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??Success of the microbiome therapeutics market will require a more sophisticated investment environment?

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The microbiome market in India is experiencing significant growth, driven by increasing research activities, rising awareness of gut health, and expanding applications in therapeutics and diagnostics. With a forecasted revenue of \$282 million by the end of 2031, this sector is expected to witness advancements in microbiome-based treatments, rising investment, and a stronger focus on personalised medicine. Additionally, harnessing the human microbiome, and the emerging science of microbiome-mitochondria crosstalk, holds tremendous promise as a foundation for preventing and reversing disease. To learn more details about the growth of this sector, BioSpectrum recently spoke to Sushant Kumar, Founder, Genefitletics, a company that focuses on providing early detection tests for metabolic diseases and cancer, utilising advanced technologies like next-generation sequencing and machine learning.



Since the company's inception in 2020, what has the journey been like?

Founded in 2020, Genefitletics entered the disease diagnostic space with an audacious vision: *What if we could identify abnormalities in cellular energetics before dysfunction manifests, and rewrite the cell's bioelectric code to drive large-scale anatomical goals?*

Over the last seven years, Genefitletics has processed over 35 billion data points to map the critical communication network between the human microbiome and mitochondria. Our findings reveal that microbial stress hijacks the energy needed for healthy aging, effectively starving longevity pathways and triggering systemic disease. This journey has yielded six paradigm-shifting scientific insights that challenge the status quo of modern healthcare.

Mitochondria: The CEO of the Cell

Health is not driven by DNA alone; chronic diseases are rarely hard-wired. The true engine of health is **mitochondrial dynamism**. Mitochondria act as information-processing motherboards, sensing microbiome signals and instructing the nucleus to modulate roughly two-thirds of human genes.

Genefitletics has commercialized a biophysics and machine learning platform that measures oral and gut microbiome functions and their crosstalk with mitochondria. By identifying the aberrant bioelectric signals underlying depolarized cell states—the hallmark of degenerative diseases and oral cancer—we deliver regenerative therapeutics that reinstate transmembrane potential.

The Mouth is the Gut

While science focuses on the gut, the salivary microbiome is the true upstream architect of internal health, "seeding" the gut via two primary pathways:

- **Direct Seeding:** Swallowing migrates oral microbes to the GI tract 2,000 times daily, shaping gut bioelectric patterns.
- **Systemic Inflammation:** Dysbiosis compromises gum barriers ("leaky gums"), allowing toxic byproducts to enter the bloodstream. This triggers systemic conditions (Type 2 diabetes, IBD, cardiovascular disease, CKD) and oncological pathologies (oral, pancreatic, and colon cancers).

Our first-of-its-kind technology in Asia maps this oral-gut-mitochondria axis to pinpoint the downstream inflammatory impacts missed by modern medicine.

Precision Nutrition as Biotherapeutics

Nutrition is not about macro-molecules; it is a complex sack of over 100,000 molecules. Because microbial protein expressions vary, there is no universal "healthy food"—identical twins can have opposite responses to the same ingredient.

Our machine learning model mathematically maps over 100 microbial and mitochondrial pathways against a 100,000+ molecule nutrition ontology. We prescribe precise, biology-based dosages of foods and transient target compounds (antioxidants, peptides, bioregulators) that update monthly based on improvement in phenotype. Supported by red-flag

models, this creates a circular feedback loop using rich, longitudinal biological data.

Function Over Diversity

Microbes possess "bioelectric memories" that dictate health trajectories. Traditional gut testing offers only static snapshots of bacterial presence (diversity), missing real-time gene expressions. For example, the probiotic *Akkermansia muciniphila*, considered to be beneficial, can contextually turn hostile, degrading the gut's protective mucin layer and triggering autoimmune responses like Multiple Sclerosis. Our platform measures actual active metabolites and real-time biochemical reactions instead of static DNA.

