

BIOME GUIDE PROTOCOL

Autoimmune Microbiome Protocol

Evidence-based prebiotic, probiotic, and dietary strategies
to restore immune balance through the gut-immune axis

Covers: Rheumatoid Arthritis | Hashimoto's Thyroiditis | Multiple Sclerosis | General Autoimmune

Based on 19 systematic reviews, meta-analyses, and RCTs from PubMed | March 2026

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What This Protocol Addresses

Autoimmune diseases occur when the immune system mistakenly attacks the body's own tissues. Over 80 autoimmune conditions have been identified, collectively affecting roughly 5-8% of the global population. While genetics load the gun, emerging research reveals that the gut microbiome pulls the trigger. A growing body of evidence from systematic reviews and meta-analyses firmly establishes gut dysbiosis as a central driver of autoimmune pathology through the gut-immune axis.

This protocol targets the shared microbial imbalance found across autoimmune conditions, with condition-specific guidance for rheumatoid arthritis (RA), Hashimoto's thyroiditis, and multiple sclerosis (MS). By restoring depleted SCFA-producing bacteria, rebalancing the Th17/Treg immune axis, repairing intestinal permeability, and providing targeted nutritional support, you can address the root microbial drivers of autoimmune inflammation.

Timeline expectation: Autoimmune conditions develop over years and require patience to address. Subtle improvements in energy and digestive comfort typically emerge within weeks 2-4. Reductions in inflammatory markers (CRP, TNF-alpha) are measurable by weeks 4-8 based on RCT timelines. Meaningful improvements in disease-specific symptoms (joint pain, thyroid antibodies, EDSS scores) are expected by months 2-3. Full microbial remodeling takes 3-6 months of consistent adherence. This protocol complements your medical treatment; it does not replace it.

The Gut-Autoimmune Connection

Your gut houses approximately 70% of your immune system. The relationship between gut microbiota and autoimmunity operates through four core mechanisms that have been validated across multiple systematic reviews and meta-analyses.

- 1. Intestinal Permeability ("Leaky Gut"):** Dysbiosis weakens tight junctions between epithelial cells, allowing bacterial products (LPS, peptidoglycan) and food antigens to cross the intestinal barrier into systemic circulation, triggering chronic immune activation. In RA, *Collinsella aerofaciens* directly increases intestinal permeability (Chen et al., 2026).
- 2. Molecular Mimicry:** Bacterial proteins structurally resemble human tissue antigens. The immune system, attacking bacterial proteins, cross-reacts with self-tissue. *Prevotella copri* in RA may trigger joint inflammation through molecular mimicry with HLA-DR-presented peptides (English et al., 2023).
- 3. Th17/Treg Imbalance:** Healthy gut microbiota promotes regulatory T cells (Tregs) that suppress autoimmunity. Dysbiosis shifts the balance toward pro-inflammatory Th17 cells that drive tissue damage. SCFA-producing bacteria (*Faecalibacterium*, *Roseburia*) promote Treg differentiation via butyrate; their depletion tips the balance toward Th17 dominance (Fatima et al., 2025).
- 4. SCFA Depletion:** Butyrate, propionate, and acetate are critical immune modulators. RA patients show depleted fecal concentrations of all major SCFAs. In animal models, butyrate supplementation

before disease onset prevents arthritis by promoting Treg cells and dampening germinal center responses (Chen et al., 2026).

What the meta-analyses show: Vineesh et al. (2025) found a risk ratio of 1.58 (95% CI: 1.47-1.69) for microbiota-directed interventions improving autoimmune outcomes across 10 studies. Ashkanani et al. (2026) meta-analyzed 28 RCTs (2,002 patients): significant reductions in CRP (SMD -0.67, $p < 0.001$), TNF-alpha (SMD -1.81), and increased anti-inflammatory IL-10 (SMD 2.65).

Sources: Fatima et al. (2025) Microbial Pathogenesis. DOI: 10.1016/j.micpath.2025.107882; English et al. (2023) Microorganisms. DOI: 10.3390/microorganisms11071727; Vineesh et al. (2025) Cureus. DOI: 10.7759/cureus.89300; Ashkanani et al. (2026) Nutrients. DOI: 10.3390/nu18040560

The Autoimmune Microbial Fingerprint

Meta-analysis findings reveal consistent reduction in microbial diversity across autoimmune diseases (Adawi, 2025). The shared dysbiosis pattern involves depletion of protective, SCFA-producing bacteria and enrichment of pro-inflammatory species. Understanding this fingerprint is the foundation for targeted restoration.

