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CURVES HOLDINGS Co., Ltd.
Curves Japan Co., Ltd.

For Immediate Release

Results of Joint Research by the Institute of Development, Aging and Cancer at Tohoku University and Curves Japan Co., Ltd.

Suggest that approximately four months of circuit training improves immune function and enhances blood flow throughout the body

~A time when it's easy to get sick due to the lingering summer heat and temperature fluctuations— maintain your health from the inside out~

Changes in blood proteins involved in immune and inflammatory regulation, angiogenesis, and tissue repair
Improvements in cognitive functions (executive functions and memory) were also observed

Curves Japan Co., Ltd. (Headquarters: Minato-ku, Tokyo; Representative Director and Chairman: Takeshi Masumoto), which operates 2,014 clubs of "30-minute Women-only Wellness Fitness Club Curves" nationwide and supports the health and wellness of 900,000 members—mainly in their 40s to 70s—has conducted joint research with the Smart-Aging Center at the Institute of Development, Aging and Cancer, Tohoku University (a research group led by Professor Yasuyuki Taki) to scientifically verify the effects of habitual circuit training[*2] (at least twice a week, 30 minutes per session) over approximately four months using a randomized controlled trial (RCT)[*1] involving healthy middle-aged and older women.

As a result, circuit training conducted over approximately four months not only significantly improved cognitive function but also, following a comprehensive analysis of approximately 1,000 types of proteins in the blood using cutting-edge technology, revealed significant changes in proteins related to "immune and inflammatory regulation" (the body's defense against viruses and bacteria), "angiogenesis" (the formation of new blood vessels), and "tissue repair" (the process of aiding the body's recovery), suggesting the potential for enhanced immune function and improved systemic blood flow.

Due to concerns about the impact of recent record-breaking heat waves on health—including heatstroke—managing health during the summer has become a major challenge [1]. Particularly among middle-aged and older adults, the body's regulatory functions (such as temperature regulation and autonomic nervous system activity) and vascular flexibility tend to decline with age, making daily health management even more important.

The "improvement of immune function and systemic blood flow-improving effects" suggested by this study are expected to help maintain health during the summer, when people are prone to feeling unwell due to temperature fluctuations caused by heat and air conditioning.

In addition, improvements in cognitive function (executive function and memory), which had been confirmed in previous joint research (2014 and 2020), were again observed in this study. "Executive function" refers to the brain's higher-order functions that regulate thought and behavior in relation to set goals. "Memory function" is a brain function necessary for maintaining a healthy lifestyle, but it is also a function that declines with age in cases of mild cognitive impairment and dementia.

Since Curves' circuit training involves moderate exercise intensity (about 70% of maximum heart rate), it is easy for middle-aged and older adults to participate in, and even those who are not in the habit of exercising can join in without hesitation. The findings of this study were published in the scientific journal *Frontiers in Sports and Active Living* (published online on June 23, 2026).

[Research Background]

In Japan, which has entered a super-aged society, extending healthy life expectancy is a critically important social issue. There is a gap between lifespan and "healthy lifespan (the period during which a person can live without restrictions on daily life)," and for women, that gap is approximately 12 years [2]. Changes associated with aging extend beyond cognitive function to affect systemic functions such as the immune system, blood vessels, and tissue repair; maintaining and improving these functions determines how long a person can live independently.

It is widely known that regular exercise helps maintain and improve health [3]. Curves has also conducted extensive joint research with universities and specialized research institutions to verify the various health benefits of exercise, including the prevention of lifestyle-related diseases, nursing care prevention, and improvement in cognitive function.

On the other hand, there have been very few comprehensive analyses of blood proteins based on intervention studies in humans to determine what changes occur in the body as a result of exercise and how these changes contribute to overall health. Therefore, in this study, we conducted a comprehensive analysis of approximately 1,000 types of proteins in the blood (which serve as indicators of overall health) before and after approximately four months of circuit training, with the aim of elucidating the biological mechanisms by which circuit training affects overall health.

<Supplementary explanation of research terms>

*1 Randomized controlled trials are a research method used in the medical field that provides high-quality evidence (high level of evidence).

*2 Circuit training is a fitness program that alternates between 30 seconds of "strength training" and 30 seconds of "aerobic exercise."

< Source >

[1] Ministry of the Environment, "Heatstroke Environmental Health Manual"

[2] Ministry of Health, Labour and Welfare, "Health Japan 21 Action Support System (Healthy Life Expectancy)"

[3] Ministry of Health, Labour and Welfare, "Physical Activity and Exercise Guide for Health Promotion 2023"

[4] Curves Japan Co., Ltd., "Evidence" (Information for medical institutions)

[Health benefits suggested by the findings of this study]

Analysis conducted as part of joint research with the Smart-Aging Center at the Institute of Development, Aging and Cancer, Tohoku University revealed the following significant changes in blood proteins—which are believed to play a key role in maintaining health—and brain function among participants who regularly engaged in circuit training.

