

**Specific Formulation of *Camellia sinensis* Prevents Cold and Flu Symptoms and  
Enhances  $\gamma\delta$  T Cell Function: A Randomized, Double-Blind, Placebo-Controlled  
Study**

**Running title:**

**CSF Prevents Cold and Flu Symptoms**

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**ABSTRACT**

**Objective:** Determine if a specific formulation of *Camellia sinensis* (CSF) can prevent illness and symptoms due to cold and flu, and enhance  $\gamma\delta$  T cell function

**Methods:** Design: Randomized, double-blind, placebo-controlled study. Subjects: Healthy adults 18-70 years old. Intervention: Proprietary formulation of *Camellia sinensis* (green tea) capsules, or a placebo, twice a day, for 3 months. Measures of Outcome: As assessed by daily symptom logs, percentage of subjects experiencing cold and flu symptoms, number of days subjects experienced symptoms, and percentage of subjects seeking medical treatment. Mean *in vivo* and *ex vivo* proliferative and interferon gamma responses of subjects' peripheral blood mononuclear cells to  $\gamma\delta$  T cell antigen stimulation.

**Results:** Among subjects taking CSF there were 32.1% fewer subjects with symptoms (P=0.035), 22.9% fewer overall illnesses of at least 2 days duration (P=0.092), and 35.6% fewer symptom days (P<0.002), compared to subjects taking placebo.  $\gamma\delta$  T cells from subjects taking CSF proliferated 28% more (P=0.017) and secreted 26% more IFN- $\gamma$  (P=0.046) in response to  $\gamma\delta$  T cell antigens, as compared to  $\gamma\delta$  T cells from subjects taking placebo. CSF was well-tolerated.

**Conclusions:** This proprietary formulation of CSF is a safe and effective dietary supplement for preventing cold and flu symptoms, and for enhancing  $\gamma\delta$  T cell function.