Depleted taxa (targets for restoration):

Bacterium	Role	Depleted In
<i>Faecalibacterium prausnitzii</i>	Major butyrate producer, anti-inflammatory (inhibits NF-κB), promotes Tregs	RA, MS, general autoimmune
<i>Bifidobacterium</i> spp.	Immune regulation, Treg promotion, barrier support, SCFA production	RA, Hashimoto's, MS, general autoimmune
<i>Lactobacillus</i> spp.	Lactic acid production, immune modulation, barrier support	Hashimoto's, MS, general autoimmune
<i>Roseburia</i> spp.	Butyrate producer, gut barrier maintenance	RA, general autoimmune
<i>Parabacteroides distasonis</i>	Anti-inflammatory, restores Th17/Treg balance	RA (inversely correlated with severity)
<i>Bacteroides</i> spp.	SCFA production, immune education	RA (early stage), some autoimmune

Enriched taxa (pro-inflammatory, elevated in autoimmune):

Bacterium	Concern	Enriched In
<i>Prevotella copri</i>	Molecular mimicry with joint antigens, drives Th17 expansion	RA (hallmark in new-onset RA)
<i>Collinsella aerofaciens</i>	Increases intestinal permeability, correlates with inflammatory activity	RA (established disease)
<i>Akkermansia muciniphila</i>	Induces proinflammatory responses in MS context (opposite of most conditions)	MS (ELEVATED)
<i>Streptococcus</i> spp.	Pro-inflammatory	MS, general autoimmune
Proteobacteria	LPS-producing, pro-inflammatory	Hashimoto's, general autoimmune

CRITICAL NOTE FOR MS PATIENTS: *Akkermansia muciniphila* is ELEVATED in multiple sclerosis, unlike most conditions where it is considered beneficial. In the MS context, *Akkermansia* induces proinflammatory responses. This means polyphenol supplementation aimed at boosting *Akkermansia* should be AVOIDED by MS patients. This protocol provides an MS-specific variant of the prebiotic shake that omits polyphenol powder. RA and Hashimoto's patients may safely include polyphenols.

Sources: Chen et al. (2026) PMC12833903; Nemati et al. (2025) Biology. DOI: 10.3390/biology14040435; Gong et al. (2021) Front Endocrinol. DOI: 10.3389/fendo.2021.774362; Tsetseri et al. (2023) Rheumatology. DOI: 10.1093/rheumatology/kead163

What to AVOID

Processed foods and emulsifiers: Carboxymethylcellulose (CMC) and polysorbate-80 directly damage your intestinal mucus layer and promote dysbiosis. In autoimmune conditions where intestinal permeability is already compromised, these additives are especially harmful. Read ingredient labels carefully.

Refined sugar: Promotes Proteobacteria growth and fuels systemic inflammation. High sugar intake is associated with increased Th17 activity and worsened autoimmune flares.

Excessive dairy (RA-specific): Casein may trigger immune responses through molecular mimicry. Eliminate dairy completely during Phase 1 (first 8 weeks), then reintroduce cautiously in Phase 2 to assess personal tolerance.

Gluten (if sensitive): Non-celiac gluten sensitivity overlaps significantly with autoimmune conditions. Gluten activates the zonulin pathway, increasing intestinal permeability. Consider a 4-6 week elimination trial during Phase 1.

Excessive alcohol: Increases intestinal permeability and disrupts microbiome balance. Particularly harmful when combined with immunosuppressant medications.

Nightshades (RA consideration): Some RA patients report flares with tomatoes, peppers, and eggplant. An elimination trial may help identify personal triggers.

Excess raw cruciferous vegetables (Hashimoto's): Goitrogens in raw broccoli, cauliflower, and kale can interfere with thyroid hormone production. Cooking significantly reduces goitrogen content; cooked cruciferous vegetables are fine in moderation.

Dietary Recommendations

Anti-Inflammatory Mediterranean Framework

The Mediterranean diet pattern has the strongest evidence base for autoimmune conditions. It naturally provides anti-inflammatory omega-3 fatty acids, polyphenols, and prebiotic fibers while limiting pro-inflammatory processed foods.