Bioelectric Cellular Health

Cells function as precisely tuned electrical systems balanced by trans-membrane ion movement. Genefitletics applies principles of physics to read cellular communication signals (cytokines, mitokines). By measuring subtle changes in mitochondrial energy flow, we detect when cells shift from a growth state to a survival state, identifying pathway breakdowns long before physical symptoms surface.

Health is Dynamic

Human biology constantly evolves based on environment, lifestyle, and cellular interactions. Moving away from sensor-based wearables, Genefitletics tracks the daily impact of lifestyle choices directly on molecular pathways and disease phenotypes, shifting healthcare from a reactive model to a proactive, continuous cellular optimization engine.

Could you please highlight the recent technology or product developments at Genefitletics?

Our commercialised, dual-model platform (B2C & B2B licensing) operates at the confluence of **bioenergetics and machine learning**. By shifting from late-stage diagnostic imaging (MRI, PET, biopsy) to early, mechanism-based cellular restoration, we unlock unprecedented healthcare insights missed by legacy healthtech systems.

Cellular Energetics Platform

- **The Tech:** Overlays complex mathematical physics models on massive cellular datasets.
- **The Outcome:** Detects subtle, baseline bioenergetic dysregulations before physical symptoms manifest.

Disease Detection Models (Metabolic & Chronic)

- **The Tech:** Advanced regression algorithms trained on **35B cellular data points**, 45M phenotype records, and 35K+ peer-reviewed studies.
- **The Outcome:** Maps oral/gut microbiome functions and mitochondrial crosstalk to specific disease pathways with **80% sensitivity and 80% specificity**.
- **Current Capabilities:** Early detection of Type 2 Diabetes, Cardiovascular Disease, Chronic Kidney Disease, IBD, Gum Disease, and Oral Cavities.

Energy Resistance Model

- **The Tech:** Dynamic visualization of the body's total energy budget allocation (Vital Functions vs. Growth-Repair-Maintenance vs. Stress Responses).
- **The Outcome:** Clearly differentiates optimal health from high/chronic stress states.

Multi-Cancer Early Detection Platform

- **The Tech:** Combines biophysics, multi-omics, and ML trained on **10B cellular datasets**, 5M phenotype records, and 40K+ studies to measure mitochondrial energetic breakdowns.
- **Current Capabilities:** Detects **Oral Cancer at the pre-tumor stage**.
- **Pipeline:** Expanding to early-detection mechanisms for Brain, Colon, Pancreatic, and Breast cancers.

Computation-Driven Regenerative Therapeutics

- **The Tech:** Proprietary computational modeling focused on remodeling the cell's bioelectric network.
- **The Outcome:** Reprograms dysfunctional/cancer cells and restores coherent cellular communication.

Closed-Loop Reinforcement Learning

- **The Tech:** Structured monthly longitudinal feedback loops.
- **The Outcome:** Generates continuous Real-World Evidence (RWE) to dynamically refine AI-driven therapeutic interventions across 300+ foods, prebiotics, and biotherapeutics.

What current challenges & opportunities is your company addressing with respect to the Indian healthcare market?

Modern medicine relies on a **symptomology-based framework** that focuses heavily on what goes wrong *after* a disease manifests. While this reactive, palliative approach manages plasma-level biomarkers and alleviates suffering in about 10% of cases, it remains highly ineffective and unsustainably expensive for the vast majority—frequently reducing a patient's overall healthspan.

This current systemic failure is driven by three structural blind spots:

- **Misunderstanding "Health":** Healthcare lacks dynamic, regularly paced data on the molecular, cellular, and energetic parameters that define actual health, making early prevention impossible.
- **The Gene-Centric Obsession:** The industry forces a rare-disease model (gene-protein-drug pipelines) onto chronic, degenerative diseases and cancer. This approach ignores shared molecular pathways and, crucially, the fundamental **flow of energy** that differentiates a healthy individual from a diseased one.
- **A Superficial Approach to the Microbiome:** Despite massive venture capital, gut microbiome platforms have stalled. Commercialization relies on weak correlations, scale-driven marketing, and unvalidated over-the-counter (OTC) supplements. Current sequencing technologies lack functional depth, ignoring how microbial byproducts actively communicate with host cells and mitochondria.

