Beta Glucan and Cold and Flu

1. Introduction to Beta Glucan & Cold and Flu

- Yeast (1,3)-(1,6)-beta-glucans (YBG) are polysaccharides from Saccharomyces cerevisiae that interact with innate immunity.
- Across multiple randomized, double-blind, placebo-controlled trials, YBG reduced upper respiratory tract infection (URTI) burden (incidence, duration, and/or severity).
- Proposed actions include support of mucosal immunity (e.g., salivary IgA) and modulation of inflammatory tone.

2. Beta Glucans as Immunomodulators

- Bind pattern-recognition receptors Dectin-1 and CR3 on macrophages, dendritic cells, and neutrophils; trigger innate → adaptive responses.
- Oral YBG is sampled in gut-associated lymphoid tissue, processed to fragments, and trafficked to lymph nodes and bone marrow.
- Supports trained immunity: prior exposure can heighten non-specific responses to subsequent pathogens.

3. Mechanisms of Action

- Mucosal defense: increased salivary IgA after strenuous exercise (+32% at 2 h vs placebo).
- Symptom mitigation: anti-inflammatory cytokine shifts (e.g., IL-10 ↑) and increased effector cell availability (WBC ↑ in children).
- Receptor signaling: Dectin-1/TLR/CR3 engagement → NF-κB/MAPK pathways; enhances phagocytosis and antigen presentation.

4. Role of Beta Glucans in Cold and Flu

- Healthy adults with recurrent colds: –25% symptomatic common colds vs placebo (p=0.041); 15% lower mean symptom score; sleep disturbances improved.
- Athletes under immune stress: –37% cold/flu symptomatic days post-marathon; URTI days and severity reduced; fewer missed workouts.
- Children (1–4 y): fewer episodes and shorter ARI duration; less antibiotic use and fewer missed daycare days; illness in 32–47% on YBG vs 85% placebo.
- Older adults: pilot data show higher post–influenza A antibody titers with insoluble YBG; other pilots show mixed results by dose/solubility and strain.
- Meta-analytic signal: yeast beta-glucans reduce URTI incidence, number, and duration across trials.

5. Broader Health Benefits

- Well-being: improved mood metrics (e.g., higher joy subscore) during URTI episodes.
- Cardiometabolic: modest reductions in systolic blood pressure in those with elevated baselines.
- Function: better sleep during colds; in athletes, quicker return to training.

6. Practical Considerations

- Populations studied: healthy adults (including recurrent colds), endurance athletes, children (1–4 y), and older adults.
- Dosing in trials: generally 250–900 mg/day in adults; pediatric courses ~35–100 mg/day; some benefits at 35 mg/day.
- Form matters: insoluble yeast (1,3)-(1,6)-beta-glucans show consistent activity; effects vary by source, solubility, and particle size.
- Safety: well tolerated in trials; adverse events similar to placebo. Avoid use with transplant-related immunosuppression unless supervised.
- Adjunct, not replacement: compatible with routine vaccines and standard URTI care; evidence for vaccine adjuvancy is promising but mixed.

7. Summary Takeaway

- Oral yeast (1,3)-(1,6)-beta-glucans modestly but consistently lessen common cold/URTI burden and support mucosal immunity.
- Benefits appear across age groups and under physiologic stress; vaccine antibody responses may improve in some older adults.
- Use preparation-specific dosing and document product type (source, solubility, structure); align with overall prevention strategies.

Abbreviations: URTI=upper respiratory tract infection; ARI=acute respiratory infection; YBG=yeast beta-glucan; IgA=immunoglobulin A. Evidence summarized from RCTs and pi