

February 12, 2026 • Dr. Elena Ramirez

NTU Singapore Gut-Based Weight Loss Compound Breakthrough: New Peer- Reviewed Study Published

Revolutionizing Weight Management Through Gut-Targeted
Innovation at NTU

The Innovative Mechanism of NTU's Gut-Based Compound

In a landmark peer-reviewed publication, researchers from Nanyang Technological University (NTU) Singapore have unveiled a novel gut-based compound designed to support weight loss by targeting dietary fat absorption directly in the intestines. This approach marks a departure from traditional weight loss drugs that often suppress appetite or mimic hormones like GLP-1, which can lead to side effects such as nausea or muscle loss. Instead, the NTU compound acts locally within the gut, minimizing systemic impacts while promoting a healthier microbial environment. 89 88

The compound draws inspiration from naturally occurring fatty acid hydroxy fatty acids (FAHFAs), lipids found in the human body and certain foods like white adipose tissue and colostrum. However, natural FAHFAs are present in low concentrations and degrade quickly in the digestive tract. NTU scientists engineered gut-stable versions, ensuring they remain effective during oral administration. This stability allows the compound to interact precisely with intestinal cells and the gut microbiome. 89

At its core, the compound operates through a dual mechanism. First, it blocks specific receptors on enterocytes—the absorptive cells lining the small intestine—reducing the uptake of dietary fats into the bloodstream. This 'controlled brake' on fat absorption prevents excess lipids from overwhelming the liver, a common precursor to metabolic associated steatotic liver disease (MASLD), previously known as non-alcoholic fatty liver disease. Second, it fosters the growth of beneficial gut bacteria that produce short-chain fatty acids (SCFAs) such as acetate, propionate, and butyrate. These SCFAs enhance gut barrier integrity, curb inflammation, and support overall metabolic health by signaling to the brain and other organs via the gut-brain axis. 88

- Receptor blockade on intestinal cells limits fat translocation to portal vein and liver.
- Selective promotion of SCFA-producing microbiota like Bifidobacterium and Lactobacillus species.
- Minimal systemic absorption, staying confined to the gastrointestinal tract for safety.

This targeted action addresses a critical gap in current therapies, offering a complementary tool for individuals managing high-fat diets or limited mobility, without interfering with nutrient absorption like glucose or essential vitamins.

Lead Researchers and NTU's Multidisciplinary Expertise

The study was spearheaded by Associate Professor Andrew Tan, Provost's Chair in Metabolic Disorders and Vice Dean (Innovation and Enterprise) at NTU's Lee Kong Chian School of Medicine (LKC Medicine). Assoc Prof Tan's team collaborated closely with Professor Tan Choon Hong from the School of Chemistry, Chemical Engineering and Biotechnology (CCEB), who spearheaded the chemical synthesis platform to create stable FAHFA analogs. Additional contributors included NTU Senior Research Fellow Dr Cheng Hong Sheng, PhD student Mr Joseph Kim, Research Assistant Ms Chin Sze Yuet, and Research Fellow Dr Xie Hao. 88

Assoc Prof Andrew Tan emphasized the innovation's potential: "Our findings suggest that applying a controlled brake on fat absorption in the gut can help reduce the amount of fat reaching the liver, particularly during periods of high-fat intake or for people who are unable to exercise. Diet control and exercise remain the foundation of metabolic health. The aim is to support healthier handling of dietary fats while enabling proper nutrition." 89

NTU Singapore, consistently ranked among Asia's top universities, exemplifies higher education's role in translational research. Its interdisciplinary ecosystem—spanning medicine, chemistry, and biotech—enables breakthroughs like this. For aspiring academics, NTU offers robust platforms for [research jobs in Singapore](#), fostering careers at the intersection of academia and industry. 89

Rigorous Animal Model Validation and Safety Data

The peer-reviewed paper, titled "A gut-liver lipid flux checkpoint mediates FAHFA protection from MASLD," was published in Pharmacological Research (DOI: [10.1016/j.phrs.2025.108085](https://doi.org/10.1016/j.phrs.2025.108085)) on January 6, 2026. Researchers tested the compound in mouse models fed a high-fat diet, mimicking human obesogenic patterns. Oral administration resulted in significantly less body weight gain and reduced hepatic fat accumulation compared to controls. Intestinal fat uptake was curtailed without impacting glucose homeostasis, a key advantage over broad-spectrum lipase inhibitors like orlistat, which often cause gastrointestinal distress. 88

