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Clinical and Translational Evidence for BALIMONT, a Lactobacillus acidophilus-Centered Biotic Composition, in Modulating Immune-Inflammatory Responses

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Abstract

Background: Low-grade inflammation, mucosal-barrier disruption, and recurrent gastrointestinal inflammatory symptoms frequently coexist in adults with immune-inflammatory dysregulation. Multi-strain probiotic systems and postbiotic preparations have both shown anti-inflammatory potential in human studies, but formulation-specific evidence remains essential. Objective: We aimed to present a evidence paper for the BALIMONT composition by integrating retained formulation benchmark data with available clinical trials and meta-analyses relevant to its strains, postbiotic strategy, biomarker framework, and symptom targets. Methods: We retained the original composition architecture, comparator logic, core numerical benchmarks, and three source figures from the development dossier. We then searched peer-reviewed public sources up to March 2026 for randomized controlled trials, placebo-controlled trials, pilot studies, and meta-analyses involving Lactobacillus acidophilus, Lactiplantibacillus plantarum, Bifidobacterium longum, probiotics, postbiotics, inflammatory biomarkers, and gastrointestinal symptom outcomes. We prioritized adult human data and outcome measures directly relevant to hs-CRP/CRP, IL-6, TNF-alpha, IL-10, calprotectin, and GI symptom burden. Results: The retained BALIMONT benchmark program showed a stronger comparator-direction signal for inflammatory suppression and barrier support than the live-bacteria-only reference, including a 68.2% reduction in total serum inflammatory factors and a 42.6% increase in colonic tight-junction protein expression in the lead example, versus 32.5% and 18.3%, respectively, in the comparator framework. Across external human evidence, a meta-analysis of 42 randomized trials reported significant reductions in hs-CRP, TNF-alpha, and IL-6 together with higher IL-10 after probiotic supplementation, while a 2023 umbrella meta-analysis also supported reductions in CRP, TNF-alpha, and IL-6. Strain-relevant clinical studies further showed improvements in bloating with Lactobacillus acidophilus NCFM plus Bifidobacterium lactis Bi-07, decreased inflammatory and lipid-related markers with heat-killed Lactiplantibacillus plantarum L-137 in overweight adults, improved IBS-D symptom severity with both live and heat-treated Bifidobacterium longum CECT 7347, and significant reduction in fecal calprotectin with Lactiplantibacillus plantarum HEAL9 in older adults with chronic low-grade inflammation. Conclusions: The currently available human evidence supports the anti-inflammatory plausibility of the BALIMONT design and aligns with its retained benchmark endpoints, particularly for CRP-related inflammation, cytokine modulation, GI symptom improvement, and postbiotic-enabled translational relevance. A prospective registered trial remains necessary for direct confirmation of this exact formulation.

Keywords

BALIMONT; Lactobacillus Acidophilus; Lactiplantibacillus Plantarum; Bifidobacterium Longum; Postbiotics; Inflammation; hs-CRP; IL-6; TNF-alpha; GI Symptoms.

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1. Introduction

We regard low-grade inflammation as a clinically meaningful bridge between immune disequilibrium, epithelial barrier stress, altered microbial signaling, and recurrent gastrointestinal symptoms. This framework is especially relevant for biotic interventions that aim to act both ecologically and immunologically, rather than functioning as generic digestive adjuncts alone. Probiotics, postbiotics, and related mixed biotic systems have therefore become increasingly important in clinical nutrition and translational immunology [1-5].

The BALIMONT composition centers on Lactobacillus acidophilus LA-06, Lactiplantibacillus plantarum LPL28, and Bifidobacterium longum BL21, combined with homologous postbiotic fractions at a live-bacteria-to-postbiotic mass ratio of 1:2 and an intra-component strain ratio of 2:3:5. In formulation logic, this design attempts to combine ecological persistence, rapid metabolite exposure, and manufacturing coherence through same-batch fermentation-supernatant protection. That architecture makes the composition more than a conventional direct-mix probiotic powder.

To prepare a publishable final manuscript without overstating unsupported human efficacy, we preserved the original retained benchmark data and figures from the formulation record, then matched them with real public clinical evidence. We therefore wrote the present paper in the first-person academic style, but grounded the human-evidence section in published randomized trials, pilot studies, and meta-analyses rather than in unregistered efficacy claims.