1. The body's defense against viruses and bacteria (changes related to immunity and inflammation control)

Significant changes induced by exercise were observed in proteins (such as "LRRC25," "IL10RA," and "CD7") that are believed to help suppress inflammation in the body and play a role in the activity of immune cells. These results suggest that this may help support, from within, the maintenance and enhancement of the immune system's ability to protect the body against viruses and bacteria.

2. The process of forming new blood vessels (changes related to angiogenesis)

Changes were observed in proteins (such as "PROK1") associated with angiogenesis—the process of forming new blood vessels to increase the number of pathways for delivering nutrients and oxygen to tissues. These results suggest that this approach may support improved systemic blood flow and circulation, as well as the development of a supple body that defies the effects of aging, at the blood level.

3. The process of aiding the body's recovery (changes related to tissue repair)

Changes were observed in proteins (such as "TNFRSF12A") associated with the repair of damaged cells and tissues (tissue repair). These results suggest that these effects may contribute to the body's resilience and support recovery from fatigue.

4. Improvement in brain function (cognitive function)

Building on previous joint research, continued circuit training has once again been shown to improve cognitive functions (executive function and memory function) in the brain. In daily life, its benefits can be expected in situations such as the following.

- You are expected to remain focused on the household chores, hobbies, and daily tasks at hand without letting background noise or random distractions throw you off your stride, and to carry out your work efficiently and effectively.
  (Inhibitory function: A brain function that allows attention to be directed accurately without being distracted by irrelevant information)
- It is expected that this will help you accurately distinguish and remember daily events, appointments, and experiences in your mind, making it easier to recall them when needed.
  (Memory function: The brain's ability to correctly distinguish and recall learned information)

[Researcher Comment]

Professor Yasuyuki Taki, Smart-Aging Center, Institute of Development, Aging and Cancer, Tohoku University

The study sought to understand, at the blood level, how regular circuit training affects the entire body by comprehensively analyzing approximately 1,000 types of blood proteins before and after a circuit training intervention. While the previous two studies reported that circuit training may help maintain and improve cognitive function, this study demonstrated changes in blood proteins associated with overall health—including immune and inflammatory regulation, angiogenesis, and tissue repair—in addition to cognitive function. These findings are believed to provide important clues for understanding the mechanisms by which circuit training supports health in the body.

Currently, Japan is facing serious fiscal pressures due to rising medical and nursing care expenses, and it has become an urgent priority—particularly for local governments—to implement measures aimed at extending healthy life expectancy and promoting health. Given the contemporary societal challenge of how to extend healthy life expectancy, this research is believed to be highly significant in that it demonstrates how making a habit of engaging in simple, 30-minute exercise sessions can help maintain and improve health at the blood level.

Going forward, we plan to further expand the study population and the duration of the research, and hope to continue building a body of scientific evidence demonstrating how circuit training contributes to brain and physical health.

[Research Overview]

◆ Participants: 48 healthy women aged 41 to 74 with no history of mental or neurological disorders

◆ Measured items:
- Cognitive function tests (comparative analysis before and after intervention)
- Comprehensive analysis of approximately 1,000 types of proteins in the blood using state-of-the-art proteomics technology

◆ Study design: Randomized controlled trial (RCT)

Intervention details (intervention group):	Circuit training sessions of 30 minutes each, at least twice a week, for approximately 4 months (Number of participants included in the analysis: 23 for cognitive function tests / 22 for blood tests)
Control group details:	Maintain normal daily activities (Number of participants included in the analysis: 25 for cognitive function tests / 22 for blood tests)

◆ Circuit training details:

A 30-minute exercise program that combines strength training, aerobic exercise, and stretching. The program is designed to provide a well-balanced full-body workout by alternating every 30 seconds between strength training using a hydraulic machine and aerobic exercise performed on a step board.

Figure 1 Circuit Training



[Research Result]

- In the circuit training intervention group, which lasted approximately four months, improvements were observed in two specific aspects of cognitive function: executive function (inhibitory control—the brain's ability to focus attention without being distracted by interfering information) and memory function (the brain's ability to correctly distinguish and recall learned information).
- Changes were observed in blood proteins related to immune and inflammatory regulation (functions involved in suppressing inflammation and regulating the activity of immune cells), angiogenesis (the formation of new blood vessels to facilitate the delivery of oxygen and nutrients to tissues), and tissue repair (the repair of damaged cells and tissues).