Emphasize daily: Fatty fish (salmon, sardines, mackerel) for omega-3s; extra virgin olive oil; colorful vegetables; nuts and seeds; berries and pomegranate. **Prebiotic-rich foods:** Onions, garlic, leeks, and asparagus are natural sources of inulin and FOS that feed depleted *Bifidobacterium* and *Faecalibacterium*. Cooled rice and potatoes provide resistant starch for butyrate production.

Condition-Specific Dietary Guidance

Rheumatoid Arthritis: Prioritize omega-3 rich foods (fatty fish 3-4x/week). Consider a 4-6 week elimination of dairy and gluten to identify personal triggers. Include turmeric (with black pepper) in cooking for anti-inflammatory benefit.

Hashimoto's Thyroiditis: Ensure adequate but not excessive iodine intake. Selenium-rich foods are especially important: Brazil nuts (1-2/day provides ~200 mcg selenium), sardines, and eggs. Cook cruciferous vegetables rather than eating them raw.

Multiple Sclerosis: Emphasize omega-3 rich foods heavily. Follow Wahls Protocol principles where practical (9 cups of vegetables/fruits daily). Polyphenol-rich foods like berries are fine in normal dietary amounts, but avoid concentrated polyphenol supplements aimed at boosting *Akkermansia*.

Supplement Protocol

Prebiotic Supplements (Foundation)

These prebiotic fibers feed your depleted beneficial bacteria. The prebiotic approach is the foundation of this protocol because it restores your own endogenous flora rather than relying solely on external probiotics. Start with half doses for the first week.

Prebiotic	Feeds	Autoimmune Notes	Dose
Inulin / FOS	<i>Bifidobacterium</i> (strong), <i>Faecalibacterium</i>	Restores depleted Bifidobacterium across all three conditions	Start 1/2 tsp, titrate to 1 tsp
GOS	<i>Bifidobacterium</i> (strongest bifidogenic), <i>Lactobacillus</i>	Highly selective; especially important for Hashimoto's where both genera depleted	3.5g/day
Resistant Starch	<i>Roseburia</i> , <i>Faecalibacterium</i> , <i>R. bromii</i>	Butyrate production critical for Treg promotion in autoimmune	1 heaping Tbsp/day
Apple Pectin	<i>Faecalibacterium</i> , <i>Eubacterium</i>	Gentle fermentation; good for patients on immunosuppressants	1 heaping Tbsp/day
Arabinoxylans	<i>Bifidobacterium</i> , <i>Roseburia</i>	Bifidogenic; supports SCFA production	1 heaping Tbsp/day
Polyphenols	<i>Akkermansia muciniphila</i>	RA and Hashimoto's ONLY. AVOID for MS patients (<i>Akkermansia</i> is elevated and proinflammatory in MS)	1/2 tsp berry powder

Probiotic Recommendations

This protocol is primarily prebiotic-focused because probiotic evidence in autoimmune conditions is moderate, not strong. However, several strains have RCT support and provide meaningful additional benefit alongside the prebiotic foundation.

Strain	Evidence	Dose	For
<i>L. acidophilus</i> + <i>L. casei</i> + <i>B. bifidum</i>	RCT (n=60, 8 wks): Significant DAS28 improvement (p<0.05), reduced hs-CRP. Most studied combo in RA. (Zamani et al., 2016)	2x10 ⁹ CFU each, daily	RA (primary)
<i>L. casei</i> 01	RCT (n=46, 8 wks): Reduced DAS28, tender joints, TNF-alpha. (Vaghef-Mehrabany et al., 2014)	10 ⁸ CFU/day	RA (add-on)

Strain	Evidence	Dose	For
<i>L. acidophilus</i> + <i>L. casei</i> + <i>L. fermentum</i> + <i>B. infantis</i>	RCT (n=60, 12 wks): Improved EDSS scores, reduced hs-CRP, improved mental health. (Kouchaki et al., 2017)	Multi-strain, daily	MS
General multi-strain	Limited direct RCT evidence for probiotics in Hashimoto's. Use general multi-strain with Bifidobacterium and Lactobacillus to support depleted genera.	Per product label	Hashimoto's

Choosing your strains: Select the probiotic combination that matches your primary condition. For RA, the triple combination of *L. acidophilus* + *L. casei* + *B. bifidum* has the strongest evidence. For MS, look for a multi-strain product containing *L. acidophilus*, *L. casei*, *L. fermentum*, and *B. infantis*.

