



Precision
Biotics®



Clinical
Evidence
Summary

Immune health.
Lactobacillus
paracasei,
L. CASEI 431®

Scientific information. For healthcare professionals only.

CLINICAL EVIDENCE SUMMARY

Immune health. *Lactobacillus paracasei*, L. CASEI 431®

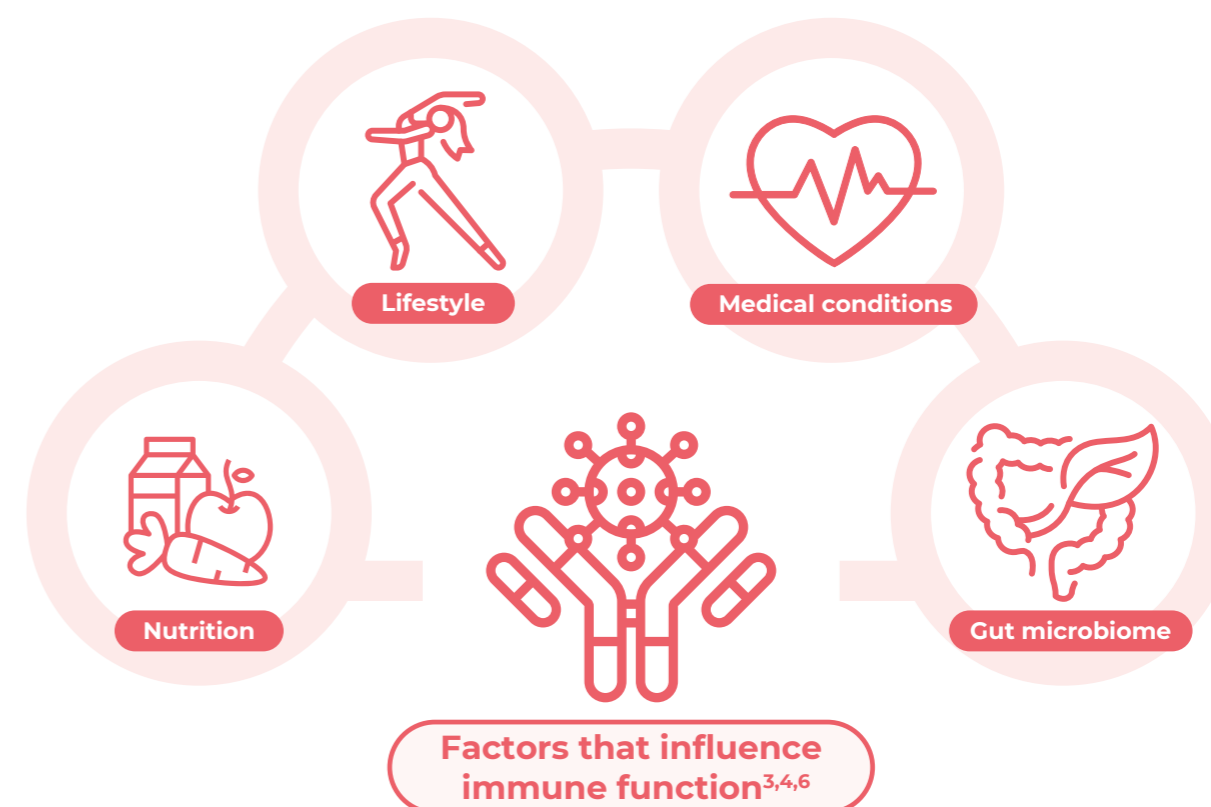
Key Points

- ▶ The immune system is vital for overall well-being, acting as the body's primary defence against infections and harmful agents¹.
- ▶ Common cold and flu viruses affect 3 to 5 million people globally each year, presenting a significant burden to healthcare systems².
- ▶ Nutrition, lifestyle and the gut microbiome have all been demonstrated to play important roles in supporting immune function³⁻⁵.
- ▶ Specific strains of probiotics have been associated with maintenance of immune health via their influence upon the gut microbiome^{3,4,6}.
- ▶ *Lactobacillus paracasei* 431 (L. CASEI 431®) may positively influence immune health through modification of the immune response⁷⁻¹⁰, reducing respiratory symptoms⁷, increasing antibody levels⁸⁻¹⁰, and beneficially modulating cytokine production¹¹.
- ▶ Certain strains of probiotics may help the immune response to seasonal vaccines, such as the flu vaccine⁶.

