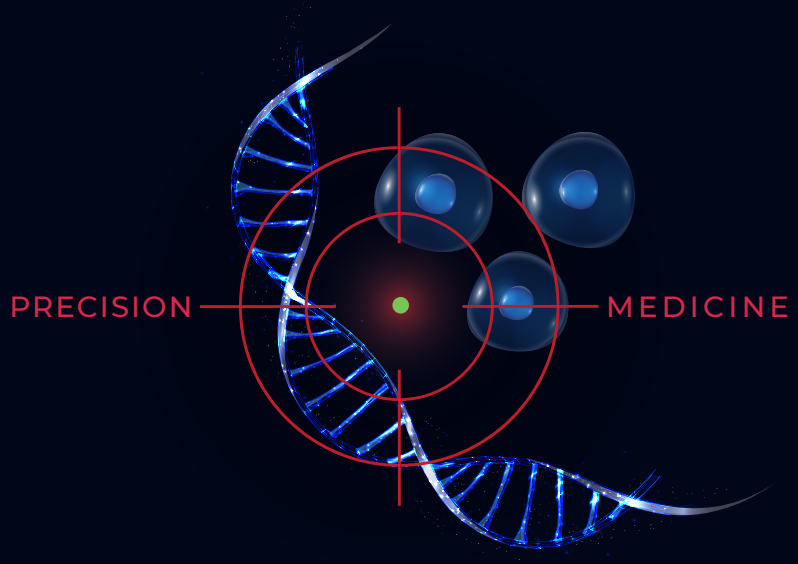
BIOSCIENCE
INSTITUTE



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BIOSPACE

BIOSCIENCE INSTITUTE

A GLOBAL LEADER IN CLINICAL, MOLECULAR & CELL BIOLOGY

Since 2007, BIOSCIENCE INSTITUTE has been at the forefront of clinical, molecular, and cell biology for the early detection, prevention, and molecular management of aging and cancer.

A GLOBAL NETWORK OF EXCELLENCE

Our laboratories operate across three international innovation hubs:

- ✓ **HARVARD MEDICAL SCHOOL - Life Lab (Boston, USA)**
- ✓ **UNIVERSITY OF ROME (Italy)**
- ✓ **DUBAI HEALTHCARE CITY (UAE)**

PROPRIETARY HIGH-SENSITIVITY PROTOCOLS DESIGNED TO

- ✓ **Reveal the molecular drivers of aging and cancer**
- ✓ **intercept physio-pathological changes before they become pathological**
- ✓ **Support targeted, precision-based preventive strategies**

BIOSCIENCE INSTITUTE

uniquely integrates three core scientific domains to deliver unmatched diagnostic and regenerative solutions:

- ✓ **Clinical Biology – advanced medical laboratory science and translational diagnostics**
- ✓ **Molecular Biology – ultra-deep cfDNA sequencing, genomics, and multi-omics analytics**
- ✓ **Cell Biology – GMP-certified stem-cell platforms, secretome and exosome technologies**

The convergence of these three domains generates unprecedented opportunities for longitudinal health optimization and molecular disease interception.

REDEFINING LONGEVITY MEDICINE & CANCER PREVENTION

By integrating multi-omics diagnostics, regenerative biotechnology, and AI-enhanced translational research, BIOSCIENCE INSTITUTE is pioneering a new era of molecular longevity - empowering clinicians and patients to act on the earliest biological signals of aging and disease.

BIOXPACE PROTOCOL

ADDRESSING THE ROOT CAUSES OF AGING AND CANCER

BIOXPACE introduces a new paradigm in MOLECULAR LONGEVITY by overcoming the core weaknesses of traditional anti-aging protocols. Rather than relying on symptom-oriented therapies, fragmented datasets, or non-modifiable biomarkers, **BIOXPACE** integrates multi-omics diagnostics, AI-driven interpretation, and longitudinal clinical decision support into a single, scalable ecosystem.

Continuous exposure to endogenous and environmental stressors - such as oxidative stress, radiation, micro- and nanoplastics, and lifestyle-related genotoxins - constantly injures the genome. The body responds through the DNA Damage Response (DDR), a sophisticated surveillance and repair network essential for maintaining genomic integrity.

By optimizing DDR efficiency and monitoring genomic instability over time, **BIOXPACE** enables truly preventive, precision interventions - addressing the biological drivers of aging and cancer before clinical disease emerges.

