Beta Glucan and COVID-19

1. Introduction to Beta Glucan & COVID-19

• Beta-glucans are glucose polymers from fungi, yeast, and cereals; fungal forms (beta-(1,3)/(1,6)) show strongest immune effects.

• COVID-19 involves immune dysregulation: cytokine storm, hypercoagulation, and sepsis-like inflammation.

• Beta-glucans act as Biological Response Modifiers (BRMs) with potential to support prevention, vaccination, and recovery.

2. Beta Glucans as Immunomodulators

• Bind to Dectin-1, TLRs, and CR3 on immune cells, activating macrophages, dendritic cells, and NK cells.

• Balance inflammatory responses, reducing risk of overactivation while enhancing pathogen clearance.

• Proposed as safe adjuvants to strengthen vaccine responses and limit ADE (antibody-dependent enhancement).

3. Mechanisms of Action

• Trained Immunity (TRIM): primes innate immune cells for faster, broader future responses.

• Cytokine storm mitigation: lowers IL-6 and IL-1beta, key drivers of ARDS and severe COVID-19.

• Improves immune ratios like NLR (down) and LCR (up), correlating with lower disease severity.

• Reduces D-Dimer, addressing COVID-19-related coagulopathy and clot risk.

4. Role of Beta Glucans in COVID-19

• Pilot studies with Aureobasidium pullulans strains showed reduced IL-6, D-Dimer, and improved T cell counts by day 30.

• Adjunct use with COVID-19 vaccines increased antibody levels (IgG, IgM) and T cell subsets vs placebo.

• Balanced immune modulation helps prevent both cytokine storm and later immune paralysis phases seen in severe cases.

• Potential to support recovery and long-COVID by sustaining reduced inflammation post-acute phase.

5. Broader Health Benefits

• Metabolic regulation: improves glucose and lipid balance, relevant to diabetes and obesity risks.

• Anti-inflammatory and antioxidant activity with systemic benefits beyond respiratory health.

• Historical use as adjuvants for other vaccines like influenza and hepatitis.

6. Practical Considerations

• Sources matter: fungal and yeast beta-glucans have branched beta-(1,3)/(1,6) structure for higher bioactivity.

• Aureobasidium pullulans exopolysaccharides avoid harsh extraction and maintain purity.

• Typical studied doses range from 250-500 mg/day in supplement form.

• Safe profile in human trials; can be combined with standard care under medical supervision.

7. Summary Takeaway

• Beta-glucans offer a multi-pronged approach to COVID-19 by modulating immunity, reducing inflammation, and improving coagulation balance.

• Act as safe nutritional adjuncts to vaccination and treatment, supporting both prevention and recovery.

• Evidence suggests benefits extend to long-term immune health and protection against future viral threats.