- Microbiome engineering

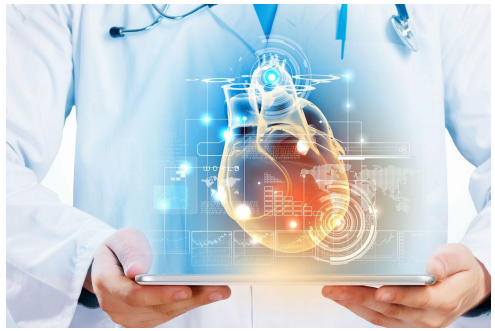


Preventive Treatment

AGING ANALYTICS AGENCY

New intervention





Report Value Proposition

1. **What leading personalised and preventive therapies, diagnostics, prognostics, technologies and techniques can clinics add to their existing pipeline to maximize their competitive advantage?**
2. **What it the optimal assembly of advanced precision health technologies and services , and how can it be integrated into clinics' existing scope of produces and services in the most ideal manner?**
3. **What techniques and technologies will become market-ready in the 3-5 year horizon? What technologies should be should be watched closely for integration into clinics' existing pipelines within the next several years?**

We feel that our efforts over the course of the past five years have established a solid foundation of knowledge and expertise upon which we intend to begin our biggest project to date: the production of a new report entitled ***Precision Medicine Landscape Overview 2019: Most Advanced Clinics, Technologies and Methods.***

This will be a 1,000 page report aiming to answer these three specific questions, to be produced over the next 3-6 months, with a new edition of this report during each financial quarter, incrementally increasing its breadth and depth as we go along, and with each edition providing a deeper, more comprehensive and more precise understanding of the landscape. It will deliver:

- Concrete deep analysis of which technologies and therapies are available today,
- Tangible estimations of what we can expect in 3-5 years horizon, which new technologies and treatments will be market-ready by 2020-2022,
- Practical guide to the optimized pathway for assembling the best possible combination of technologies and treatments today and tomorrow.

The parties who will have early access to this report will gain deep expertise on how they can optimize their clinics' strategic, technological and scientific prospects in order to deliver the most sophisticated and comprehensive precision health products and services for their clients.

Aging Analytics Agency is primarily interested in strategic collaboration with international corporations, organisations and governments of progressive countries on projects and initiatives related to Longevity.

Aging Analytics Agency is open to engage 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, if it fits our interests, Aging Analytics Agency is open to co-sponsoring research and analytics for the production of both internal and openly-access industry reports and special case studies on the topics of Longevity, Precision Health, Personalized Medicine, Digital Health, Blockchain in Healthcare as well as other advanced topics.

www.aginganalytics.com info@aginganalytics.com