Meta-analysis summary: Zeng et al. (2022) analyzed 10 RA RCTs (632 participants) and found significant CRP reduction (p=0.03). Zangeneh et al. (2025) found probiotics significantly reduced EDSS scores in MS across 6 RCTs.

Supporting Supplements

Supplement	Why	Dose	Duration
Vitamin D3	VITAL Trial landmark: 25,871 participants, 5.3-yr RCT. Vitamin D reduced confirmed autoimmune disease by 22% (HR 0.78). Promotes Tregs, modulates Th17. (Costenbader et al., 2024)	2,000-5,000 IU/day (test levels; target 40-60 ng/mL)	Ongoing; retest at 3 months
Omega-3 (EPA/DHA)	VITAL Trial: sustained autoimmune reduction at 7 years (HR 0.83). Anti-inflammatory via SPM production. Higher dose than general health. (Costenbader et al., 2024; Gkiouras et al., 2024)	2-3g/day total EPA+DHA	Ongoing
Sodium Butyrate	Directly addresses core SCFA depletion across all autoimmune conditions. In RA animal models, butyrate prevents arthritis by promoting Treg cells. (Chen et al., 2026)	300-600 mg/day microencapsulated	First 60 days
Curcumin	Anti-inflammatory; moderate evidence for RA joint inflammation. Bioavailability requires piperine (black pepper extract) co-administration.	500-1,000 mg/day with piperine	Ongoing
Vitamin A (Retinol)	Supports mucosal immunity and Treg differentiation. Short-term use only due to toxicity risk. Contraindicated in pregnancy.	10,000-25,000 IU/day	Phase 1 only (4-8 weeks)
Selenium (Hashimoto's)	Meta-analysis of 35 RCTs (2,358 patients): significantly reduced TPO antibodies (SMD -0.96), reduced TSH, decreased oxidative stress. Moderate certainty evidence. (Huwiler et al., 2024)	200 mcg/day selenomethionine	6-12 months; retest TPO antibodies

Safety notes: Test vitamin D levels (25(OH)D) before supplementing at higher doses. Vitamin A should NOT exceed 25,000 IU/day and is contraindicated in pregnancy; use only during Phase 1. Selenium has a narrow therapeutic window; do not exceed 400 mcg/day. If you take immunosuppressant medications, consult your rheumatologist or neurologist before starting any new supplement. Omega-3 at high doses may increase bleeding risk; discuss with your provider if you take blood thinners.

The Daily Protocol

The Daily Prebiotic Shake

The Daily Prebiotic Shake (Standard: RA and Hashimoto's)

1. Add at least 12 oz of water to a shaker bottle or blender
2. Add 1 heaping tablespoon of stabilized rice bran (arabinoxylans)
3. Add 1 heaping tablespoon of apple pectin powder
4. Add 1 heaping tablespoon of resistant starch (potato starch or Hi-Maize 260)
5. Add 1 heaping teaspoon of inulin powder (start with 1/2 tsp week 1)
6. Add 1/2 teaspoon berry polyphenol powder (for *Akkermansia* support)
7. Shake well and drink!

Timing: Twice daily during Phase 1 (morning and evening). **Week 1:** Use HALF of all prebiotic doses. Increase to full dose by week 2-3 as tolerated.

MS VARIANT: Omit the polyphenol powder. Because *Akkermansia muciniphila* is already elevated and proinflammatory in MS, MS patients should follow the shake recipe above but SKIP step 6 (berry polyphenol powder). All other prebiotic components remain the same. Normal dietary intake of berries and polyphenol-rich foods is fine; it is the concentrated supplemental form that should be avoided.

The Two-Phase Protocol

Phase 1: Active Immune Modulation (Weeks 1-8)

During Phase 1, you are actively rebuilding protective gut flora, rebalancing the Th17/Treg axis, and reducing systemic inflammation. This phase requires the most consistency and is designed to complement your existing medical treatment.