BIOXPACE IS THE FIRST FULLY INTEGRATED MOLECULAR LONGEVITY OPERATING SYSTEM, redefining longevity clinics by elevating them from wellness services to advanced precision-medicine centers through the delivery of:

- ✓ **CAUSE-FOCUSED, NOT SYMPTOM-FOCUSED MEDICINE**
- ✓ **ACTIONABLE, AGING-SPECIFIC MULTI-OMICS**
- ✓ **LONGITUDINAL MONITORING AND MEASURABLE OUTCOMES**
- ✓ **PERSONALIZED INTERVENTIONS BASED ON REAL BIOLOGICAL DRIVERS**

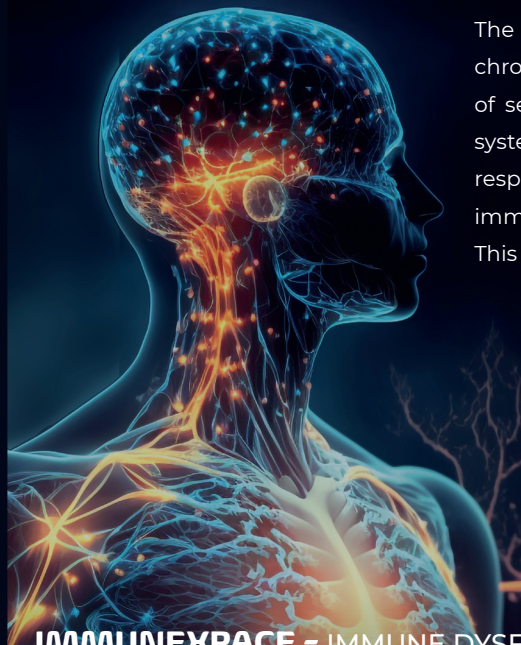
Where conventional longevity programs are inconsistent and fail to build patient loyalty, **BIOXPACE** provides:

- ✓ **A unified diagnostic platform**
- ✓ **Standardized therapeutic algorithms**
- ✓ **A cloud-based CDSS that synchronizes all clinics**
- ✓ **A turnkey model that clinics can implement immediately**

This enables any advanced clinic to deliver Harvard-level molecular longevity services with consistent, reproducible quality.

CLINICAL BIOLOGY ASSESSMENT

CYTOXPACE – CHRONIC LOW-GRADE SYSTEMIC INFLAMMATION



The analysis of pro-inflammatory cytokines allows the detection of chronic systemic inflammation, often induced by the accumulation of senescent cells that are not effectively cleared by the immune system. These cells release SASP factors that trigger inflammatory responses, promoting genomic instability, tissue dysfunction, and immune dysregulation.

This condition-known as inflammaging-is a key biological driver of accelerated aging and age-related diseases such as diabetes, atherosclerosis, neurodegeneration, and cancer. Cytokine profiling enables quantification of inflammatory burden, early identification of risk states, and personalization of anti-inflammatory, senotherapeutic, and immunomodulatory strategies.

Monitoring these markers helps prevent functional decline and supports healthy longevity.

IMMUNEXPACE – IMMUNE DYSFUNCTION & SYSTEMIC VULNERABILITY

Clinical Value - Identifies early immune decline and supports personalized immune-remodulation to maintain tissue integrity and eliminate senescent or damaged cells.

Immune efficiency is essential for clearing senescent cells through senolytic mechanisms mediated by NK cells, macrophages, and T lymphocytes. When this function declines, senescent cells accumulate, driving chronic inflammation, accelerated aging, and age-related disease (cancer, fibrosis, neurodegeneration). Assessing immunocompetence-particularly cytotoxicity and inflammatory response-allows clinicians to detect early immunosenescence and guide personalized immune-remodulation interventions.

A well-functioning immune system is essential for eliminating damaged cells, preventing toxin accumulation, and maintaining tissue equilibrium. Evaluating immune functionality is therefore fundamental to optimizing anti-aging strategies and promoting resilient, healthy longevity.

SYSTEMIC DRIVERS OF AGING

SENEXPACE – CELLULAR SENESCENCE & MOLECULAR AGING

Senescence biomarkers enable risk stratification, monitoring of senotherapeutic interventions, and personalization of regenerative strategies. Senescent cells are metabolically active but irreversibly growth-arrested cells that progressively accumulate with age. Their persistence fosters a pro-inflammatory and pro-tumorigenic microenvironment through SASP - Senescence-Associated Secretory Phenotype - secretion, driving tissue dysfunction, systemic inflammation, immunosuppression, genomic instability, and the progression of chronic and oncological diseases.

