

Mutaflor® – Escherichia coli strain Nissle 1917

References

- 1) Escherich T. Die Darmbakterien des Neugeborenen und Säuglings. Fortschr Med 1885;3:515–522, 547–554.
- 2) Escherich T. Die Darmbakterien des Säuglings und ihre Beziehung zur Physiologie der Verdauung. Stuttgart: Verlag Ferdinand Enke, 1886.
- 3) Sonnenborn U, Stobernack HP, Proppert Y. Die Entwicklung der aeroben Darmflora bei Neugeborenen. Fortschr Med 1990;108:420–424.
- 4) Schröder H. Entwicklung der aeroben Darmflora bei Neugeborenen nach Kolonisierung mit dem E. coli-Stamm Nissle 1917. Der Kinderarzt 1992; 23(10): 1619–1625.
- 5) Hoogkamp-Korstanje JA et al. Composition and ecology of the human intestinal flora. Antonie Van Leeuwenhoek 1979; 45: 35–40.
- 6) Schulze J et al. Probiotika – Mikroökologie, Mikrobiologie, Qualität, Sicherheit und gesundheitliche Effekte. Hippokrates, Stuttgart, ISBN 978-3-8304-5356-7, 2008.
- 7) Bischoff SC. (Hrsg.) Probiotika, Präbiotika und Synbiotika. Georg Thieme Verlag, Stuttgart, ISBN 978-3-13-144891-0, 2009.
- 8) Rasche C et al. Differential immunomodulating effects of inactivated probiotic bacteria on the allergic immune response. Acta Derm Venereol 2007; 87: 305–311.
- 9) Blum G et al. Properties of Escherichia coli strains of serotype O 6. Infection 1995; 23: 234–236.
- 10) Sonnenborn U, Schulze J. The non-pathogenic Escherichia coli strain Nissle 1917 – features of a versatile probiotic. Microbial Ecol Health Dis 2009; 21: 122–158.
- 11) Schiemann M et al. 125 Jahre E. coli – Bedeutung in Forschung und Medizin. Alfred-Nissle-Gesellschaft (Hrsg.) Hagen, ISBN 3-9811198-4-3, 2010.
- 12) Troge A et al. More than a marine propeller – the flagellum of the probiotic Escherichia coli strain Nissle 1917 is the major adhesin mediating binding to human mucus. Int J Med Microbiol 2012; 302: 304–314.
- 13) Schlee M et al. Induction of human beta-defensin 2 by the probiotic Escherichia coli Nissle 1917 is mediated through flagellin. Infect Immun 2007; 75(5): 2399–2407.
- 14) Patzer S I et al. The colicin G, H and X determinants encode microcins M and H47, which might utilize the catecholate siderophore receptors FepA, Cir, Fiu and Iron. Microbiology 2003; 149: 2557–2570.
- 15) Oelschlaeger TA et al. Inhibition of Salmonella typhimurium invasion into intestinal cells by the probiotic E. coli strain Nissle 1917. Gastroenterology 2001; 120: A326.
- 16) Boudeau J et al. Inhibitory effect of probiotic Escherichia coli strain Nissle 1917 on adhesion to and invasion of intestinal epithelial cells by adherent-invasive E. coli strains isolated from patients with Crohn's disease. Aliment Pharmacol Ther 2003; 18: 45–56.
- 17) Altenhoefer A et al. The probiotic Escherichia coli strain Nissle 1917 interferes with invasion of human intestinal epithelial cells by different enteroinvasive bacterial pathogens. FEMS Immunol Med Microbiol 2004; 40: 223–229.
- 18) Leatham MP et al. Precolonized human commensal Escherichia coli strains serve as a barrier to E. coli O157:H7 growth in the streptomycin-treated mouse intestine. Infect Immun 2009; 77: 2876–2886.
- 19) Reissbrodt R et al. Inhibition of growth of Shiga toxin-producing Escherichia coli by nonpathogenic Escherichia coli. FEMS Microbiol Lett 2009; 290: 62–69.