Immune health

Immune health is critical to overall wellbeing, as the immune system is the body's primary defence against infections and disease. Comprising a complex network of cells, tissues, and organs, the immune system identifies and neutralises pathogens (including bacteria and viruses) and toxins¹.

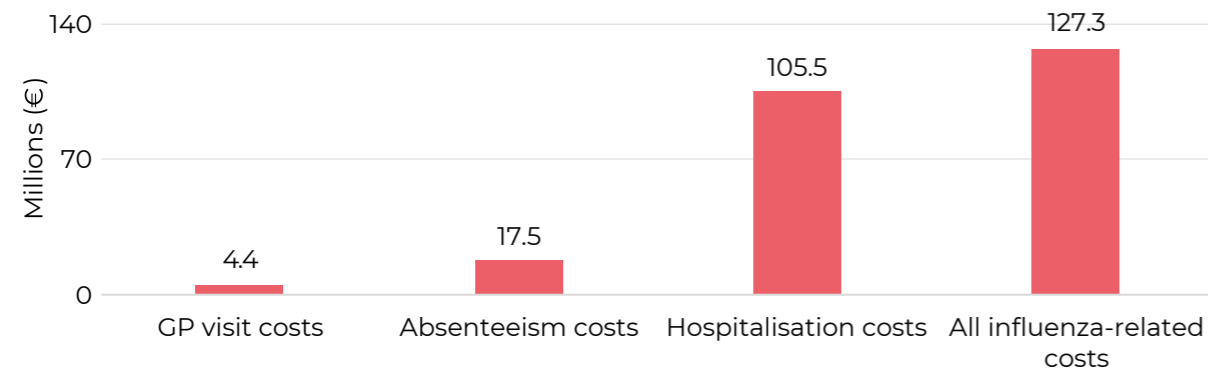
In recent years, there has been growing interest in understanding the factors that support immune function, including nutrition, lifestyle and underlying factors that affect immune function³⁻⁵. In particular, the role of the gut microbiome in modulating immune health has gathered significant attention, highlighting the potential of probiotics in supporting immune function⁶.



Challenges to the immune health

One of the most significant challenges to the immune system is posed by common cold and flu viruses. According to the World Health Organization, 3 to 5 million people globally suffer from symptoms such as runny nose, chills, fatigue, sore throat, and muscle aches each year, leading to considerable discomfort and disruption to daily life².

These flu-like illnesses impose a substantial burden on society and healthcare systems. In the European Union, seasonal influenza costs are estimated between €6 billion and €14 billion annually¹². In the UK, the total number of influenza cases between 2021-2022 exceeded 64,000 and accounted for over 72,000 visits to the general practitioner (GP). The associated costs are represented below.



Adapted from de Fougerolles, 2024¹³




Flu-like illnesses challenge the immune system, often resulting in high levels of absenteeism from work or school and significant productivity losses².

Probiotics and the immune system

Given that almost 70-80% of the body's immune cells are located in the gastrointestinal tract, maintaining gut health is crucial for supporting immune function¹⁴. There is evidence that certain probiotic strains may help to support immune health, through their specific interactions in the gut¹⁵.

Lactobacillus paracasei, **L. CASEI 431**[®] is a probiotic strain that has been shown to support immune health. There is evidence from human trials that this strain may beneficially modulate the immune system and may help to reduce the duration and severity of respiratory infections⁷⁻¹⁰.