Assessing their presence and activity through specific biomarkers (FGF 21, GFAT, NFL, GDF 12) provides insight into the biological state of aging, helps identify high-risk individuals, and supports longitudinal monitoring of therapeutic or regenerative interventions. The analysis of senescence markers is therefore a fundamental instrument for tailoring anti-aging strategies and guiding the targeted application of regenerative, senotherapeutic, and preventive approaches.

GUTXPACE – GUT DYSBIOSIS & PRO-INFLAMMATORY PROFILE

Microbiome analysis provides insight into eubiosis versus dysbiosis, reflecting the balance of intestinal bacterial communities. An altered microbiome is associated with increased intestinal permeability, immune activation, chronic systemic inflammation, and production of toxic metabolites-all factors that accelerate biological aging. These alterations contribute to age-related conditions such as type 2 diabetes, obesity, cardiovascular disease, cancer, and neurodegeneration. 16S rRNA sequencing enables detailed mapping of microbial composition, identification of specific dysbiosis patterns, and definition of personalized interventions including probiotics, nutritional strategies, and immunomodulation. Evaluating the microbiome allows early intervention to restore balance and promote longevity.

AGING AND CANCER

WITH A SIMPLE

DNA
Damage

DDR
DNA Damage Response

TP53
Activation

DNA REPAIR

APOPTOSIS

TP53 DEFICIENCY → **DRIVER MUTATION**

The progressive accumulation of somatic mutations-damage that is not repaired by the DNA Damage Response (DDR) and is driven by the inactivity of tumor-suppressor genes-manifests as genomic instability, the fundamental driver of cancer.

DDR DEFICIENCY → **PASSENGER MUTATIONS**

When the DDR becomes insufficient or dysfunctional, DNA lesions are not properly repaired. This leads to the accumulation of somatic passenger mutations, escalating genomic instability and genotoxicity

SENESCENT CELLS-SASP → **MICRO/NANO PLASTIC** → **SYSTEMIC INFLAMMATION**

Damaged cells that accumulate DNA injuries enter senescence and release pro-inflammatory molecules (SASP). These signals fuel chronic, low-grade systemic inflammation - an effect further amplified by the presence of micro-nanoplastics in the body.

PRECISION

MESENCHYMAL STEM CELL

DRIVER MONITORING

BLOOD SAMPLE

PROGRESSIVE ACCUMULATION → **GENOMIC INSTABILITY** → **CANCER**

Longitudinal monitoring of somatic mutations enables the investigation of genomic instability, an indicator of tumor-suppressor gene inactivity, and therefore allows for effective CANCER DRIVER INTERCEPTION.

GENOMIC INSTABILITY → **GENOTOXICITY** → **STEM CELL IMPAIRMENT**

Increased genotoxicity, and progressive stem-cell impairment accelerate biological aging, diminish regenerative capacity, and heighten susceptibility to age-related diseases, including cancer.

AGING

IMMUNE DEFICIENCY → **GUT BACTERIA IMBALANCE** → **DDR IMPAIRMENT**

The immune system loses its ability to eliminate senescent cells while the gut microbiota drifts into dysbiosis. These shifts amplify systemic inflammation and drive the DDR impairment and aging.

THERAPY

GENOTOXICITY - FREE FOOD SUPPLEMENT

EXPOSOME-DRIVEN BIOLOGICAL DAMAGE

HELIXPACE

GENOMIC INSTABILITY FROM DRIVER SOMATIC MUTATIONS

NGS of cfDNA enables real-time monitoring of molecular aging and age-related disease evolution. Driver somatic mutations are acquired DNA alterations that accumulate over time in response to endogenous and exogenous genotoxic stress.

When they exceed a critical threshold, these mutations generate genomic instability-a central mechanism driving cellular and tissue aging, promoting senescence, and acting as a molecular driver of age-related diseases, particularly cancer.

Their assessment is performed via Next-Generation Sequencing (NGS) on circulating cell-free DNA (cfDNA) extracted from plasma, enabling non-invasive detection of the frequency and clonal distribution of mutations in genes involved in DNA repair, cell-cycle checkpoints, apoptosis, and proliferation. his approach supports monitoring of the molecular evolution of aging and its associated diseases.

HELIXBALANCE

GENOTOXICITY FROM PASSENGER SOMATIC MUTATIONS

Role in Aging

Early detection of cumulative genotoxic exposure enables proactive preventive interventions Passenger somatic mutations are non-oncogenic DNA alterations that accumulate with age due to genotoxic exposure and decreased repair efficiency.

