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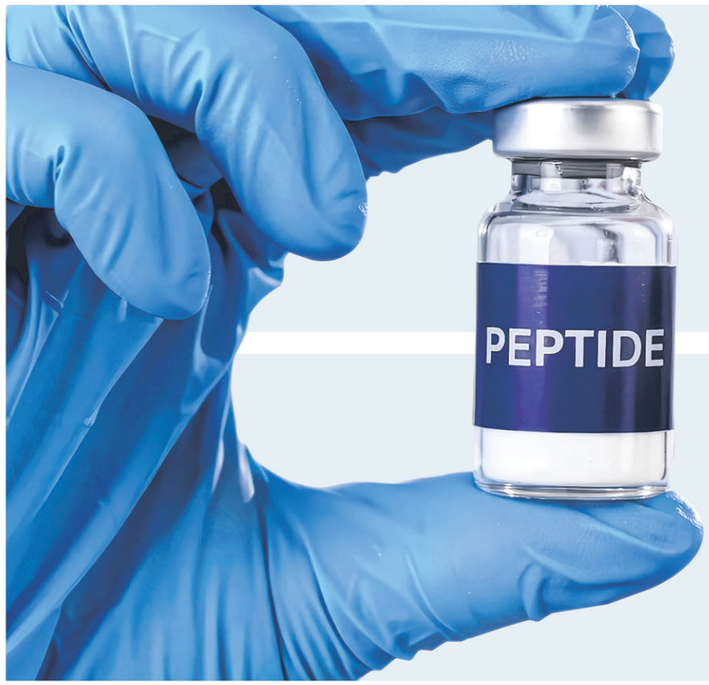


**From a public health perspective, this emerging phenomenon deserves attention because it brings together several challenges at once: widespread self-experimentation, online misinformation, regulatory gaps, questionable manufacturing standards, influencer-driven health claims, and global e-commerce of unproven products.**

**Consumers need to understand the difference between approved peptide medicines and experimental peptides promoted through wellness markets. Public information campaigns should address misleading claims, explain why clinical evidence matters, and highlight the risks of self-administering unverified compounds.**

For many consumers, the term "peptide" is as beguiling as it is confusing. Not only does it seem to promise benefits for almost everything, but it also appears in myriad products. PHOTO: ADOBE STOCK

# *The peptide craze: When hype moves faster than science*

Do consumers really know what they are getting?

**Teo Yik Ying**

What do Silicon Valley executives seeking cognitive enhancement, gymgoers chasing faster muscle gains, longevity enthusiasts hoping to slow ageing, and social media influencers promoting the latest "biohacks" have in common?

The answer is peptides, one of the fastest-growing trends in the global wellness industry.

Across online platforms, and on supermarket shelves and cosmetic counters, peptides are now promoted as tools for almost every aspect of human optimisation, from youthful skin, weight loss and muscle growth to faster recovery from injuries, better sleep, improved memory and even enhanced workplace performance.

For many consumers, the term "peptide" is as beguiling as it is confusing. Not only does it seem to promise benefits for almost everything, but it also appears in a wide range of products. For instance, peptides can be found in collagen powders sold in supermarkets, pharmacies and health food stores, and are marketed as the active ingredient in many skincare serums, creams and gels.

Longevity clinics have incorporated peptides into anti-ageing programmes, fitness communities discuss them as performance enhancers, and direct-to-consumer online vendors market a growing range of peptide products with promises of biological transformation. Social media influencers inject themselves with peptides as they make a pitch for their products' ability to make their skin "glow".

The rapid rise of peptide use has been fuelled by the extraordinary success of a new generation of peptide medicines, commonly known as GLP-1 drugs, that include Wegovy, Ozempic and Mounjaro. These medicines have revolutionised the treatment of obesity and diabetes, producing unprecedented weight-loss outcomes and changing public perceptions of what injectable therapies can achieve.

However, the success of GLP-1 medications has also unintentionally normalised the idea that peptides are a shortcut to better health. Because these drugs are peptide-based therapies, many consumers have begun to assume that other peptides promoted online must similarly be safe and effective.

The reality is very different.

