

# EXPLORING NEW FRONTIERS IN HEALTH MANAGEMENT THROUGH NUTRITION RESEARCH

A nutrition company in China is **FORGING HIGH-PROFILE COLLABORATIONS WITH RESEARCHERS** to understand the mechanisms behind disease and the ageing process.

**The global focus of healthcare systems** is shifting from treatment to prevention and overall wellness. This emphasis on preventative care is spurring a new wave of research into nutrition and dietary supplements. And interest in supplements is increasing — the global market for vitamins and dietary supplements is predicted to grow from about US\$130 billion in 2021 to nearly US\$200 billion by 2028.

A nutrition company based in Zhuhai, China, is researching the potential benefits of nutritional supplements. Through its internal team of scientists and by forging collaborations, BYHEALTH aims to better understand the mechanisms driving human health and ageing and the role that nutrition plays.

“Consumers have developed diverse needs for dietary supplements and are increasingly basing their decisions on scientific evidence,” says Shuisheng Liang, vice chairman of BYHEALTH. “Technology breakthrough is key to the growth of the entire health industry, and only those companies that constantly explore the unknown and innovate can prosper in the long run.”

Since its founding in 1995, BYHEALTH's internal R&D team has grown to about 300 scientists whose expertise span clinical medicine, nutrition, pharmacology, microbiology and food science. It has established

an institute of nutrition and health with research centres in Guangzhou and Shanghai in China, and Melbourne in Australia.

## PURSuing COLLABORATIONS

The company is also building partnerships with other organizations. For example, it has established collaborations to study precision nutrition and nutritional metabolomics with the European Nutrigenomics Organisation, the Rowett Institute at the University of Aberdeen in the UK, and the Netherlands Organisation for

Applied Scientific Research, in The Hague.

The company has also teamed up with the Shanghai Institute of Nutrition and Health, part of the Chinese Academy of Sciences (CAS), to create a research centre focused on ageing and nutrition. Other alliances it has formed include a research centre at the Chinese Association of Geriatric Research — focused on nutrition intervention for elderly people with chronic diseases — and a precision nutrition research unit at the University of Chinese Academy of Sciences' Hangzhou

Institute for Advanced Study.

Over the past decade, the company's Nutritional Science Research Fund has supported more than 80 projects at academic institutions and healthcare facilities.

BYHEALTH is directing its R&D efforts based on the latest scientific trends, Liang says. He is also president of BYHEALTH's institute of nutrition and health. “A consumer-goods company's core competitiveness depends on technological innovation, which also drives the development of the industry,” he says.



▲ The laboratory in BYHEALTH's factory in Zhuhai, China, which is open to the public.

## NEW DIRECTIONS

BYHEALTH's research mainly focuses on exploring the potential for nutritional supplements to have an impact on ageing, the gut microbiome, brain functions, sports-related fitness, and cardiovascular health. This research involves developing novel ingredients, functions and technologies.

To differentiate itself from other nutrition players, the company is developing new, patent-protected ingredients, Liang says. For example, its scientists spent seven years working with researchers from Sichuan University to develop a local probiotic strain in China, Liang says. They developed a probiotic pool, screened the properties of all the bacteria, and tested them for safety and effects in animals. The result is a proprietary lactobacillus strain called LPB27<sup>1</sup>. *In vivo* and *ex vivo* studies suggested that the strain can resist stomach acid and bile salt, and that it can easily colonize in the intestinal tract.

**“TECHNOLOGY BREAKTHROUGH IS KEY TO THE GROWTH OF THE ENTIRE HEALTH INDUSTRY.”**

To be marketed in China, vitamin and dietary supplement products must currently fit into health function measures. But local authorities in China are planning new regulations that allow the assessment of new functions.

Building on its years of research, BYHEALTH hopes to take advantage of this opportunity and register new categories of dietary supplement properties, Liang says. For example, the company is working with the Institute of Chinese Materia Medica

at China Academy of Chinese Medical Sciences to study the effects of water-soluble tomato concentrate on the properties of blood in mice.

The company is striving to explore more aspects of health, including precision nutrition and anti-ageing, both emerging areas of research that are gaining momentum.