Summary of Results
Not only did approximately 4 months of regular circuit training significantly improve cognitive function, but a comprehensive analysis of approximately 1,000 types of proteins in the blood using cutting-edge technology revealed significant changes in proteins related to "immune and inflammatory regulation" (the body's defense against viruses and bacteria), "angiogenesis" (the formation of new blood vessels), and "tissue repair" (the process of aiding the body's recovery). These findings suggest the potential for enhanced immune function and improved systemic blood flow.

Detailed results of blood protein analysis

In an analysis comparing changes between the circuit training intervention group and the control group, proteins such as LRRC25, IL10RA, PROK1, CD7, and TNFRSF12A were identified as candidates that characterize the response to exercise. LRRC25 and IL10RA are believed to be proteins associated with anti-inflammation and immunosuppression; PROK1 and TNFRSF12A are believed to be proteins associated with angiogenesis and tissue repair; and CD7 is believed to be a protein associated with the activation of immune cells. These significant changes in blood protein levels suggest the potential for improved immune function and enhanced systemic blood flow, indicating that circuit training may be beneficial as an exercise routine for maintaining a healthy body as we age.

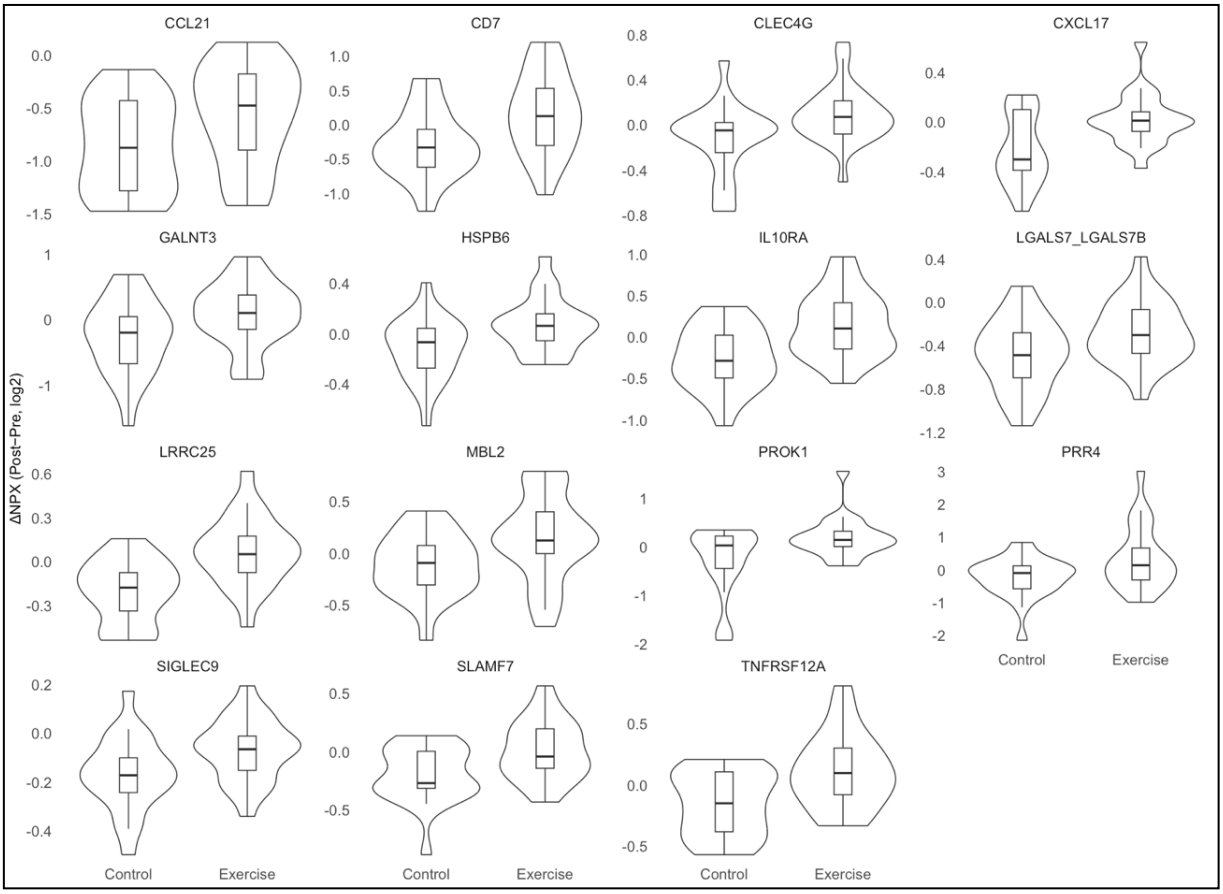

Figure 2: Comparison of changes in protein expression between the circuit training group and the control group (Excerpted from Soga, ..., & Taki et al. (2026), Frontiers in Sports and Active Living)