The real-world consequence of these blind spots is clear: rising out-of-pocket costs and escalating premature mortality rates, particularly among younger populations.

At **Genefitletics**, we are bridging these gaps through a proprietary bioenergetics and machine learning platform that shifts the paradigm from managing symptoms to restoring cellular intelligence.

How It Works

Rather than attempting to fix genetic mutations or engineer physical tissues, our platform focuses on the foundational driver of health: **cellular energy**.

- **Functional Analysis:** We analyze real-time microbiome functions and cellular pathways to identify exactly where and why mitochondrial energetic processes are breaking down.
- **Bioelectric Reprogramming:** Our computational model drives regenerative therapeutics that remodel the cell's bioelectric network, effectively reprogramming dysfunctional or cancerous cells back to health.
- **Longitudinal Tracking:** Using proprietary digital tools, patients and practitioners can track the real-time impact of interventions on cellular stress, communication networks, and energetic cascades.

By shifting the focus to cellular stressors and bioenergetic hallmarks, Genefitletics enables the early detection, prevention, and precise reversal of hard-to-identify degenerative diseases.

Are you exploring new collaborations or partnerships to strengthen your presence in the healthcare market?

We believe the chronic disease epidemic requires a **collaborative, not competitive**, approach. Over the next five years, our growth strategy focuses on partnering with traditional and new-age healthcare providers to expand platform access and help **10 million Indians reclaim their health**.

We are now open to **flexible licensing arrangements** across three core sectors:

Healthcare Practitioners & Hospitals

- **Integration:** Seamlessly embeds into clinical workflows.

- **Value:** Drives higher bed turnover and occupancy rates, optimizes care costs, and strengthens payer network engagement.

Biotherapeutics & Pharma Companies

- **Integration:** Provides exclusive access to proprietary molecular targets and cellular data.
- **Value:** Accelerates the development of precision drug formulations for degenerative diseases.

Nutrition, Microbiome & Wellness Enterprises

- **For Microbiome Companies:** Moves beyond standard DNA testing to personalize supplements using our unique bioenergetics profiling.
- **For Wellness & Longevity Brands:** Enhances offerings via our advanced therapeutic ontology database and companion regenerative therapies.

The Bottom Line: These strategic collaborations augment your existing capabilities—empowering you to deliver a **360-degree patient solution** that maximizes profitability while reducing patient care costs.

Given your expertise in the microbiome sector, how do you view the growth of the Indian microbiome industry in the coming years?

Over the coming years, I expect microbiome applications to evolve well beyond their current scope, integrating microbiome-mitochondria-organ crosstalk into a transdisease diagnostic and personalised therapeutic model. Rather than operating in isolation, this model will work alongside conventional healthcare to enable early, effective interventions for conditions that remain chronically underserved.

Today, practitioners who already use the microbiome as a diagnostic and intervention tool are running into a persistent challenge: a systemic gap between raw microbiome data and actionable clinical insights. Translating findings into meaningful interventions remains a significant bottleneck.

Looking ahead, I anticipate progress on two fronts. First, a technological shift — from rudimentary DNA-based profiling toward a richer, functional characterisation of the microbiome and its influence on bioenergetics. Second, the development of intelligent interpretation layers, much like what we have built at Genefitletics, that allow clinicians and researchers to longitudinally track how interventions affect both microbiome composition and cellular health.

Ultimately, the success of the microbiome therapeutics market hinges on a fundamental mindset shift — away from an FMCG push model and toward a research-driven, consumer-facing application model, underpinned by large-scale microbiome and phenotypic datasets. This transition will also require a more sophisticated investment environment: one where capital is channelled into forward-looking research and companion therapeutics, rather than yet another undifferentiated OTC supplement.