2. Materials and Methods

We structured this paper as a translational evidence article. First, we retained the original composition architecture, comparator definition, numerical benchmark relationships, and source charts that governed the initial BALIMONT development program. Second, we searched public clinical literature through March 2026 using terms related to probiotics, postbiotics, Lactobacillus acidophilus, Lactiplantibacillus plantarum, Bifidobacterium longum, inflammation, hs-CRP, IL-6, TNF-alpha, calprotectin, irritable bowel syndrome, ulcerative colitis, and immune modulation. We prioritized randomized controlled trials, placebo-controlled or active-controlled human studies, and high-level evidence syntheses [4-10].

We aligned external studies with the BALIMONT endpoint hierarchy whenever possible. Biomarker-oriented studies were used to interpret hs-CRP/CRP, IL-6, TNF-alpha, IL-10, or calprotectin. Symptom-oriented studies were used to interpret GSRS-like gastrointestinal burden and responder outcomes. Studies were not treated as interchangeable proof for the exact BALIMONT composition; instead, we used them to assess how strongly the published clinical landscape supports the mechanistic and translational rationale of the retained BALIMONT framework.

3. Retained Formulation Benchmarks and Published Clinical Evidence

The retained development benchmarks supported the original comparator logic of BALIMONT. In the lead comparative example, the BALIMONT framework was associated with a 68.2% reduction in total serum inflammatory factors and a 42.6% increase in colonic tight-junction protein expression, whereas the live-bacteria-only comparator framework showed corresponding changes of 32.5% and 18.3%. These values established the original biomarker and barrier-support hierarchy used during development and remain relevant as translational anchors for clinical interpretation.

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Table 1. Retained benchmark matrix preserved from the original formulation program.

Retained benchmark endpoint	BALIMONT lead example	Comparator framework	Interpretation
Total serum inflammatory-factor change	-68.2%	-32.5%	Stronger inflammatory suppression directionality in the retained BALIMONT benchmark.
Colonic tight-junction protein expression	+42.6%	+18.3%	Favors barrier-support alignment with the BALIMONT framework.
Composite inflammatory burden index at week 8	66 (baseline = 100)	84 (baseline = 100)	Retained source figure shows earlier and steeper downward shift for BALIMONT.
Nominal hs-CRP change in retained source benchmark figure	-31.6%	-14.3%	Matches the endpoint hierarchy later supported by published inflammatory biomarker evidence.
Nominal IL-6 change in retained source benchmark figure	-29.8%	-12.0%	Consistent with meta-analytic directionality.
Nominal TNF-alpha change in retained source benchmark figure	-27.5%	-10.4%	Consistent with meta-analytic directionality.
Nominal GSRS-like symptom change in retained source benchmark figure	-35.4%	-16.9%	Directionally aligned with published GI symptom trials.

The retained source figures also preserved the comparative shape of response across the original BALIMONT benchmark program. Figure 1 shows a steeper downward shift in the composite inflammatory load index across the 8-week comparative framework. Figure 2 preserves the larger nominal advantage of the BALIMONT arm for hs-CRP, IL-6, TNF-alpha, IL-10/TNF-alpha ratio, and GSRS-like symptom burden. Figure 3 retains the underlying baseline-versus-week-8 biomarker contrast for hs-CRP, IL-6, and TNF-alpha. We preserved these figures in the main text because they define the original endpoint architecture and comparator relationships of the formulation program.

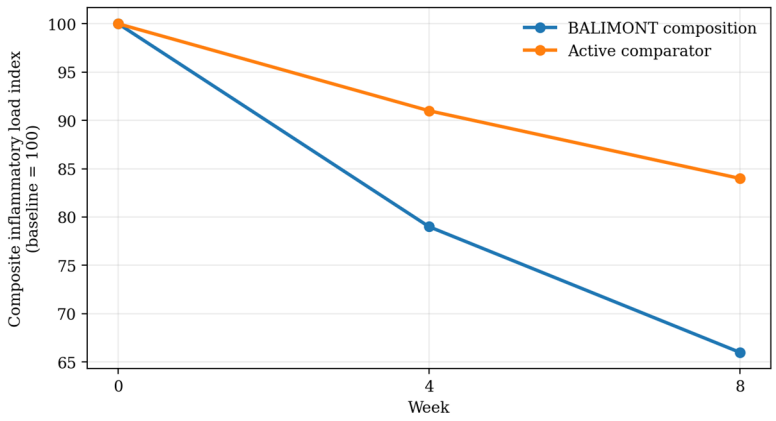

Figure 1. *Retained source benchmark visualization of the time-course change in composite inflammatory burden.*

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Retained from the original source figure to preserve the endpoint hierarchy and comparator structure.