GLP-1 drugs are scientifically validated medicines that have undergone years of research, rigorous clinical trials, careful dose verification and regulatory review. Many peptides now sold directly to consumers are experimental compounds with limited human evidence, uncertain dosing and unknown long-term effects.

From a public health perspective, this emerging phenomenon deserves attention because it brings together several challenges at once: widespread self-experimentation, online misinformation, regulatory gaps, questionable manufacturing standards, influencer-driven health claims, and global e-commerce of unproven products.

The challenge may be even more complex than previous health challenges such as dietary supplements or vaping. This is because peptides are not a single category of products, but a broad family of hundreds of different compounds that can influence different biological processes in the human body.

Some peptides influence hormones, others affect growth, immune responses or brain function. They are now being used for purposes ranging from longevity and beauty to cognition and physical performance.

What is most worrying is that consumer demand for these unapproved experimental products is expanding much faster than scientific understanding and regulatory oversight.

## WHAT EXACTLY ARE PEPTIDES?

Peptides are short chains of amino acids, which are the building blocks of proteins. In simple terms, they act as biological messengers that help cells communicate with one another and regulate different processes in the body.

Many peptides occur naturally in humans and play important roles in regulating hormones, metabolism, appetite, inflammation, immune responses and communication between nerve cells.

Modern medicine has already achieved remarkable successes using peptide-based therapies. Insulin, one of the greatest medical discoveries in history, is a peptide hormone that allows people with diabetes to control blood sugar levels. Oxytocin, another naturally occurring peptide hormone, is widely used in childbirth to induce labour and prevent severe bleeding after delivery.

Many other peptide medicines have transformed treatment for conditions ranging from cancer to hormonal disorders to metabolic diseases.

These medicines are not controversial because they are backed by scientific evidence, manufactured under strict quality standards, and used for clearly defined medical purposes.

The current peptide boom, however, is not centred on these established therapies. Instead, it is being driven by a rapidly expanding market of experimental peptides sold directly to consumers with promises of improved health, delayed ageing and enhanced performance, despite limited or no evidence from high-quality human studies.

For example, anti-ageing peptides such as Epitalon and GHK-Cu are promoted as compounds that may extend lifespan, improve cellular function or stimulate collagen production for younger-looking skin. However, much of the enthusiasm surrounding these products comes from laboratory studies, animal experiments or small preliminary studies, rather than strong clinical evidence demonstrating meaningful benefits in humans.

Other peptides, such as Ipamorelin, are marketed for their ability to stimulate growth hormone release and are popular among fitness communities seeking greater muscle growth and faster recovery. Similarly, Semax and Selank are promoted online as cognitive enhancers that may improve memory, focus or mental performance.

The issue is not that these peptides can be dismissed outright. Some may eventually prove useful in medicine. After all, scientific discovery often begins with experimental compounds.

The problem is that many of these products are moving from laboratories into widespread consumer use before the evidence has caught up.

When a peptide has only limited human studies, or when evidence comes mainly from animal models, important questions remain unanswered. What is the appropriate dose? How long can it safely be used? Who may be at risk of harm? How does it interact with other medicines? Could there be effects that emerge only after years of use?

For many consumer peptides, these questions remain unresolved.

## REASONS FOR CONCERN

The first concern is safety.

Peptides can have powerful effects because they are designed to influence how the body

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# *Healthcare professionals need greater awareness of peptide use*

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functions. This also means they may produce unintended consequences.

A peptide intended to affect growth, metabolism or inflammation may influence other processes in the body. Potential risks could include disruption of hormone systems, cardiovascular effects, fertility-related problems, autoimmune reactions, changes in mood or behaviour, or even effects on pathways linked to cancer.

Without large clinical trials and long-term monitoring, the full risks of widespread consumer use remain unclear.

A second concern is product quality.

Unlike approved medicines, many experimental peptides sold online operate in a regulatory grey zone. They may be marketed as research chemicals, wellness products, supplements or cosmetic ingredients, allowing them to reach consumers through channels that were never designed to ensure pharmaceutical-grade quality.

