

Probiotics+ Immunity

The widest range of benefits



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Microbiologists Dr. Nigel Plummer and Dr. Sue Plummer established Cultech Ltd in 1994 with the vision for a company with research at its heart.



Immune Health and Related Conditions

The immune system is responsible for defending the body against foreign invaders and helping to prevent or minimise illness and disease.

The immune system comprises two subsystems that are closely related and work together to help protect us from illness. They are known as the innate (non-specific) immune system, which is with us from birth, and the adaptive (specific) immune system, also known as acquired immunity as it is initiated at birth and 'learned' throughout our life.

The gastrointestinal tract (GIT) and gut microbiome are closely related to the immune system, as 70-80% of our immune cells are found in the gut, making it the main site of interaction between our immune system and both endogenous and exogenous microorganisms, and the development and function of the immune system depend on these interactions.

The GIT is a single layer of cells, which presents a dynamic structure to recognise commensal bacteria and to limit pathogens form entering the body. The evidence suggests that the commensal bacteria exert an anti-inflammatory and immune influence, providing essential nutrients, metabolising indigestible compounds, defending against pathogens and supporting the intestinal architecture.

The Role of Probiotics in Immunity

Immune cells and commensal microbes in the human intestine constantly communicate with one another to help maintain healthy immune activities. The gut microbiota plays a crucial role in modulating the immune system, with effects that occur both locally in the mucosal layer of the GIT, and systemically, e.g. through the gut-lung axis. The microbiota is essential for the development, maturation, and overall health of the immune system during the first 1,000 days of life. This period represents a critical window of opportunity for probiotic intervention.

As probiotics are proxies for the most beneficial members of our microbiome, they can potentially interact and stimulate intestinal immune cells and commensal microbes to modulate immune function throughout life.

4 published randomised placebo-controlled clinical studies and an immune-response study showing benefits for immunity for adults, children and babies

2 studies showing Lab4 Probiotics benefits for URTIs in children

Large study with 454 mother-baby pairs showing the impact of Lab4B Probiotics on the development of allergy in babies

Large study with 220 adults showing the benefits of Lab4P Probiotics for URTIs in adults

Supported by an immune-response study investigating chronic inflammation in adults



Studies

The Evidence for Lab4 Effectiveness for Immune Health

The Lab4 family of probiotics has shown consistent and significant reduction of various immune-mediated symptoms in babies (Lab4B), children (Lab4) and adults (Lab4 and Lab4P).

Babies and Lab4B

The Swansea Baby Study >

This randomised, double-blind, placebo-controlled study was designed in conjunction with the College of Medicine at Swansea University, to evaluate whether Lab4B Probiotics given during infancy could prevent allergy in children.



- The babies given the Lab4B Probiotics were 56% less likely to develop atopic eczema by 2 years of age than those given a placebo (*P<0.05).
- The babies given Lab4B Probiotics were 44% less likely to develop allergic reaction to common allergens, including grass pollen, cow's milk, hen's egg, house dust mite and cat dander (*P<0.05).



The primary author from Swansea University, Prof. Stephen Allen, concluded that 'Lactobacilli and Bifidobacteria administered to pregnant women and infants aged 0-6 months prevented atopic sensitisation and atopic eczema'.



Scan for more info

Children and Lab4

Two randomised, double-blind placebo-controlled studies have been undertaken confirming the beneficial effects of Lab4 Probiotics with low dose vitamin C on the prevention of upper respiratory tract infection symptoms and absenteeism from school in children.

To our knowledge, this is the first time two probiotic studies (ProChild and ProChild-2) with the same intervention for the same duration, have shown beneficial effects in the management of upper respiratory tract infections (URTIs) in children attending school.

The ProChild Study >

This randomised, double-blind, placebo-controlled pilot study investigated the efficacy of Lab4 Probiotics with low dose vitamin C in significantly reducing the symptoms of coughs and colds in young children attending pre-school facilities, who are the most susceptible age group.



Conclusion

compared to those taking placebo (*P<0.05)

Lab4 Probiotics in combination with low dose vitamin C significantly reduced the incidence of coughs and colds in pre-school age children.





coughs and colds in the children taking Lab4 Probiotics and vitamin C compared to those taking placebo (*P<0.05).





The ProChild-2 Study

This second randomised, double-blind, placebo-controlled study investigated the effect of Lab4 Probiotics with low dose vitamin C in the prevention of upper respiratory tract infections in children attending school, aged 3-10 years.



-50% Sore throat Cough

- A 16% significant reduction in the incidence of coughing was observed in the children taking Lab4 Probiotics and low dose vitamin C compared to those taking placebo (*P<0.05).
- There was a 20% significant reduction in the incidence of sore throats in the children taking Lab4 Probiotics and vitamin C versus those taking placebo (*P<0.05)



• A 79% significant reduction was observed in the incidence of all five URTI symptoms in one day in the Lab4 Probiotics group compared to the placebo group (*P<0.05).

Adults and Lab4/Lab4P

Our immune-related research has also involved ex vivo work and identification of immune responses as secondary measures in other studies undertaken with adults.

The Adult Immune Study (Lab4) >

The primary focus of this study was to assess whether or not 12 weeks of daily Lab4 Probiotics and FOS prebiotic supplementation had the potential to reduce a chronic inflammatory state by suppressing the expression of the pro-inflammatory mediators, by measuring secretion of IL-6 and IL-1 β via peripheral blood mononuclear cells in response to 72 hours' incubation with a bacterial toxin.





• There was significant enhancement in the production of antiinflammatory cytokines IL-10 and TGF- β over the 12-week period in the presence of the Lab4 Probiotics.