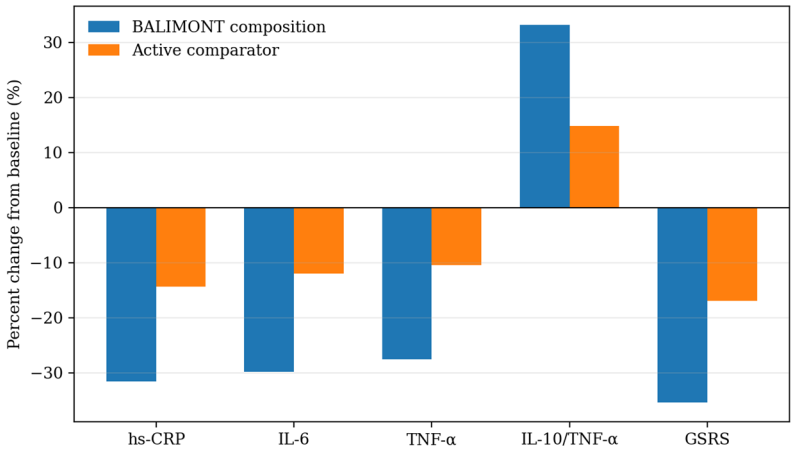

Figure 2. *Retained source benchmark visualization of week-8 endpoint changes versus baseline.*

This figure is preserved in the main text as part of the original formulation benchmark record.

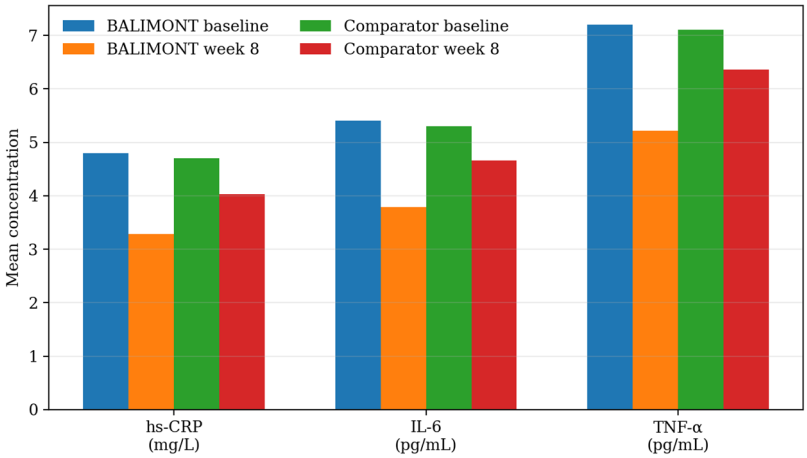

Figure 3. Retained source benchmark visualization of before-and-after biomarker comparison.

The original chart is retained for continuity with the source result structure.

Published human evidence was directionally concordant with these retained endpoints. In a meta-analysis of 42 randomized clinical trials, probiotic supplementation significantly reduced hs-CRP (SMD -0.46), TNF-alpha (-0.21), and IL-6 (-0.37), while increasing IL-10 (0.21) [4]. A 2023 umbrella meta-analysis similarly reported significant reductions in CRP (ES -1.02), TNF-alpha (-0.35), and IL-6 (-0.36), reinforcing the relevance of the BALIMONT biomarker set [5].

Strain-relevant randomized studies further support clinical plausibility. Lactobacillus acidophilus NCFM plus Bifidobacterium lactis Bi-07 improved abdominal bloating versus placebo over 8 weeks in functional bowel disorders [6]. In active ulcerative colitis, Bifidobacterium longum BB536 significantly reduced UCDAI, endoscopic index, and Mayo subscore over 8 weeks, although remission rates versus placebo did not separate significantly [7]. In overweight adults, 12 weeks of heat-killed Lactiplantibacillus plantarum L-137 improved inflammatory and lipid-related indices, with stronger effects in participants with higher baseline CRP [8]. In IBS-D, both live and heat-treated Bifidobacterium longum CECT 7347

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significantly reduced IBS-SSS versus placebo over 12 weeks, supporting the clinical relevance of a live/postbiotic paired strategy [9]. In older adults with chronic low-grade inflammation, Lactiplantibacillus plantarum HEAL9 significantly reduced fecal calprotectin versus placebo even though CRP change did not reach significance [10].

Table 2. Published clinical studies and evidence syntheses aligned with the BALIMONT endpoint framework.