Studies have demonstrated that **L. CASEI 431**[®] may:

-  Modulate the immune response⁷⁻¹⁰
-  Help reduce duration of respiratory discomforts⁷
-  Increase the number of antibodies produced in response to an immune challenge⁸⁻¹⁰
-  Beneficially modulate cytokine production¹¹

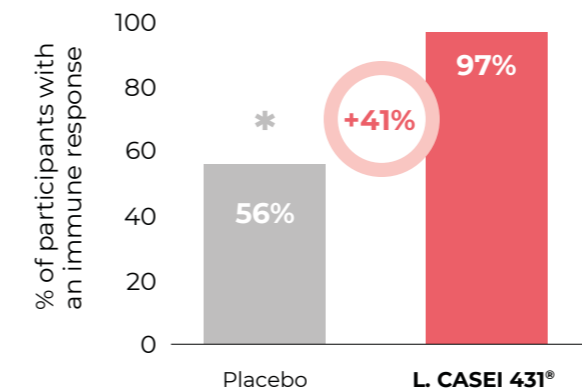
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Clinical Evidence

Improvement of immune response after an immune challenge

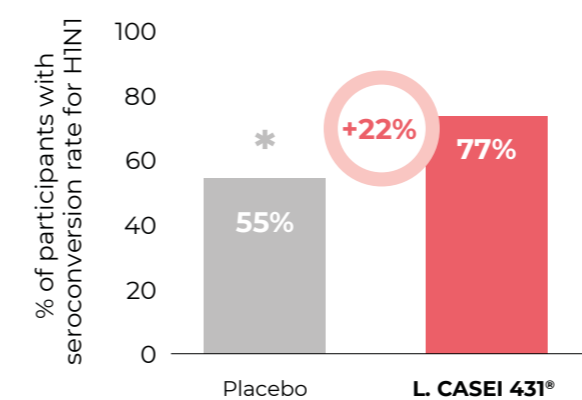
A randomised, triple-blind, placebo-controlled trial examined the effects of daily consumption of fermented probiotic milk containing 1×10^9 colony forming units (CFU) of *Lactobacillus paracasei*, **L. CASEI 431**[®] on the immune response to vaccination for the influenza viruses H1N1, H3N2 and Flu-B. Healthy adults (18-45 years of age) received either the fermented probiotic milk or a placebo for six-weeks, with the vaccination administered two weeks later. The study assessed, among other parameters, the seroconversion after vaccination and the percentage of participants with an immune response¹⁰.

Population	Sample size	Probiotic	Comparator	Duration
Healthy adults 18-45 years of age	n= 30 placebo n= 30 probiotic	1×10^9 CFU of L. CASEI 431 [®]	Placebo (acidified milk)	6 weeks

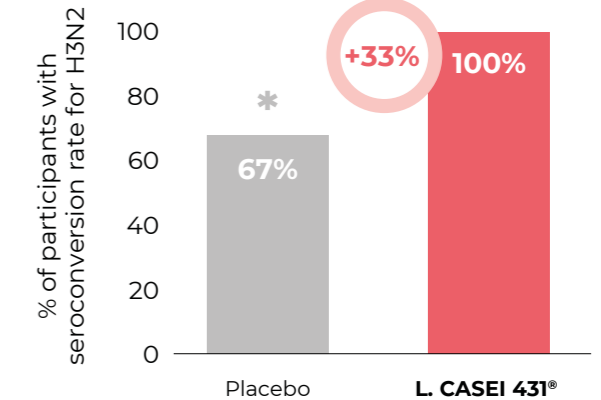


* p < 0.01 between intervention and placebo

The intervention with **L. CASEI 431**[®] led to a significant increase in the percentage of participants showing an immune response after vaccination compared to the placebo group (p<0.01), resulting in a 41% improvement in immune response.



