

**Table 4. Immunomodulatory Polysaccharide Products: Oral Human Studies**

Extract	Source	Study design	Population	N (experimental/control)	Dose/day	Duration	Significant effects	Reference
Arabinogalactans	<i>Larix occidentalis</i>	Randomized, double-blind, placebo-controlled	Healthy adults	8/15	4 g	6 weeks	↑ % CD8+ lymphocytes & blood lymphocyte proliferation	[18]
Arabinogalactans (ResistAid™)			Healthy adults given pneumococcal vaccinations day 30	21/24	4.5 g	72 days	↑ plasma IgG subtypes	[19]
Fucoidans	<i>Undaria pinnatifida</i> sporophylls	Randomized, single-blind, placebo-controlled	Healthy adults	25 (75% fucoidan, 6 (10% fucoidan)/6	3 g	12 days	75% fucoidan: ↓ #s blood leukocytes, lymphocytes' ↑ plasma stromal derived factor-1, IFN-γ, CD34+ cells; ↑ % CXCR4-expressing CD34+ cells	[21]
Furanose extract (Cold-FX®)	<i>Panax quinquefolium</i>	Randomized, double-blind, placebo-controlled	Healthy older adults given influenza immunization at the end of week 4	22/21	400 mg	4 months	During weeks 9-16, ↓ incidence of acute respiratory illness, symptom duration	[20]
Glucans	<i>Agaricus subrufescens</i>	Randomized, double-blind, placebo-controlled	Cervical, ovarian or endometrial cancer patients receiving 3 chemotherapy cycles	39/61	5.4 g (estimated)	6 weeks	↑ NK cell activity, ↓ chemotherapy side effects	[64]
Glucans (β-1,3;1,6)	Not identified	Placebo-controlled	Recurrent aphthous stomatitis patients	31/42	20 mg	20 days	↑ PBL lymphocyte proliferation, ↓ Ulcer Severity Scores	[48]
Glucans (β-1,3;1-6)	<i>S. cerevisiae</i>	Randomized, double-blind, placebo-controlled	Adults with seasonal allergic rhinitis	12/12	20 mg	12 weeks	30 minutes after nasal allergen provocation test, nasal lavage fluid: ↓ IL-4, IL-5, % eosinophils, ↑ IL-12	[47]
Glucans (PSK)	<i>Trametes versicolor</i>	Randomized, controlled	Patients with curatively resected colorectal cancer receiving chemotherapy	221/227	200 mg	3-5 years	↑ disease-free survival and overall survival	[56]
		Controlled	Post-surgical colon cancer patients receiving chemotherapy	123/121	3 g for 4 weeks, alternating with 10 4-week courses of chemotherapy	7 years	↑ survival from cancer deaths; no difference in disease-free or overall survival	[57]

			Post-surgical colorectal cancer patients receiving chemotherapy	137/68	3 g daily	2 years	↑survival in stage III patients; ↓ recurrence in stage II & III patients	[58]
			Post-surgical gastric cancer patients receiving chemotherapy	124/129	3 g for 4 weeks, alternating with 10 4-week courses of chemotherapy	5-7 years	↑ 5-year disease-free survival rate, overall 5-year survival	[59]
			Pre-surgical gastric or colorectal cancer patients	16 daily; 17 every other day/13	3 g daily or on alternate days before surgery	<14 days or 14-36 days	≥14 day treatment: ↑ peripheral blood NK cell activity, PBL cytotoxicity, proportion of PBL helper cells; ↓ proportion of PBL inducer cells; <14 day treatment: ↑ PBL response to PSK and Con A, proportion of regional node lymphocyte suppressor cells	[62]
		Randomized, double-blind, placebo-controlled	Post-surgical stage III-IV colorectal cancer patients	56/55	3 g for 2 months, 2 g for 22 months, 1 g thereafter	8-10 years	↑ remission & survival rates	[61]
		Controlled	Post-surgical stage III gastric cancer patients receiving chemotherapy	32/21	3 g	1 year	↑ survival time	[60]
Glucans (PSP)	<i>Trametes versicolor</i>	Randomized, double-blind, placebo-controlled	Conventionally-treated stage III-IV non-small cell lung cancer patients	34/34	3.06 g	1 month	↑ blood IgG & IgM, total leukocyte and neutrophil counts, % body fat; ↓ patient withdrawal due to disease progression	[63]