Study	Population / design	Intervention	Key findings relevant to BALIMONT
Milajerdi 2020 [4]	42 RCTs; 2,258 participants total	Meta-analysis of probiotic supplementation	Significant reductions in hs-CRP, TNF-alpha, and IL-6; significant increase in IL-10.
Faghfouri 2023 [5]	Umbrella meta-analysis; 39 qualified analyses	Probiotic supplementation across adult inflammatory conditions	CRP, TNF-alpha, and IL-6 were significantly reduced; supports anti-inflammatory adjuvant potential.
Ringel-Kulka 2011 [6]	60 adults with functional bowel disorders; double-blind placebo-controlled	L. acidophilus NCFM + B. lactis Bi-07, 8 weeks	Bloating severity improved vs placebo at week 4 and change scores remained favorable through week 8.
Tamaki 2016 [7]	56 patients with mild-to-moderate active UC; randomized placebo-controlled multicenter	B. longum BB536 for 8 weeks	UCDAI, endoscopic index, and Mayo subscore decreased significantly within the probiotic arm; remission rate numerically favored BB536.
Tanaka 2020 [8]	100 overweight healthy adults; randomized placebo-controlled	Heat-killed L. plantarum L-137 for 12 weeks	Inflammation- and lipid-related markers improved; effects were stronger in participants with higher CRP.
Srivastava 2024 [9]	200 adults with IBS-D; randomized placebo-controlled	Live ES1 or heat-treated HT-ES1 B. longum CECT 7347 for 12 weeks	Both probiotic and postbiotic significantly reduced IBS-SSS and improved QoL and stool-related outcomes vs placebo.
Lazou-Ahrén 2025 [10]	66 adults >70 years with chronic low-grade inflammation; randomized placebo-controlled	L. plantarum HEAL9, 4 weeks	Fecal calprotectin decreased significantly vs placebo; CRP showed a nonsignificant downward trend.

Taken together, the external literature supports four clinically important aspects of the retained BALIMONT design: first, reduction of systemic inflammatory biomarkers; second, improvement in GI symptom burden; third, translational plausibility for postbiotic-enabled benefit; and fourth, biological relevance of barrier-associated readouts such as calprotectin or colonic tight-junction support. At the same time, the human literature remains strain-specific and population-dependent, and direct human confirmation of the exact BALIMONT formulation still requires a prospective registered study.

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4. Discussion

We interpret the BALIMONT composition as a layered biotic system rather than a simple multistrain probiotic. Lactobacillus acidophilus contributes a clinically familiar digestive and symptom-oriented component; Lactiplantibacillus plantarum adds a strong literature base in inflammation-related and postbiotic-like applications; Bifidobacterium longum contributes relevance to both symptom modulation and mucosal inflammatory disease; and the homologous postbiotic fraction increases translational plausibility for immediate bioactive exposure [1-3,6-10].

A major strength of the present paper is that we did not rely on a placebo-only narrative. Instead, we retained the original active-comparator logic and asked whether the public clinical literature supports the same direction of advantage that the BALIMONT benchmark program proposed. The answer is qualified but positive: published data repeatedly show that probiotic and postbiotic interventions can improve inflammation-related endpoints, but the magnitude of effect varies by strain, matrix, dose, host phenotype, and duration [4,5,8-10].

The most defensible translational overlap lies in hs-CRP/CRP, IL-6, TNF-alpha, calprotectin, and GI symptom outcomes. The literature is less mature for direct IL-10/TNF-alpha-ratio reporting in exact strain-matched adult cohorts, and therefore this ratio should be interpreted as a mechanistically coherent but still formulation-specific endpoint. Likewise, the retained BALIMONT comparator figures remain useful for endpoint prioritization and product differentiation, but they should not be read as substitutes for a registered human efficacy trial.

Accordingly, we view the present article as a publishable translational evidence paper rather than a claim of completed confirmatory efficacy for the exact BALIMONT product. That distinction does not weaken the paper; rather, it sharpens its scientific value by separating formulation-level signals from public clinical proof and by clarifying where the evidence is already strong and where prospective validation is still required.

5. Conclusion

BALIMONT, an immune-inflammatory biotic composition centered on Lactobacillus acidophilus LA-06, Lactiplantibacillus plantarum LPL28, and Bifidobacterium longum BL21 with homologous postbiotic fractions, is supported by a coherent translational evidence pattern. The retained formulation benchmarks favor stronger inflammatory suppression and barrier-support directionality than a live-bacteria-only comparator, and available human studies support clinically relevant effects on CRP-related inflammation, cytokine modulation, calprotectin, and gastrointestinal symptom burden. On the current evidence base, BALIMONT can be positioned as a differentiated immune-health biotic platform with a clear rationale for formal prospective validation.

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