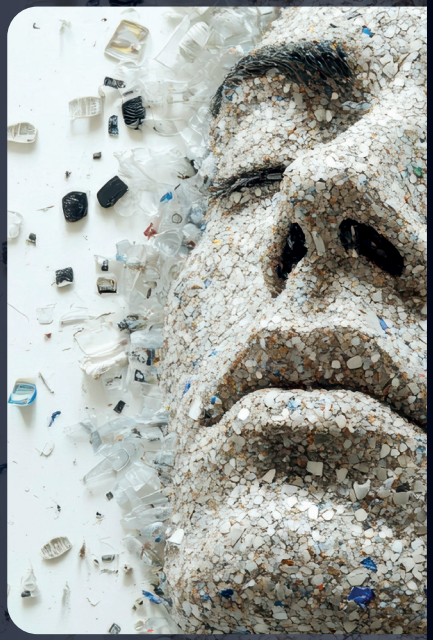
They represent a form of “silent genetic scar,” serving as a molecular memory of genomic instability. Although initially neutral, these mutations progressively impair cellular functions, promoting tissue dysfunction and organ decline. They are key markers of cellular aging and predictors of age-related diseases such as cancer, neurodegeneration, and cardiovascular disorders.

Their identification enables early assessment of genotoxic exposure profiles and implementation of targeted preventive strategies.

MOLECULAR DRIVERS OF AGING

GENOXPACE - GENOTOXICITY AS A DRIVER OF AGING

Non-invasive quantification of systemic genotoxicity to guide prevention, detoxification, and regenerative interventions. Accumulation of genotoxic damage and oxidative stress is a key cause of cellular aging. These processes compromise genome stability, hinder DNA repair, and induce senescence, dysfunctional apoptosis, and chronic inflammation-ultimately contributing to age-related diseases including neurodegeneration, cardiovascular disease, and cancer. **GENOXPACE** enables non-invasive quantification of systemic genotoxicity and oxidative stress, providing dynamic indicators of biological risk. Measuring these parameters allows early detection of DNA damage caused by environmental exposures or lifestyle factors, guiding personalized strategies for prevention, detoxification, and regeneration. Intervening before damage becomes disease is now possible.



NANOXPACE

MICRO / NANOPLASTICS ACCUMULATION

- ✓ **Mitochondrial dysfunction**
- ✓ **Oxidative stress**
- ✓ **Immune disruption**
- ✓ **Endocrine interferents**

Scientific evidence shows that microplastics (MPs) and nanoplastics (NPs), introduced through air, water, and food, can cross biological barriers, accumulate in tissues, and disrupt cellular homeostasis. They induce chronic inflammation and indirect genotoxicity through oxidative stress, mitochondrial dysfunction, and immune alterations. These effects represent molecular drivers of accelerated aging and age-related diseases such as metabolic disorders, neurodegeneration, and cancer.

Peripheral blood analysis allows quantification of the individual plastic burden and incorporates environmental exposome evaluation into preventive medicine. Clinical effects include gut dysbiosis, oxidative damage, and release of endocrine disruptors. The test allows early identification of at-risk individuals and implementation of personalized strategies.

THERAPIES

GENOTOXICITY-FREE FOOD SUPPLEMENT VERTICAL-FARM MADE	FUNCTIONS AND INDICATIONS
 **GENEXAFE** - Choline bitartrate; Chlorella algae; Flavincanus polyphenols; B-group vit.; Haematococcus algae - Astaxanthin; NADH; Vitamin D.	Counters the biological processes associated with cellular senescence by providing metabolic support and protection against free radicals and oxidative stress.
 **CYTOXAFE** - Curcuma longa L., Curcuminoids; Sanctodefence, eugenol; Chlorella algae, selenium; Haematococcus - Astaxanth	Helps regulate systemic inflammation (low-grade inflammation) by modulating oxidative and pro-inflammatory mediators.
 **BIOXAFE** - Igeapro Echinacea; Spirulina thallus, zinc; Resveratrol; Triticum aestivumL., spermidine; Vit. D3.	Exhibits immunomodulatory and antioxidant activity, supporting both innate and adaptive immune responses through the synergistic action of its ingredients.
 **MYCROGENOX** - Berberine; Ginger (Zingiber, rhizome), gingerols; Silyguards – Milk thistle, silymarin; Tyndallized lactobacilli.	Promotes intestinal microbiota balance, supports hepatic and digestive function, and helps counter dysbiosis and low-grade inflammatory phenomena.

