

AI-Driven Phytochemical Formulation for Psychosis Management

Seshat AI for Targeted Supplement Medicine

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1 Introduction

Psychosis is a mental health condition characterized by hallucinations, delusions, cognitive dysfunction, and emotional disturbances. It is associated with dopaminergic dysregulation, neuroinflammation, oxidative stress, and neurotransmitter imbalances. This AI-driven phytochemical formulation targets multiple pathways to modulate dopamine, reduce inflammation, regulate neurotransmitters, and support cognitive function.

2 Key Phytochemicals and Mechanisms

2.1 Dopamine and Glutamate Modulation

- **Curcumin (200 mg)**: Modulates dopamine D2 receptors, reducing excess dopamine transmission in psychotic states (Gupta et al., 2013).
- **Resveratrol (150 mg)**: Reduces dopamine hyperactivity and prevents glutamate excitotoxicity, protecting neurons (Bhat et al., 2017).
- **N-acetylcysteine (NAC) (200 mg)**: Restores glutamate balance, protecting against NMDA receptor dysfunction in schizophrenia (De Almeida et al., 2017).

2.2 Neuroinflammation Reduction

- **Boswellic Acid (200 mg)**: Inhibits 5-LOX and NF- κ B, reducing neuroinflammatory cytokines that contribute to psychosis (Sengupta et al., 2011).
- **Quercetin (100 mg)**: Inhibits mast cell activation, reducing oxidative stress and inflammatory brain signaling (Lesiak et al., 2010).

2.3 Neurotransmitter Regulation

- **Epigallocatechin Gallate (EGCG) (100 mg):** Increases GABAergic signaling, reducing anxiety and psychotic agitation (Manczak et al., 2010).
- **Palmitoylethanolamide (PEA) (300 mg):** Modulates CB2 cannabinoid receptors, reducing neuroinflammation and anxiety-related symptoms (Skaper et al., 2018).

2.4 Cognitive Protection & Neurogenesis

- **Alpha-Lipoic Acid (ALA) (300 mg):** Enhances mitochondrial function, reducing oxidative stress-related cognitive impairment (Ziegler et al., 2011).
- **Withanolide A (100 mg):** Promotes hippocampal neurogenesis, improving memory and cognitive flexibility (Choudhary et al., 2017).

2.5 Bioavailability & Synergy Enhancers

- **Piperine (10 mg):** Increases bioavailability of Curcumin, Resveratrol, and Boswellic Acid (Shoba et al., 1998).
- **Liposomal Encapsulation & Fermentation:** Improves gut absorption and systemic circulation of phytochemicals (Li et al., 2017).

3 Regulatory Considerations

This formulation aligns with:

- **FDA GRAS** (Generally Recognized as Safe) compliance for individual phytochemicals.
- **WHO & EFSA Guidelines** ensuring safe intake for psychiatric nutraceuticals.
- **Clinical Trials Requirement:** Preclinical and randomized controlled trials (RCTs) are necessary for human validation.

4 Conclusion

This AI-driven phytochemical supplement integrates dopamine modulation, neuroprotection, and anti-inflammatory compounds for psychosis management. Future research must include rigorous clinical trials to validate safety and efficacy.

Disclaimer: This formulation is for research purposes only and has not been tested in humans. Clinical validation is required before any medical application.

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