

LACTOBACILLUS SALIVARIUS LS-33®

In vitro trials

Probiotic selection, survival, stability

1. Maragkoudakisa PA, Zoumpopoulou G, Miarisa C, Kalantzopoulou G, Potb B, Effie Tsakalidoua. 2006. Probiotic potential of *Lactobacillus* strains isolated from dairy products. *International Dairy Journal* 16: 189-199.

Immune system modulation

1. Gad M, Ravn P, Søborg DA, Lund-Jensen K, Ouwehand AC, Jensen SS. 2011. Regulation of the IL-10/IL-12 axis in human dendritic cells with probiotic bacteria. *FEMS Immunol Med Microbiol*. 63(1): 93-107.

2. Schmidt EGW, Claesson HM, Jensen SS, Ravn P, Kristensen NN. 2009. Antigen-presenting cells exposed to *Lactobacillus acidophilus* NCFM, *Bifidobacterium bifidum* Bi-98 and BI-504 reduce regulatory T cell activity. *Inflamm Bowel Dis*. Available online, DOI 10.1002/ibd.21068.

3. Zoumpopoulou G, Tsakalidou E, Dewulf J, Pot B, Grangette. 2009. Differential crosstalk between epithelial cells, dendritic cells and bacteria in a co-culture model. *Int J Food Micro*. 131: 40-51.

4. Putaala H, Salusjärvi T, Nordström M, Saarinen M, Ouwehand AC, Bech-Hansen E, Rautonen N. 2008. Effect of four probiotic strains and *Escherichia coli* O157:H7 on tight junction integrity and cyclo-oxygenase expression. *Res Microbiol*. 159: 692-698.

5. Sokol H, Pigneur B, Watterlot L, Lakhdari O, Bermúdez-Humarán LG, Gratadoux JJ, Blugeon S, Bridonneau C, Furet JP, Corthier G, Grangette C, Vasquez N, Pochart P, Trugnan G, Thomas G, Blottière HM, Doré J, Marteau P, Seksik P, Langella P. 2008. *Faecalibacterium prausnitzii* is an anti-inflammatory commensal bacterium identified by gut microbiota analysis of Crohn disease patients. *PNAS*. 105: 16731-16736.

Antipathogenic/antitoxic activity

1. Collado MC, Meriluoto J, Salminen S. 2008. Adhesion and aggregation properties of probiotic and pathogen strains. *Eur Food Res Technol*. 226: 1065-1073.

Also listed under Adherence.

2. Collado MC, Meriluoto J, Salminen S. 2007. Role of commercial probiotic strains against human pathogen adhesion to intestinal mucus. *Lett Appl Microbiol*. 45: 454-460.

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Anti-pain/analgesic

1. Rousseaux C, Thuru X, Gelot A, Barnich N, Neut C, Dubuquoy L, Dubuquoy C, Merour E, Gebous K, Chamaillard M, Ouwehand A, Leyer G, Carcano D, Colombel JF, Ardid D, Desreumaux P. 2007 *Lactobacillus acidophilus* modulates intestinal pain and induces opioid and cannabinoid receptors. *Nat Med*. 13: 35-37.

Animal trials

Safety

1. Daniel C, Poiret S, Goudercourt D, Dennin V, Leyer G, Pot B. 2006. Selecting lactic acid bacteria for their safety and functionality by use of a mouse colitis model. *Appl Environ Microbiol*. 72: 5799-5805.

Immune System Modulation

1. Danilo CA1, Constantopoulos E, McKee LA, Chen H, Regan JA, Lipovka Y, Lahtinen S, Stenman LK, Nguyen TV, Doyle KP, Slepian MJ, Khalpey ZI, Konhilas JP. 2017. *Bifidobacterium animalis* subsp. *lactis* 420 mitigates the pathological impact of myocardial infarction in the mouse. *Benef Microbes*. 8(2): 257-269. doi: 10.3920/BM2016.0119.
2. Macho Fernandez E, Valenti V, Rockel C, Hermann C, Pot B, Boneca IG, Grangette C. 2011. Anti-inflammatory capacity of selected lactobacilli in experimental colitis is driven by NOD2-mediated recognition of a specific peptidoglycan-derived muropeptide. *Gut*. 2011 Aug;60(8): 1050-9. doi: 10.1136/gut.2010.232918. Epub 2011 Apr 6. Erratum in: *Gut*. 2011 Oct;60(10): 1444. Fernandez, Elise Macho [corrected to Macho Fernandez, Elise]. PubMed PMID: 21471573.
3. Macho Fernandez E, Pot B, Grangette C. 2011. Beneficial effect of probiotics in IBD: Are peptidoglycan and NOD2 the molecular key effectors? *Gut Microbes*. 2011 Sep 1;2(5). [Article addendum to Fernandez et al., 2011]
4. Petersen ER, Claesson MH, Schmidt EG, Jensen SS, Ravn P, Olsen J, Ouwehand AC, Kristensen NN. 2011. Consumption of probiotics increases the effect of regulatory T cells in transfer colitis. *Inflamm Bowel Dis*. 2011 Apr 14.
5. Foligné B, Nutten S, Grangette C, Dennin V, Goudercourt D, Poiret S, Dewulf J, Brassart D, Mercenier A, Pot B. 2007. Correlation between *in vitro* and *in vivo* immune modulatory properties of lactic acid bacteria. *World J Gastroenterol*. 13: 236-243.
6. Foligné B, Zoumpopoulou G, Dewulf J, Ben Younes A, Chareyre F, Sirard JC, Pot B, Grangette C. 2007. A key role of dendritic cells in probiotic functionality. *PLoS ONE* 2: e313.

7. Foligné B, Grangette C, Pot B. 2005. Probiotics in IBD: mucosal and systemic routes of administration may promote similar effects. *Gut* 54: 727-728.

Protective effect against colitis

1. Grangette C, Macho-Fernandez E, Pot B. 2011. Anti-inflammatory capacity of lactobacilli peptidoglycan: mucosal and systemic routes of administration promote similar effects - The Authors' reply. *Gut*. 2011 Dec 2. [Letter]
2. Matuchansky C. 2011. Anti-inflammatory lactobacilli: strain specificity. *Gut*. 2011, Aug 16. [Letter]

Human clinical studies

Immune system enhancement

1. Paineau D, Carcano D, Leyer G, Darquy S, Alyanakian MA, Simoneau G, Bergmann JF, Brassart D, Bornet F, Ouwehand AC. 2008. Effects of seven potential probiotic strains on specific immune responses in healthy adults: a double-blind, randomized, controlled trial. *FEMS Immunol Med Microbiol*. 53: 107-13.

Product functionality

1. Ding WK, Shah NP. 2009. Effect of various encapsulating materials on the stability of probiotic bacteria. *J Food Sci*. 74(2): M100-7.
2. Ding WK, Shah NP. 2007. Acid, bile and heat tolerance of free and microencapsulated probiotic bacteria. *J Food Sci*. 72: M446-M450.

Reviews

1. Shanahan F. 2011. Molecular mechanisms of probiotic action: it's all in the strains! *Gut Online*, April 20th 2011.

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