MESENCHYMAL STEM CELLS AND EXOSOMES

Bioscience Institute's GMP-certified cell factories supply stem cells and exosomes to address systemic and localized physiopathological conditions - and the associated degenerative processes-revealed by the BIOXPACE protocol.

KEY PROPERTIES OF MESENCHYMAL STEM CELLS (MSCS)

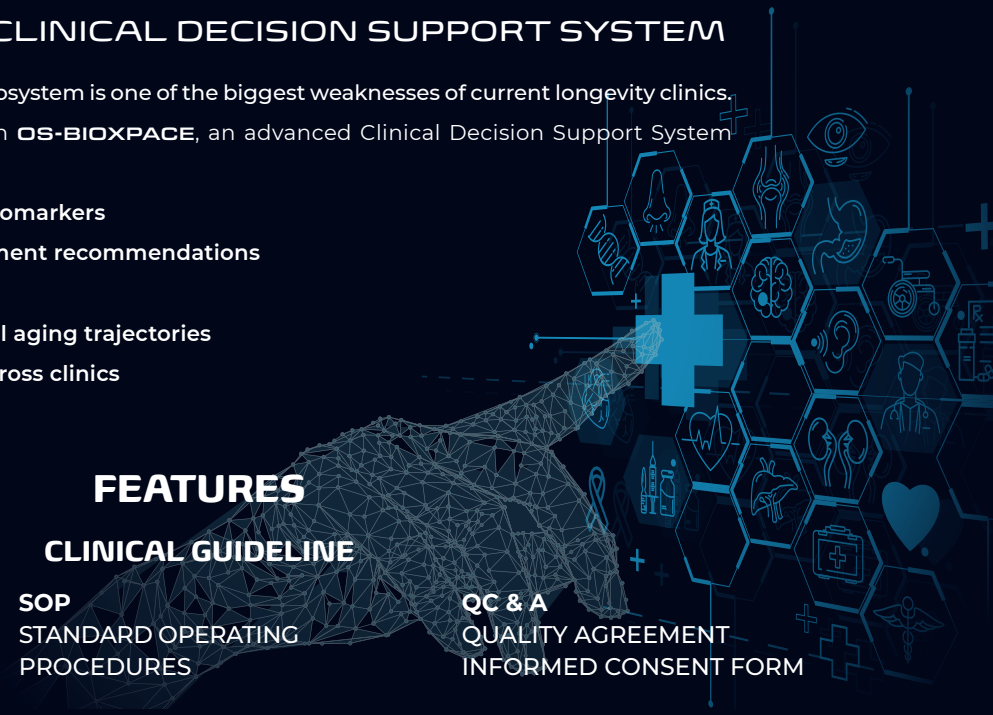
- ✓ ***Regenerative*: promote tissue repair and cellular renewal.**
- ✓ ***Immunomodulatory*: balance inflammatory and immune responses.**
- ✓ ***Anti-inflammatory*: reduce chronic and systemic inflammation.**
- ✓ ***Paracrine*: release bioactive factors and exosomes that drive healing.**

OS - BIOXPACE

FULLY INTEGRATED CLINICAL DECISION SUPPORT SYSTEM

The absence of a structured digital ecosystem is one of the biggest weaknesses of current longevity clinics. **BIOXPACE** eliminates this gap with **OS-BIOXPACE**, an advanced Clinical Decision Support System that provides:

- ✓ **Longitudinal monitoring of all biomarkers**
- ✓ **Personalized Reports and Treatment recommendations**
- ✓ **Alerts for protocol adherence**
- ✓ **Predictive modeling of biological aging trajectories**
- ✓ **SOP - Standardized reporting across clinics**



FEATURES

CLINICAL GUIDELINE

CDSS
CLINICAL DECISION
SUPPORT SYSTEM

SOP
STANDARD OPERATING
PROCEDURES

QC & A
QUALITY AGREEMENT
INFORMED CONSENT FORM

EHR ELECTRONIC HEALTH RECORD SYSTEM

PATIENT DATA
COLLECTION
& MANAGEMENT

DASHBOARD
FOR DATA FOLLOW-UP
AND MONITORING

REPORT TEST
ACCESS AND DOWNLOAD
FOR LICENSEE & PATIENT

TREATMENT ADHERENCE BASED ON MEASURABLE OUTCOMES

BIOXPACE promotes adherence and long-term engagement through:

- ✓ Objective tracking of biomarker improvements by visual dashboards
- ✓ AI-driven recommendations for therapeutic adjustments
- ✓ Personalized genotoxic free food supplement, stem cells and exosome interventions
- ✓ Patients see real biological change, not just subjective improvements.

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