* p < 0.05 between intervention and placebo



* p < 0.0001 between intervention and placebo

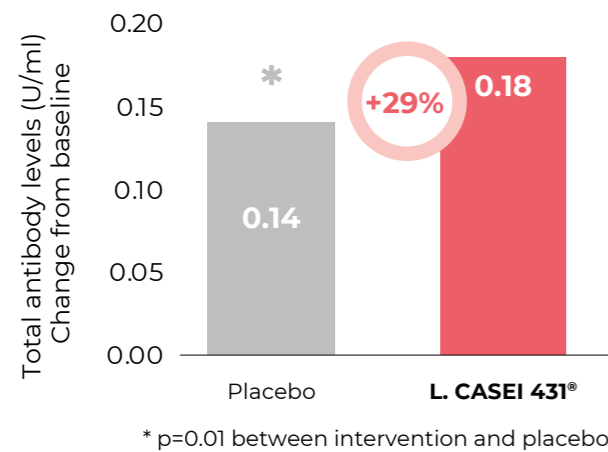
Additionally, the **L. CASEI 431**[®] intervention significantly increased the seroconversion rates for both H1N1 (p<0.05) and H3N2 (p<0.0001), with improvements of 22% and 33%, respectively.

Clinical Evidence

Improvement of antibody production to an immune challenge

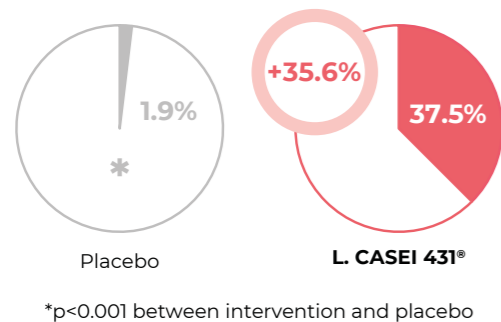
A randomised, double-blind, placebo-controlled study assessed the immune benefits of *Lactobacillus paracasei*, **L. CASEI 431**[®] in an influenza vaccination model. Healthy adults (mean age 33.2 years) consumed a probiotic dairy drink containing 1×10^9 CFU of **L. CASEI 431**[®] or placebo, once daily for six weeks. After two weeks, a seasonal influenza vaccination was given. Plasma and saliva samples were collected at baseline and after six weeks for the analysis of antibodies, cytokines and innate immune parameters⁹.

Population	Sample size	Probiotic	Comparator	Duration
Healthy adults Mean age: 33.2 years	n= 54 placebo n= 56 probiotic	1×10^9 CFU of L. CASEI 431 [®]	Placebo drink	6 weeks

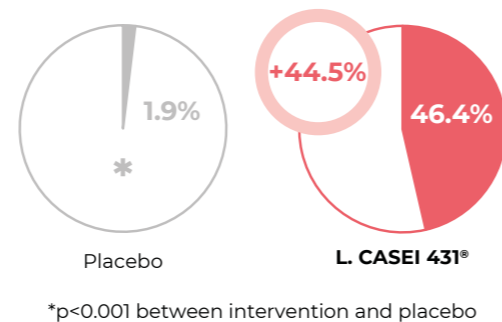


The intervention **L. CASEI 431**[®] drink significantly increased total antibody levels in response to the flu vaccination, as measured by the change from baseline (p=0.01), leading to a 29% improvement in immune response in the probiotic drink group compared to the placebo drink.

Vaccine-specific IgG1
(% of participants with a substantial increase)



Vaccine-specific IgG3
(% of participants with a substantial increase)