Concerns about manufacturing standards are not theoretical. The scientific journal Nature reported investigations into independently tested peptide products that found problems with purity and dose accuracy. Some products contained incorrect amounts of the stated compound, impurities or contaminants that could trigger serious immune reactions.

For consumers, this creates a troubling situation: they may believe they are purchasing an advanced biotechnology product, while in reality, they may have little assurance about what is actually inside the vial.

A third concern is the impact on healthcare systems.

As more people use experimental peptides, doctors are likely to see more patients experience complications from these products. Countries such as Australia have reported growing numbers of hospital admissions that are linked to unapproved peptide use, including cases of liver injury and severe allergic reactions.

Another challenge is that many people may not mention their peptide use during medical consultations, simply because they do not think of these products as medicines. As a result, doctors may miss important clues about the causes of symptoms, or overlook potentially harmful interactions with prescribed medications.

A fourth challenge is regulation.

Governments face difficulties because peptides do not fit neatly into existing categories. The same product may be marketed as a cosmetic ingredient, supplement, research chemical or medicine, each of which may fall under different regulatory frameworks.

In Singapore, health supplements do not require pre-market approval, evaluation or licensing from the Health Sciences Authority before they can be imported, distributed or sold. Instead, the system relies heavily on post-market surveillance, with responsibility for product safety and quality placed on dealers.

This model works well for products that pose relatively little risk. It becomes much more challenging when products capable of affecting how the body functions are sold directly to consumers without the same oversight applied to medicines.

Finally, the peptide boom reflects a broader change in how people approach health.

Increasingly, some people are turning to social media influencers, online communities and personal testimonials for health advice. At the same time, the rise of "biohacking" has normalised the idea that the body can be continually optimised through self-experimentation.

For one person, trying a peptide may seem like a personal decision. But when large numbers of people begin experimenting with unapproved biological compounds, it becomes a public health issue.

The concern is the gradual shift away from evidence-based medicine towards consumer-led biological experimentation.

## WHAT CAN BE DONE

The first priority is strengthening regulatory oversight of experimental peptides.

This includes making it easier for doctors and hospitals to report suspected side effects, while giving health authorities stronger laboratory capabilities to test peptide products. Such testing can determine whether products contain what they claim, whether doses are accurate, and whether harmful contaminants are present.

This cannot be achieved by regulators alone. Public health agencies, hospitals, universities, laboratories and Customs authorities all have important roles to play in identifying unsafe products and preventing them from reaching consumers. Since many peptides are purchased online from overseas sellers, international cooperation will also be essential.

Second, healthcare professionals need greater awareness of peptide use.

Doctors, nurses and pharmacists should routinely ask patients about peptide use when taking medication histories, just as they ask about supplement and traditional medicines. Without this information, clinicians may miss important causes of adverse reactions or treatment complications.

Third, public education is essential. Consumers need to understand the difference between approved peptide medicines and experimental peptides promoted through wellness markets. Public information campaigns should address misleading claims, explain why clinical evidence matters, and highlight the risks of self-administering unverified compounds.

Such efforts should reach communities where peptide use is increasingly common, including gyms, fitness networks, longevity communities and online platforms. This will require collaboration between public health authorities, healthcare professionals and social media companies to promote accurate health information and reduce the spread of misleading claims that may cause harm.

## ACTING BEFORE HARM OCCURS

Peptide therapeutics represent one of the most exciting frontiers in modern medicine. They have already transformed treatment for major diseases and will likely deliver many more breakthroughs in the future.

Thus, the concern is not peptides themselves, but the rapid, unregulated spread of experimental peptides into routine consumer use before their safety and effectiveness are established.

This emerging challenge sits at the intersection of biotechnology, regulation, digital misinformation, clinical practice and global commerce. It is unlikely to disappear because the forces driving it, including advances in biotechnology, social media influence, longevity culture, e-commerce and the desire for self-directed health optimisation, are only getting stronger.

The goal should not be to slow innovation, but to ensure innovation is guided by evidence.

History has shown that when consumer markets move faster than science, society often pays the price later. With the right safeguards, peptides can transform lives without becoming the next public health regret.

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