- 20) Kleta S et al. Role of F1C fimbriae, flagella, and secreted bacterial components in the inhibitory effect of probiotic Escherichia coli Nissle 1917 on atypical enteropathogenic E. coli infection. Infect Immun 2014; 82(5): 1801–1812.
- 21) Hacker J, Heesemann J. Molekulare Infektionsbiologie: Interaktionen zwischen Mikroorganismen und Zellen. Berlin: Spektrum Akademischer Verlag, 2000.
- 22) Cichon C et al. DNA-Microarray-based comparison of cellular responses in polarized T84 epithelial cells triggered by probiotics: E. coli Nissle 1917 (EcN) and Lactobacillus acidophilus PZ1041. Gastroenterology 2004; 126(4): A-578.
- 23) Schultz M et al. Preventive effects of Escherichia coli strain Nissle 1917 on acute and chronic intestinal inflammation in two different murine models of colitis. Clin Diagn Lab Immunol 2004; 11(2): 372–378.
- 24) Wehkamp J et al. NF-kappaB- and AP-1-mediated induction of human beta defensin-2 in intestinal epithelial cells by Escherichia coli Nissle 1917: a novel effect of a probiotic bacterium. Infect Immun 2004; 72(10): 5750–5758.
- 25) Lata J et al. The effect of probiotics on gut flora, level of endotoxin and Child-Pugh score in cirrhotic patients: results of a double-blind randomized study. Eur J Gastroenterol Hepatol 2007; 19: 1111–1113.
- 26) Zyrek AA et al. Molecular mechanisms underlying the probiotic effects of Escherichia coli Nissle 1917 involve ZO-2 and PKCz redistribution resulting in tight junction and epithelial barrier repair. Cell Microbiol 2007; 9: 804–816.
- 27) Ukena SN et al. Probiotic Escherichia coli Nissle 1917 inhibits leaky gut by enhancing mucosal integrity. PLOS ONE 2007; 12: e1308; 1–9.
- 28) Rund SA et al. Antagonistic effects of probiotic Escherichia coli Nissle 1917 on EHEC strains of serotype O104:H4 and O157:H7. Int J Med Microbiol 2013; 303: 1–8.
- 29) Kruis W et al., A double-blind placebo-controlled trial to study therapeutic effects of probiotic Escherichia coli Nissle 1917 in subgroups of patients with irritable bowel syndrome. Int J Colorectal Dis 2012; 27(4): 467–474.
- 30) Bär F et al. Cell-free supernatants of Escherichia coli Nissle 1917 modulate human colonic motility: evidence from an in vitro organ bath study. Neurogastroenterol Motil 2009; 21: 559–e17.
- 31) Sonnenborn U et al. Antimutagenic activity of the probiotic E. coli strain Nissle 1917. J Crohns Colitis 2009; 3: S136.
- 32) Otte JM et al. Probiotics regulate the expression of COX-2 in intestinal epithelial cells. Nutr Cancer 2009; 61(1): 103–113.
- 33) Hockertz S. Immunmodulierende Wirkung von abgetöteten apathogenen Escherichia coli Stamm Nissle 1917, auf das Makrophagensystem. Arzneim-Forsch/Drug Res 1991;41:1108–1112.
- 34) Hockertz S. Steigerung der körpereigenen Abwehr gegen Bakterien- und Pilzinfektionen bei Mäusen nach Vorbehandlung mit dem apathogenen Escherichia coli-Stamm Nissle 1917. Arzneim.-Forsch./Drug Res. 1997;47(1)(6): 793–796.
- 35) Lodinová-Žádníková R et al. Local and serum antibody response in fullterm and premature infants after artificial colonization of the intestine with E. coli strain Nissle 1917 (Mutaflor). Pediatr Allergy Immunol 1992; 3: 43–48.
- 36) Lodinová-Žádníková R, Sonnenborn U. Effect of preventive administration of a nonpathogenic Escherichia coli strain on the colonization of the intestine with microbial pathogens in newborn infants. Biol Neonate 1997; 71: 224–232.