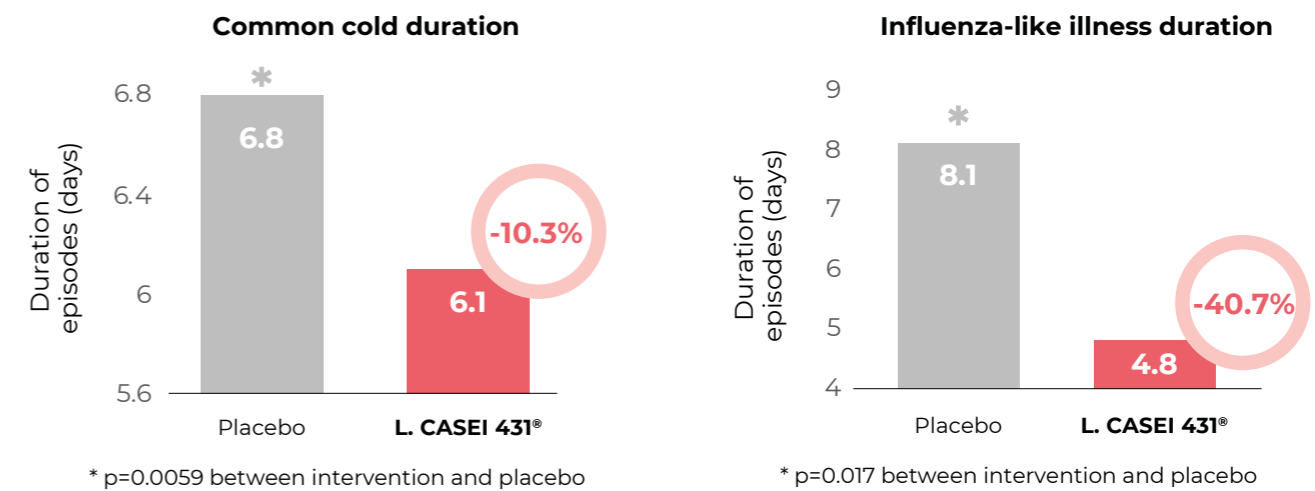
Furthermore, the **L. CASEI 431**[®] drink significantly increased the percentage of participants with a substantial increase of the vaccine-specific IgG1 and IgG3 levels (p<0.001).

Clinical Evidence

Reduction of the duration of upper respiratory tract discomfort

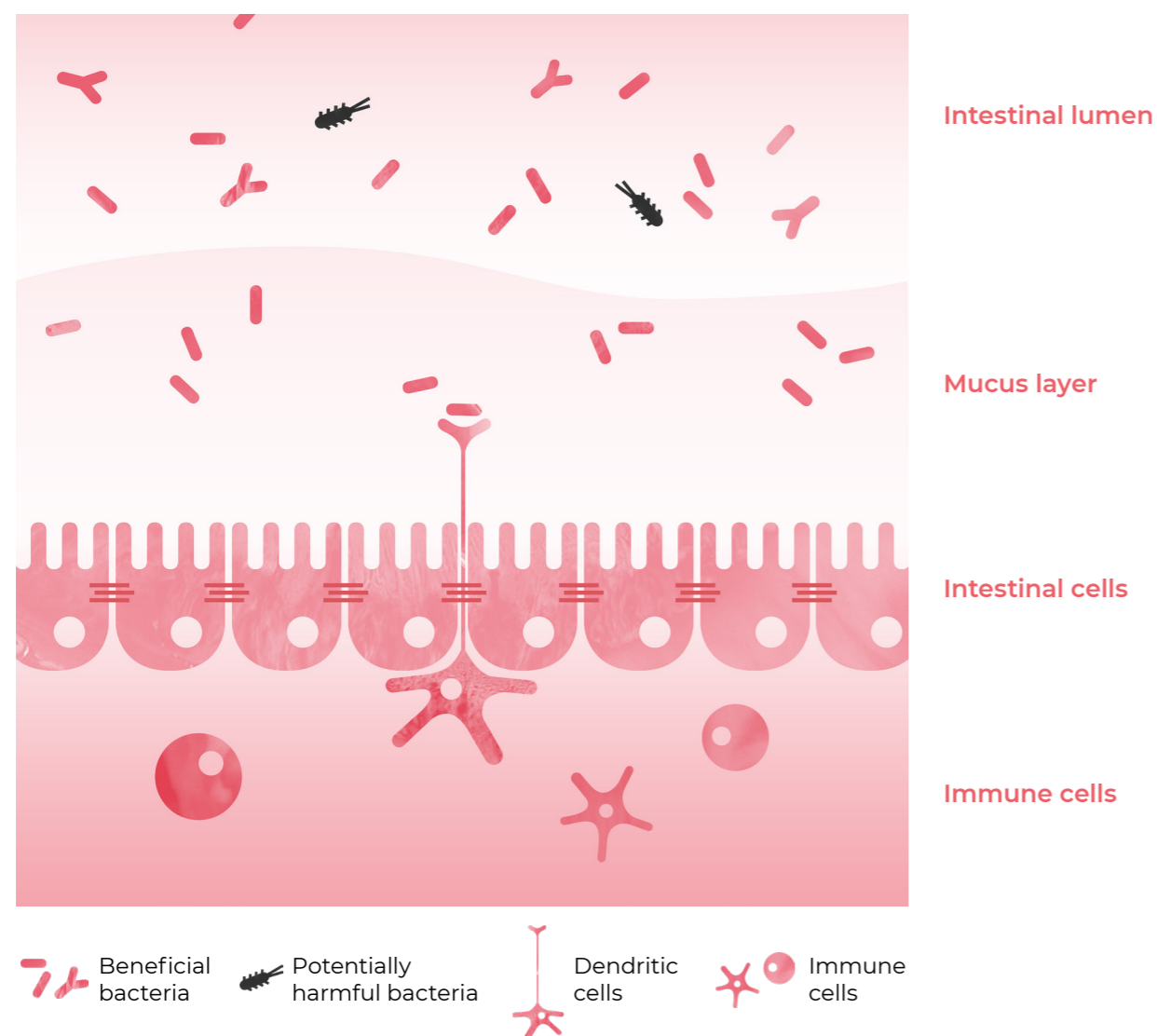
A randomised, triple-blind, placebo-controlled, parallel-group study evaluated the effect of daily consumption of an acidified milk drink containing $\geq 1 \times 10^9$ CFU of *Lactobacillus paracasei*, **L. CASEI 431**[®] on immune response to influenza vaccination and respiratory symptoms. Healthy adults (18-60 years of age) were given a probiotic milk or placebo over a six-week period, and the vaccination was administered three weeks thereafter. The study assessed the immune response to the vaccine, the number of influenza-like illness cases and the duration of upper respiratory symptoms⁷.