## A PERSONAL APPROACH

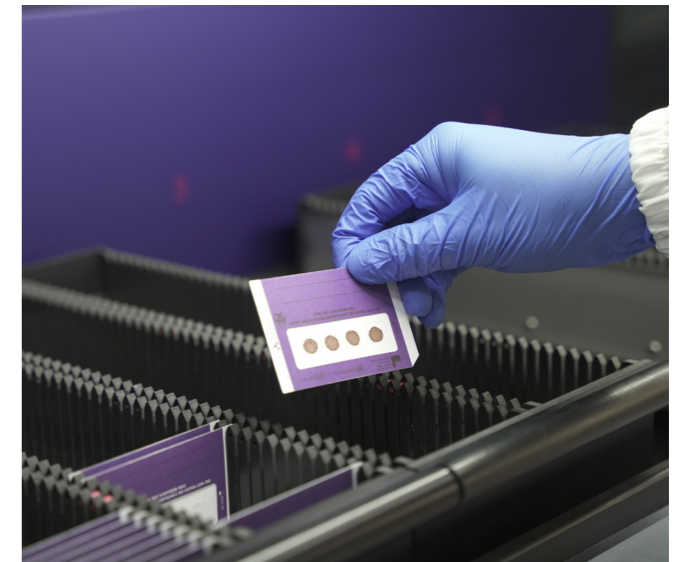
While precision medicine personalizes treatment of diseases, research into precision nutrition requires a comprehensive understanding of a person's unique characteristics, including age, genetics, gut microbiome, lifestyle habits and existing health status.

To further research into the possibilities of precision nutrition, BYHEALTH has designed a system for extracting dry blood spots — a minimally invasive method of collecting a blood sample — to analyse vitamins and minerals in the blood. Based on this system, it is developing an algorithm to potentially customize nutrient supplements. The company is also working with researchers to use the method to explore whether there are any links between vitamin B levels and obesity.

“BYHEALTH hopes to help researchers achieve precision nutrition,” Liang says. “We partner with academics on basic research and work with suppliers of raw materials to translate the findings into possible products.”

## LOOKING TO THE FUTURE

Starting in 2019, BYHEALTH partnered with Chinese Academy of Sciences' Shanghai Institute of Nutrition and Health to study metabolic homeostasis — the stability or resilience of the metabolic system — in people. Their goal is to test whether it's possible



▲ In dry blood spot testing, samples are collected from a finger prick on a filter paper and dried before they are sent for clinical testing.

to quantify metabolic health based on various measurable biometrics. The researchers hope that the findings might serve as a roadmap for evaluating disease risk and guiding nutritional interventions.

Possible nutritional interventions to slow the effects of ageing is another big focus at BYHEALTH. Its scientists participated in a CAS-led study on the role of procyanidin C1 (PCC1), a component of specific grape seed extract, in ageing. In *in vitro* studies of human cells, low concentrations of PCC1 inhibited the formation of biomarkers associated with senescent cells — non-dividing cells linked to ageing<sup>2</sup>. In several mouse models of cancer, PCC1 in combination with chemotherapy significantly reduced tumour burden and extended animal survival. In very old mice, PCC1 cleared senescent cells and extended the median post-treatment lifespan significantly compared with vehicle-treated animals, the researchers found.

Nutritional research is accelerating at BYHEALTH. In 2022, the company's

chairman, Yunchao Liang, laid out a research-based strategy, to see the company rapidly become one of the world's most innovative and technological dietary supplement firms. Under this model the plan is to make forward-looking research breakthroughs on nutrition, while bringing a novel product to the market every two to three years. ■

## REFERENCES

- Liang, H. et al. *Biosci. Biotechnol. Biochem.* **84**, 12, 2558–2568 (2020). <https://doi.org/10.1080/09168451.2020.1811948>
- Xu, Q., Fu, Q., Li, Z. et al. *Nat Metab* **3**, 1706–1726 (2021). <https://doi.org/10.1038/s42255-021-00491-8>

BYHEALTH



汤臣倍健  
营养健康研究院

[www.by-health.com](http://www.by-health.com)  
[www.binh.cn/index0](http://www.binh.cn/index0)