

Global Prebiotic Association Young Researcher Awards - Entry #344

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Please indicate which category you're applying for:

GPA Young Researcher Award for Applied Research (115 points possible)

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 [Parker-et-al-2023_Effects-of-24-week-prebiotic-intervention-on-self-reported-upper-respiratory-symptoms-gastro.pdf](#)

Please provide a link to your published paper (if open access) or abstract:

<https://www.tandfonline.com/doi/full/10.1080/17461391.2023.2216657>

Please provide a summary of your research(limit 250 words)

Elite rugby union players are exposed to numerous stressors including high training demand, frequent competitive matches, limited recovery time and regular international travel. Collectively, these stressors may increase the risk of upper respiratory and gastrointestinal illness. Indeed, rugby union players have been reported to experience four upper respiratory infections per season, with most occurring during pre-season and the winter period. This is accompanied by a reduction in the primary salivary antibody immunoglobulin A (sIgA). Therefore, interventions that can help reduce the burden of these clinical presentations in elite athletes are needed.

The profile, genetic material, and functional activity of the gut microbiome has a substantial influence of systemic immunity. Dietary interventions that target the gut microbiome may be a suitable strategy to support athlete health. Previously probiotics have provided equivocal results with some studies showing improvements in upper respiratory and gastrointestinal symptoms in runners and rugby union players.

Prebiotics are substrates that are selectively utilised by host microorganisms, conferring numerous health benefits to the host. Bimuno-galactooligosaccharide (B-GOS) is a galactooligosaccharide derived from the action of β -galactosidase and has been shown to elicit immunomodulatory effects. Previously, galactooligosaccharides were shown to reduce URS incidence and GIS severity in a student cohort, but to date there is no evidence of their efficacy in elite athletes.

Therefore, the aim of this research study was to investigate the effects of a 168-day B-GOS supplementation on upper respiratory and gastrointestinal symptoms and sIgA in elite rugby union players during a competitive season.

Please provide a summary of methods (limit 250 words)

Thirty-three elite rugby union players were randomly assigned to consume a prebiotic (2.8 g/day galactooligosaccharide) or placebo (2.8 g/day maltodextrin), daily for 168 days during the regular rugby union season in the Gallagher Premiership, under double-blind conditions. Participants completed daily and weekly questionnaires for self-reported upper respiratory (URS) and gastrointestinal symptoms (GIS) respectively. Blood and saliva samples were collected at 0, 84, and 168 days for assessment of plasma TNF- α and CRP, and saliva IgA respectively.

Please provide a summary of your results (limit 250 words)

During the 168 days of supplementation the duration of a URS episode was shorter in the B-GOS group (7.4 ± 2.8 days) compared to the placebo group (9.8 ± 4.1 days) ($P = 0.045$). Similarly, the area under the curve (AUC) for total (all symptoms assessed) and upper (all symptoms associated with the upper GI tract) GIS was lower in B-GOS compared to placebo (Total; $P = 0.030$, Upper; $P < 0.001$). This was accompanied with a greater number of symptom free weeks for GIS in the B-GOS group (11 ± 4 weeks) compared to placebo (7 ± 5 weeks) ($P = 0.041$). Suggesting that B-GOS had a positive effect on both the incidence and severity of GIS. There was a trial x time interaction for sIgA secretion rate ($P = 0.001$), with a higher secretion rate at day 168 in B-GOS (129.23 ± 38.15 $\mu\text{g}/\text{min}$) than Placebo (90.06 ± 33.45 $\mu\text{g}/\text{min}$) ($P = 0.004$). There were no differences in URS incidence rate between B-GOS (1.0 ± 1.4) and Placebo (1.0 ± 1.0) ($P = 0.641$), and no between group differences in plasma TNF- α and CRP ($P > 0.05$).

Please provide a statement about what, in your opinion, makes this paper outstanding and why it fits into the grant category you selected. (limit 250 words)

To our knowledge, this is the first ever study that has assessed the effects of a dietary prebiotic supplement on acute illness in a unique cohort of elite level athletes. Acute illness is a huge burden in elite sport, as the second most common reason (behind musculoskeletal injuries) for an athlete to seek medical help. Such disruptions can limit training and competition availability significantly impacting performance. We have shown that the daily

supplementation of B-GOS can reduce the duration of an URS episode, meaning an athlete can return to full training or competition sooner, increasing training load and/or player availability. Additionally, the improvement in GIS also means that athletes will have fewer and less severe discomfort, meaning they can perform at their optimum more regularly. The fact that these significant findings were found in the field during a professional rugby union season in the English topflight provides novel direct application of prebiotics in a real-world setting. It is also important to note that many elite athletes from different sports face similar stressors to that of elite rugby. Strikingly, 50% of medical consultations at the Olympic Games and during international football tournaments are due to an acute illness. The impact of this is evident as athletes with fewer absences are more likely to succeed in competition. This highlights the importance of athlete availability and the fact that we showed a reduction in the duration of illness shows the impact it could have in the wider sporting community.

By typing your full name below and completing this application, you verify that you are the first author of this research and that this paper is original research.

Connor Parker

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