[About Smart-Aging Center, Institute of Development, Aging and Cancer, Tohoku University]

In developed countries, including Japan, there are concerns that economic losses due to dementia will increase as the elderly population continues to grow. In addition, the youth population is declining in developing countries as well, and these nations are set to face an aging society in the near future. Therefore, addressing dementia is a critical global issue, and its prevention, in particular, is an urgent priority. In particular, Japan has the most advanced aging population among developed nations, and it is estimated that there are currently more than 8 million people with dementia or at risk of developing it. Furthermore, the economic losses attributable to dementia are currently estimated to total approximately 14.4 trillion yen annually, comprising about 1.9 trillion yen in medical expenses, about 6.4 trillion yen in nursing care expenses, and about 6.1 trillion yen in “informal care costs”—the monetary value of care provided free of charge by family members and others. Given the magnitude of these economic losses, there is currently an extremely high social need for dementia prevention measures. Therefore, in order for individuals and society to maintain their vitality even in a super-aged society, it is essential that “each person continue to grow as a human being and become wiser while remaining healthy as they age, and that society as a whole evolve into a wiser and more sustainable structure” (Smart Aging); research must be promoted to achieve

this. In light of these current conditions, the Smart-Aging Center collaborates with researchers both in Japan and abroad. As an interdisciplinary research hub dedicated to mobilizing the university's full resources to realize smart aging, the Center brings together researchers from diverse fields—including medicine, engineering, economics, and the humanities—to conduct a wide range of research activities and industry-academia collaboration initiatives.
In addition, the Taki Laboratory—which serves as the backbone of the Smart-Aging Center—began in 2012 with five clinicians. Since then, it has seen the integration of the Department of Geriatrics, the establishment of Smart-Aging Research Center, participation in large-scale international collaborative research projects (including HORIZON 2020), and the acceleration of industry-academia collaboration, the size of the laboratory has grown tenfold over the past decade. Currently, the laboratory has published 392 original research papers (in English), comprises 62 research members, and collaborates with 26 companies; these numbers are expected to continue to grow (Source: the official website of the Taki Laboratory, Institute of Development, Aging and Cancer, Tohoku University: https://argm.idac.tohoku.ac.jp/english).

[About Curves Japan Co., Ltd.]
Curves Japan Co., Ltd. is a core operating company of Curves Holdings Co., Ltd. (listed on the Tokyo Stock Exchange Prime Market), established in February 2005 with the mission of addressing various social issues arising in a super-aged society by spreading the habits of correct exercises. Curves Japan operates 2,014 clubs of "30-minute Women-only Wellness Fitness Club Curves" nationwide (as of July 31, 2026) and supports the health and wellness of 900,000 members (as of June 30, 2026), mainly in their 40s to 70s.
Curves' exercise program is a circuit training program that combines the three exercises necessary for good health: strength training, aerobic exercise, and stretching, and provides a full-body workout in 30 minutes per session. Using a proprietary hydraulic machine, the intensity can be easily adjusted to suit each individual's physical and muscular strength, allowing for safe and effective exercise. In addition, instructors provide exercise guidance and support tailored to each individual, to facilitate continued exercise and enable them to achieve results without difficulty.

[Company profile]

■ Curves Japan Co., Ltd. (core operating company of CURVES HOLDINGS Co., Ltd.)

Representative:	Takeshi Masumoto, Representative Director and Chairman
Location:	11F Shibaura Renesite Tower, 3-9-1 Shibaura, Minato-ku, Tokyo
Established:	February 2005
Capital:	100 million yen (FY 8/2025)
Business overview:	Operation of exercise facilities such as "30-minute Women-only Wellness Fitness Club Curves" and "30-minute No-Reservation Assisted Gym Men's Curves"
Website:	https://www.curves.co.jp/

■ CURVES HOLDINGS Co., Ltd.

Company name:	CURVES HOLDINGS Co., Ltd. (Securities code: 7085, Prime Market of the Tokyo Stock Exchange)
Representative:	Takeshi Masumoto, Representative Director, President and Group CEO
Location:	11F Shibaura Renesite Tower, 3-9-1 Shibaura, Minato-ku, Tokyo
Established:	October 2008
Capital:	800 million yen (FY 8/2025)
Website:	https://www.curvesholdings.co.jp/en/index.html