- Daily prebiotic shake TWICE daily (start half-dose week 1, full dose weeks 2-8)
- Condition-specific probiotic(s): take daily with or without food
- Vitamin D3: 5,000 IU/day with a fat-containing meal
- Omega-3 (EPA/DHA): 2-3g/day with meals
- Sodium butyrate: 300-600 mg/day with meals
- Vitamin A: 10,000 IU/day (short-term immune support)
- Curcumin: 500-1,000 mg/day with piperine
- Hashimoto's add: Selenium 200 mcg/day selenomethionine

- RA/Hashimoto's: include polyphenol powder in shake; MS: OMIT polyphenol powder
- Follow anti-inflammatory Mediterranean diet; eliminate dairy/gluten if applicable
- Avoid processed foods, refined sugar, emulsifiers, and excessive alcohol

Phase 2: Maintenance (Week 9 Onward)

In Phase 2, you transition to a sustainable maintenance routine. The goal is to maintain the microbial and immune gains achieved in Phase 1.

- Reduce prebiotic shake to once daily
 - Continue probiotics (can rotate strains every 2-3 months)
 - Continue vitamin D3 (retest at 3 months; adjust to maintenance 2,000 IU/day if levels adequate)
 - Continue omega-3 at 2-3g/day
 - Discontinue sodium butyrate (your own bacteria should now produce more)
 - Discontinue vitamin A (toxicity risk with long-term use)
 - Continue curcumin as needed for inflammation management
 - Continue selenium (Hashimoto's) for 6-12 months total; retest TPO antibodies
 - Begin cautious reintroduction of eliminated foods (one at a time, 3-day intervals)
 - Introduce fermented foods gradually: kefir, sauerkraut, kimchi in small amounts
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What to Expect

Timeframe	What You May Experience
Week 1	Adjustment period. Mild increase in gas or bloating as your microbiome begins to shift. This is normal and subsides as your gut adapts to the prebiotic fibers. The half-dose start minimizes discomfort.
Weeks 2-4	Digestive comfort improves. Energy may begin to increase as systemic inflammation starts to decrease. Omega-3 and curcumin provide early anti-inflammatory relief. Vitamin D levels begin to rise.
Weeks 4-8	Measurable reductions in inflammatory markers (CRP, TNF-alpha) based on RCT timelines. RA: reduced joint tenderness and DAS28 scores. MS: potential EDSS improvement. Hashimoto's: selenium begins reducing TPO antibodies.
Months 2-3	Continued improvement in disease-specific symptoms. Better stress resilience as the gut-immune axis normalizes. Reduced frequency and severity of autoimmune flares. Transition to Phase 2 maintenance.
Months 3-6	Full microbial remodeling. Measurable changes on microbiome testing: increased <i>Bifidobacterium</i> , <i>Faecalibacterium</i> , and <i>Roseburia</i> ; improved diversity. Retest vitamin D levels and thyroid antibodies (Hashimoto's). Many patients report a meaningful improvement in quality of life at this stage.

Tracking Your Progress

Work with your healthcare provider to monitor objective markers of disease activity. For RA, track CRP, ESR, and DAS28 scores. For Hashimoto's, monitor TSH, free T4, and TPO antibody levels. For MS, EDSS scores and MRI findings provide objective tracking. Keep a simple daily journal noting energy levels, joint pain/stiffness (0-10), digestive symptoms, and any flare triggers.

Consider a microbiome test (such as Biomesight, Ombre, or Thryve) at baseline and after 3-6 months to objectively measure changes in your *Bifidobacterium*, *Faecalibacterium*, *Roseburia*, and overall diversity. For RA patients, tracking *Prevotella copri* levels can provide insight into whether the dysbiosis is resolving.

Learn more at BiomeGuide.com

Every probiotic strain and prebiotic mentioned in this protocol has a detailed profile page on our site with links to the original research. Visit biomeguide.com to explore our probiotic strain database, condition-specific guides, and microbiome testing resources.

Sources

Every recommendation in this protocol is based on published, peer-reviewed clinical research. Below is the complete citation list with DOIs for verification.

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This information is for educational purposes only and is not medical advice. Consult your healthcare provider before starting any new supplement regimen, especially if you take immunosuppressant medications, disease-modifying antirheumatic drugs (DMARDs), or other prescriptions. These protocols are designed to complement, not replace, your medical treatment. Individual results may vary based on disease severity, duration, and treatment history. If your symptoms are worsening rapidly, you experience new neurological symptoms, severe joint swelling, or signs of thyroid crisis, seek medical evaluation promptly. BiomeGuide.com is not affiliated with any specific supplement manufacturer.

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