Population	Sample size	Probiotic	Comparator	Duration
Healthy adults 18-60 years of age	n= 551 placebo n= 553 probiotic	$\geq 1 \times 10^9$ CFU of L. CASEI 431 [®] drink	Placebo drink (acidified milk)	6 weeks



Although no probiotic effect on the immune response to vaccination was observed, the daily intervention with **L. CASEI 431**[®] significantly reduced the duration of common cold episodes by 10.3% (p=0.0059) compared to the placebo drink group. Similarly, the **L. CASEI 431**[®] group experienced a 40.7% reduction in the duration of influenza-like illness episodes, translating to a three-day reduction of the episode duration (p=0.017).

Proposed mode of action of *Lactobacillus paracasei*, L. CASEI 431®



Specific strains of oral probiotics may modulate the immune response and increase antibody titres against infections by increasing production of virus- or bacteria-neutralising antibodies⁹.

Lactobacillus paracasei, L. CASEI 431® is believed to support immune health by:



1. Modulating the immune response⁷⁻¹⁰
2. Increasing the number of antibodies⁹⁻¹⁰
3. Modulating cytokine production¹¹
4. Activating immune cells^{*7-10}

* Approximately 70-80% of human immune cells are located around the intestine¹⁴, highlighting the critical role of maintaining intestinal barrier integrity and a balanced gut microbiome in supporting immune function¹⁵. L. CASEI 431® may support immune function by its interactions within the gut.

Summary

- The immune system is essential for overall well-being, acting as the body's primary defence against infections and harmful agents¹.
- Common cold and flu viruses significantly challenge the immune system, affecting 3 to 5 million people globally each year, causing major discomfort and disrupting daily life².
- Nutrition, lifestyle, and the gut microbiome are important factors in supporting immune function. Emerging evidence suggests that specific probiotic strains may play a role in maintaining immune health^{3,4,6}.
- *Lactobacillus paracasei*, L. CASEI 431® is a probiotic strain that supports immune health by:
 - Modulating the immune response⁷⁻¹⁰
 - Reducing the duration of common cold and flu-like illness⁷
 - Increasing antibody levels in response to a challenge⁸⁻¹⁰
 - Beneficially modulating cytokine production¹¹
- Incorporating certain strains of probiotics as a standard management approach may help the immune response to seasonal vaccines.