- 37) Cukrowska B et al. Specific proliferative and antibody responses of premature infants to intestinal colonization with nonpathogenic probiotic *E. coli* strain Nissle 1917. *Scand J Immunol* 2002; 55: 204–209.
- 38) Lodinová-Žádníková 1991, persönliche Mitteilung
- 39) Henker J et al. The probiotic *Escherichia coli* strain Nissle 1917 (EcN) stops acute diarrhoea in infants and toddlers. *Eur J Pediatr* 2007; 166(4): 311–318.
- 40) Henker J et al. Probiotic *Escherichia coli* Nissle 1917 versus placebo for treating diarrhea of greater than 4 days duration in infants and toddlers. *Pediatr Infect Dis J* 2008; 27(6): 494–499.
- 41) Möllenbrink M, Bruckschen E. Behandlung der chronischen Obstipation mit physiologischen *Escherichia coli*-Bakterien. *Med Klin* 1994; 89: 587–593.
- 42) Bruckschen E, Horosiewicz H. Chronische Obstipation, Vergleich von mikrobiologischer Therapie und Lactulose. *Münch Med Wochenschr* 1994;16:241–245.
- 43) Kruis W et al. Double-blind comparison of an oral *Escherichia coli* preparation and mesalazine in maintaining remission of ulcerative colitis. *Aliment Pharmacol Ther* 1997; 11: 853–858
- 44) Rembacken BJ et al. Non-pathogenic *Escherichia coli* versus mesalazine for the treatment of ulcerative colitis: a randomised trial. *Lancet* 1999; 354: 635–639.
- 45) Kruis W, et al. Maintaining remission of ulcerative colitis with the probiotic *Escherichia coli* Nissle 1917 is as effective as with standard mesalazine. *Gut* 2004; 53: 1617–1623.
- 46) Henker J et al. Probiotic *Escherichia coli* Nissle 1917 (EcN) for successful remission maintenance of ulcerative Colitis in children and adolescents: an open-label pilot study. *Z Gastroenterol* 2008; 46: 874–875.
- 47) Matthes H et al. Clinical trial: probiotic treatment of acute distal ulcerative colitis with rectally administered *Escherichia coli* Nissle 1917 (EcN). *BMC Complement Altern Med* 2010;10:13.
- 48) Travis SPL et al. European evidence-based Consensus on the management of ulcerative colitis: Current management. *Journal of Crohn's and Colitis* 2008; 2(1): 24–62.
- 49) Malchow HA. Crohn's Disease and *E. coli*. *J Clin Gastroenterol* 1997; 25: 653–658
- 50) Keller J et al. Reizdarm-Patienten mit Meteorismus als dominantem Symptom profitieren von einer Therapie mit *E. coli* Nissle 1917 – Ergebnisse einer Pilotstudie. *Z Gastroenterol* 2010; 48: 955.
- 51) Layer P. S3-Leitlinie Reizdarmsyndrom: Definition, Pathophysiologie, Diagnostik und Therapie. *Z Gastroenterol* 2011; 49: 237–293.
- 52) Krammer H et al. Probiotische Arzneimitteltherapie mit *E. coli* Stamm Nissle 1917 (EcN): Ergebnisse einer prospektiven Datenerhebung mit 3807 Patienten. *Z Gastroenterol* 2006; 44: 651–656.
- 53) Plassmann D, Schulte-Witte H. Treatment of irritable bowel syndrome with *Escherichia coli* strain Nissle 1917 (EcN): a retrospective survey. *Med Klin (Munich)* 2007; 102(11): 888–892.
- 54) Goerg KJ, Schlörner E. Probiotic therapy of pseudomembranous colitis. Combination of intestinal lavage and oral administration of *Escherichia coli*. *Dtsch Med Wochenschr* 1998;123(43):1274–1278.
- 55) Goerg KJ et al. A new approach in pseudomembranous colitis: probiotic *Escherichia coli* Nissle 1917 after intestinal lavage. *Eur J Gastroenterol Hepatol* 2008; 20(2): 155–156.
- 56) Kuzela L et al. Induction and maintenance of remission with nonpathogenic *Escherichia coli* in patients with pouchitis. *Am J Gastroenterol* 2001; 96: 3218–3219.
- 57) Tromm A et al. The probiotic *E. coli* strain Nissle 1917 for the treatment of collagenous colitis: First results of an open-labelled trial. *Z Gastroenterol* 2004; 365–369.
- 58) Fric P et al. The effect of non-pathogenic *Escherichia coli* in symptomatic uncomplicated diverticular disease of the colon. *Eur J Gastroenterol Hepatol* 2003, 15; 313–315.
- 59) Henker J et al. Successful treatment of gut-caused halitosis with a suspension of living non-pathogenic *Escherichia coli* bacteria—a case report. *Eur J Pediatr* 2001; 160: 592–594.
- 60) Wurzel R. Prophylaxe der polymorphen Lichtdermatose. *Akt Dermatol* 1999; 25: 329–333.
- 61) Grozdanov L et al. A single nucleotide exchange in the *wzy* gene is responsible for the semirough O6 lipopolysaccharide phenotype and serum sensitivity of *Escherichia coli* strain Nissle 1917. *J Bacteriol* 2002; 184: 5912–5925.
- 62) Grozdanov L et al. Analysis of the Genome Structure of the Nonpathogenic Probiotic *Escherichia coli* Strain Nissle 1917. *J Bacteriol*. 2004; 186: 5432–5441.
- 63) Blum-Oehler G et al. Development of strain-specific PCR reactions for the detection of the probiotic *Escherichia coli* strain Nissle 1917 in fecal samples. *Res Microbiol* 2003; 154: 59–66.
- 64) Reister M et al. Complete genome sequence of the Gram-negative probiotic *Escherichia coli* strain Nissle 1917. *J Biotechnol* 2014;187: 106–107.

Further reading:

In addition to the sources mentioned, there are numerous publications, especially with reference to preclinical trials.

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