Safety profiling revealed no toxic effects across laboratory assessments, with the compound exhibiting low bioavailability outside the gut. This gut-localized action mitigates risks associated with systemic drugs, such as cardiovascular concerns seen in some GLP-1 agonists. Dr Yew Kuo Chao, Senior Consultant at Tan Tock Seng Hospital, noted: “The NTU gut-localised mechanism aligns with a safety-focused strategy and supports natural metabolic pathways, which are crucial for long-term metabolic disease therapy.” 89

Singapore's Rising Metabolic Health Challenges

Singapore faces escalating obesity and MASLD rates, underscoring the study's relevance. The National Nutrition Survey 2022 reported average daily fat intake rising from 94g in 2019 to 100g in 2022, driven by Westernized diets and urbanization. Globally, obesity affects over one billion people, while MASLD impacts one in three adults, with up to 80% of cases linked to obesity. In Singapore, projections estimate 40% of adults—about 1.8 million—will have fatty liver by 2030, contributing to two million annual liver-related deaths worldwide. 89

For higher education institutions like NTU, such research positions Singapore as a biomedical hub. Students and faculty contribute to national health goals, with opportunities in [Singapore university jobs](#) blending cutting-edge science and public health.

Industry Collaboration Accelerating Translation

NTU partnered with Aria Bioscience Pte Ltd, a longevity biotech firm, to propel the compound toward human trials. Mr Timothy Chen, Executive Director, stated: “Our focus is on advancing additional studies and clinical trials with NTU, coupled with our expertise in downstream development and commercial translation. This will be critical in determining their potential role as future therapeutic options for metabolic disorders.” Short-term plans include launching as an oral supplement under the Arialab RX brand, backed by NTU’s Innovation and Entrepreneurship initiatives. 88

This academia-industry synergy exemplifies Singapore's higher ed ecosystem, where discoveries transition rapidly to market. Professor Louis Phee, NTU Vice President (Innovation and Entrepreneurship), highlighted: “This collaboration shows how academia and industry can work together to advance Singapore’s position at the forefront of biomedical research, for the public good.” 89

NTU's Broader Contributions to Microbiome and Metabolic Research

 NTU has long championed microbiome research, with centers like the Singapore Centre for Environmental Life Sciences Engineering (SCELSSE) exploring gut-health links to aging, immunity, and metabolism. Prior NTU studies linked gut microbes to muscle preservation in aging and developed coated probiotics for targeted delivery. This FAHFA work builds on that foundation, integrating chemical engineering for scalable production. 89

In Singapore's competitive higher education landscape, NTU's outputs attract global talent. Prospective researchers can leverage [academic career advice](#) and pursue [faculty positions](#) in metabolic sciences.

Stakeholder Perspectives and Real-World Implications

Experts praise the compound's nuance. Unlike aggressive fat-blockers causing malabsorption, it gently modulates uptake while enriching the microbiome—crucial for Singaporeans with diverse diets influenced by Malay, Chinese, Indian, and Peranakan

cuisines. Patients with diabetes or post-bariatric needs could benefit, as it spares glucose pathways.

- Reduces liver fat burden, key for MASLD prevention.
- Supports gut barrier against leaky gut syndrome.
- Potential adjunct to lifestyle interventions amid Singapore's sedentary urban life.

For higher ed, this underscores research's societal impact, inspiring students via platforms like [Rate My Professor](#) to engage with innovators like Assoc Prof Tan.

Future Directions and Opportunities in Singapore Higher Ed

Next steps include human pharmacokinetics trials and randomized controlled studies to quantify weight loss efficacy—potentially 5-10% body weight reduction alongside diet, based on analogous interventions. Long-term, it could evolve into prescription therapies for MASLD. 88

Singapore universities like NTU, NUS, and Duke-NUS lead Asia in biotech. This breakthrough highlights career prospects in [postdoc roles](#) and [research assistant jobs](#), driving Singapore's Smart Nation vision. Explore openings at [university jobs](#) or [higher ed jobs](#) to join the next wave.

In conclusion, NTU's gut-based compound represents a paradigm shift, blending higher education innovation with practical health solutions. As research progresses, it promises safer paths to metabolic wellness, reinforcing Singapore's academic prowess.