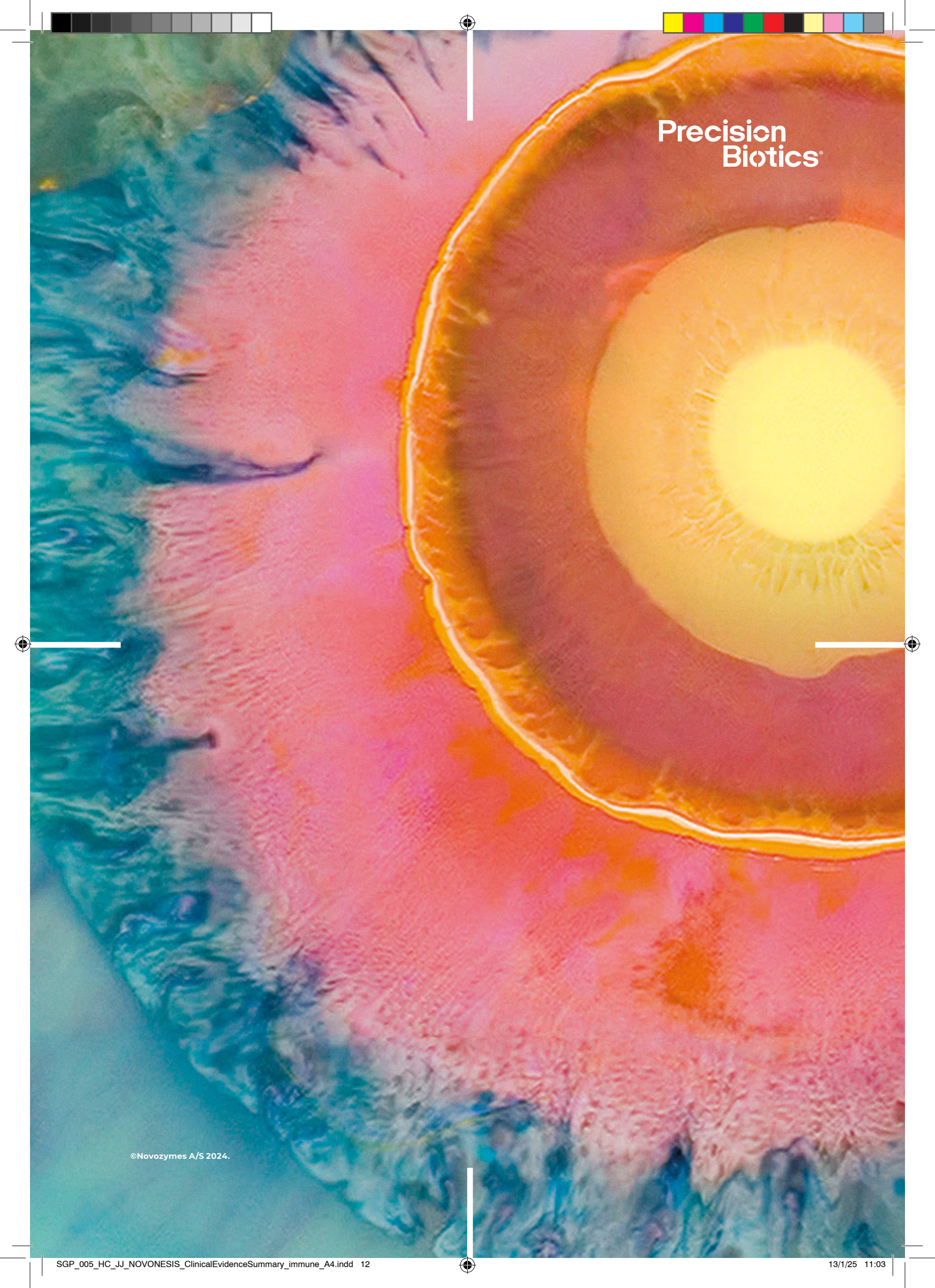
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Learn more about how
***Lactobacillus paracasei*, L. CASEI 431®**
could help manage immune health
by visiting our CPD Learning Hub at

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