Conclusion

The consumption of Lab4 Probiotics in combination with FOS alters ex vivo cytokine production demonstrating potential immunomodulatory benefits in healthy adults.



-40%

Lab4 Probiotics in combination with low dose vitamin C reduced the incidence of coughing and sore throats, and also reduced the incidence of days with five URTI symptoms.







Peripheral blood mononuclear



• Supplementation with Lab4/FOS dampened pro-inflammatory cytokine secretion.

• There was a significant decrease in the production of proinflammatory cytokines IL-6 and IL-1β.











- There was a significant reduction in all of the following URTI symptoms:
- Coughing (*P=0.007)
- Sneezing (*P<0.0001)
- Blocked nose (*P=0.018)
- Headache (**P*<0.0001) - Earache (*P=0.017)
- Muscle ache (*P=0.023)

The Promagen Study (Lab4P)

Lab4P

0.5

0.0

Placebo

This randomised, double-blind, placebo-controlled study investigated the effect of 6 months' supplementation with Lab4P Probiotics on body weight, plasma cholesterol and wellbeing in healthy overweight and obese individuals, including assessing the impact of Lab4P Probiotics on upper respiratory tract infection (URTI) symptoms.



- taking placebo (*P<0.0001).
- The URTI symptoms included cough, sneezing, runny nose, blocked nose and sore throat.



Conclusion

Supplementation of overweight and obese adults with Lab4P Probiotics resulted in a significant reduction in the incidence of URTI symptoms and headaches and significant improvement in reported Quality of Life scores.

- The Quality of Life assessment questionnaire covered five areas general wellness, state of health, state of energy, state of mood and sleep quality.
- There was a significant improvement in general wellness scores at 3 months (6.3%, *P<0.01) and at 6 months (5.6%, *P<0.05) in the group supplemented with Lab4P Probiotics compared to the placebo group.
- Significant improvements were also observed at 3 months in scores for state of health (5.8%, *P<0.05), state of energy (5.5%, *P<0.05), and state of mood (5.1%, *P<0.05) in those taking the Lab4P Probiotics compared to those taking placebo.





Viral Pandemic Link >

Further analysis of the results of the Lab4P Promagen Study was undertaken to investigate the impact of Lab4P Probiotics on the occurrence of URTI symptoms in overweight and obese people, and the implications this might have during viral pandemics. The results were published in a stand-alone paper.





There was a significant reduction in specific URTI symptoms (cough, sore throat, headache, muscle pain and wheeze) in the group taking the Lab4P Probiotics compared to the placebo group (#P<0.0001).
The impact of the Lab4P Probiotics supplementation on the incidence of URTI symptoms was greater in participants aged 45 years and older (40% reduction) or with a BMI >=30 (43% reduction).



• After 1-2 weeks supplementation in both those aged 45+ and those with a BMI >=30, there was a divergence in the time taken to record the first symptom, with the placebo group recording symptoms far earlier than those taking the Lab4P Probiotics.

BMI 30 and over

• The delays in symptom onset were maintained over the duration of the study and suggest a rapid impact of Lab4P Probiotics on URTI symptoms, particularly in the more 'at risk' groups.



Proposed Mechanism of Action of Probiotics for Enhancing Immune Response to URTI >>

The beneficial immune effects of Lab4 Probiotics are well-reported and this study aimed to identify the regulatory roles of these probiotics on the innate immune system using cultured macrophages.



Conclusion

Supplementation of overweight and obese adults with Lab4P Probiotics for 6 months resulted in a significant reduction in the incidence of specific URTI symptoms, with the greatest benefits seen in those over 45 years of age and those with a BMI >30.







Lab4 Probiotics induce production of antiviral IL-12 in human macrophages, priming them for viral challenge and helping to promote a strong antiviral immune response.









A multitude of benefits

- Lab4 Probiotics has shown simultaneous benefits on digestive health, immune function, athletic performance, gut-brain axis, and alongside antibiotic use
- Lab4B Probiotics has been shown to be safe during pregnancy and for newborn infants and to have specific immune benefits for babies
- Lab4P Probiotics has shown benefits in relation to metabolic health, as well as entraining all the benefits identified for the original Lab4 consortium
- The Lab4 consortia are adapted to the human gut with demonstrable ability to survive stomach acidity and bile acids and to colonise epithelial tissue and mucous
- Shelf-life up to 24 months in ambient conditions*

Why Lab4 Probiotics Work

One body system

The gut and hence the microbiome are extensively connected to almost all of the other physiological systems of the body, this includes the immune system, endocrine system, brain and central nervous system, and metabolic physiology.

Proxies for microbes

Consequently, as proxies for our microbiome, effective probiotics could also impact beneficially on these distant physiologies - and these benefits may be manifest simultaneously as the intestinal health benefits outlined above.

Bacterial colonisation

Lab4 contains Lactobacillus acidophilus (two strains) as well as Bifidobacterium animalis subsp. lactis and Bifidobacterium bifidum. The Lactobacilli are dominant colonisers of the sparsely populated small intestine and the Bifidobacteria constitute a significant population in the distal small intestine and are also present throughout the large intestine.

High dose

Over the past 30 years it has become evident that higher doses of effective probiotic strains produce faster, greater and more consistent effects and benefits. In all clinical studies on adults performed to date, Lab4 has been supplemented at 25 billion a day. This is why we have seen a broad range of consistent health benefits across a wide range of conditions and particularly with intestinal health.

*In powder and capsule products produced and packed appropriately

See our other Guides >





Lab4 Probiotics blends are available as freeze-dried concentrated powders at various concentrations. Please contact us for more details at info@lab4probiotics.co.uk or on 01639 825100 www.lab4probiotics.co.uk

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