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"India needs sustained investment in microbiome-specific infrastructure and research"

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As microbiome science moves from the laboratory into mainstream healthcare and consumer wellness, the ability to translate complex microbial data into meaningful, personalised health insights is becoming increasingly important. In this context, BioSpectrum India took an opportunity to speak with Dr Debojyoti Dhar, Co-founder & Director, Leucine Rich Bio to understand the company's journey in microbiome science, its expanding portfolio of microbiome testing and personalised interventions, and its vision for the sector.



Please share details about the company's progress since inception, and the major products in the pipeline.

Leucine Rich Bio was incorporated in 2014, with an initial focus on genomics, systems biology and computational biology. Our work gradually moved towards microbiome science. We saw an opportunity to translate complex biological data into practical health insights. One of the key outcomes of this journey was BugSpeaks, which became South Asia's first gut microbiome test. We initially worked through research and clinical collaborations before making the test available through clinics and wellness centres. In 2020, we also opened the platform directly to consumers.

Our work has since expanded beyond the gut. We launched the Skin Microbiome Test in 2025 and are developing Oral and Vaginal Microbiome Tests. This allows us to study different microbial ecosystems and their relationship with human health. We have also built RychBiome, South Asia's first microbiome science or data based nutraceutical brand as the intervention layer of our platform. The first product in the portfolio, Rychbiome Indus was launched in 2021 and now the portfolio includes RychBiome Personalised Probiotics, RychBiome Indus Plus, Probiokids, Rychbiome microbiome balancing cream and products designed for specific age groups and lifestyles.

The direction is clear. We want to connect testing, interpretation and intervention. A microbiome test should not simply produce a report. It should help people understand their biology and take informed, personalised steps.

What are the company's growth plans for the next five years?

Over the next five years, our focus will be on building a broader microbiome health platform. We see significant potential in connecting microbiome diagnostics with personalised nutrition, targeted interventions and longitudinal monitoring. The first area of growth will be testing. We want to strengthen our presence across gut, skin, oral and vaginal microbiomes. Each ecosystem has distinct biological characteristics. Our objective is therefore to develop specialised testing and interpretation for each area.

The second area is personalised intervention. RychBiome Personalised Probiotics is an important part of this strategy. The approach is to use individual microbiome insights to guide probiotic selection. We also see potential in population-specific and

life-stage products. RychBiome Indus, for example, has been developed around the Indian gut microbiome. We are also developing solutions around different age groups and lifestyle requirements.

International expansion will be another priority. Microbiomes differ across populations because of diet, geography and lifestyle. We therefore want to build datasets that help us understand these differences rather than simply export an Indian model. The larger goal is to establish a connected platform for microbiome testing, precision nutrition and preventive health.

Microbiome science has moved beyond research and into healthcare and consumer health. How do you see the industry evolving in India?

The Indian microbiome industry is entering an important phase. The conversation is shifting from whether the microbiome matters to how this information can be used responsibly. The next stage will be driven by better data and stronger clinical validation. Identifying microbial species is no longer the only objective. The bigger question is what those patterns mean for an individual and whether they can support a meaningful intervention.

I expect microbiome science to become increasingly connected with genomics, metabolomics, clinical parameters, nutrition and lifestyle data. A single biological dataset rarely tells the complete story. Combining different layers can provide a more useful picture of an individual's health. We will also see a move away from completely generic interventions. Microbiomes differ between individuals and can change over time. The same probiotic or nutritional intervention may therefore not have the same effect in everyone.

At the same time, the industry needs scientific discipline. India has a particular advantage here. Our diversity in diets, lifestyles and populations can generate valuable microbiome datasets. If studied systematically, these datasets can contribute to global microbiome research.

Testing is now expanding across the gut, vaginal, oral and skin microbiomes. How do you see these different areas shaping the next phase of microbiome testing?

The expansion across different microbial ecosystems reflects a broader understanding of human biology. The gut is only one part of the microbiome story. Gut testing remains the most mature area. There is substantial research connecting the gut ecosystem with nutrition, metabolism and several aspects of health.

The skin microbiome provides a different perspective. It interacts closely with the skin barrier and the external environment. Skin Microbiome Test examines the microbiome profile and links the results with personalized skin care related advice.

Another interesting area is the oral microbiome. It can provide insights into microbiome balance and oral hygiene, including periodontal health. Vaginal microbiome is equally significant when it comes to research of the microbiome balance and female health. The longer-term opportunity is to understand these ecosystems together. However, an integrated view should not mean treating them as interchangeable. Each microbial community has its own biology and clinical relevance.

What are the biggest challenges in taking microbiome research from the laboratory to scalable products and solutions?

The biggest challenge is translation. Producing microbiome data is one part of the problem. Understanding what that data means for an individual is much more difficult. Microbiome composition can be influenced by diet, geography, medication, age and lifestyle. This creates significant variation between individuals and populations. A finding from one population cannot automatically be treated as a universal biological rule.

This is why population specific datasets are important for India. We need to understand how regional diets, lifestyles and environmental factors influence microbial ecosystems. Standardisation is another major challenge. Sample collection, storage, transportation and sequencing can influence the data. Bioinformatics pipelines and interpretation methods also need careful control.

Clinical validation is equally important. A correlation between a microbial pattern and a health condition does not establish causation. It also does not automatically prove that modifying that microbial pattern will improve the condition. There is a communication challenge as well. Microbiome reports can contain enormous amounts of information. Consumers do not need

thousands of microbial names. They need relevant insights, clear explanations and scientifically defensible recommendations.

For us, this is why the connection between testing and intervention matters. The objective is to move from data generation to meaningful health decisions. Our emphasis has always been on providing “actionable” reports rather than just reporting information.

India has built strong capabilities in biotechnology and genomics. What gaps still need to be addressed for India to build a stronger microbiome industry?

India has many of the fundamental strengths required to build a strong microbiome industry. We have scientific talent, biotechnology capabilities and enormous biological diversity. The biggest opportunity is to convert these strengths into larger and more structured microbiome datasets. We need longitudinal studies that capture Indian diets, regional lifestyles, environmental factors and clinical outcomes.

This is important because microbiome composition can vary across populations. India has significant diversity across regions, diets and lifestyles. That diversity can become a scientific advantage if it is studied systematically. We also need stronger collaboration between academia, healthcare institutions and industry. Microbiome science brings together microbiology, genomics, nutrition, clinical research and computational biology. These disciplines need to work together from research through product development and validation.

Finally, the country needs sustained investment in microbiome-specific infrastructure and research. Building globally relevant products is not a short-term exercise. It requires high-quality datasets, rigorous validation and long-term scientific investment. India has the opportunity to become more than a market for microbiome products. With the right ecosystem, it can become a significant contributor to the global microbiome industry.

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