

Bakterielle Stress-Varianten, Persister, Eberth-Koch'sche Varianten, bakterielle L-Formen, filtrierbare Bakterien http://en.wikipedia.org/wiki/L-form_bacteria, langsam wachsende Bakterienpopulationen, Bakterielle Yin-Yang Varianten nach Zhang, einschl. Nanobakterien / Nanoben

Bacterial stress variants, Persisters, Eberth, Koch variants, bacterial L-forms, filterable microbes http://en.wikipedia.org/wiki/L-form_bacteria, slow bacterial infections, bacterial Yin-Yang variants according to Zhang, including nanobacteria / nanobes

L-Formen = **Sonderformen der bakteriellen Pleomorphie.** <http://www.erlebnishaft.de/stressvar2.pdf>

„Since many bacteria in the classical form pass through 450 Nanometer pore filters, the term „**filterable microbes**“ should be reserved for **variants which pass through a porosity of 250 Nanometer or less**. Most CWD (cell wall defective) forms include filterable, viable units, but this is not invariable, depending on the age of the culture and nutrients supplied.” In **Mattman L. (2001)** Cell Wall Deficient Forms. Stealth Pathogens. CRC Press 3rd Edition, p.11

"Da viele Bakterien in ihrer klassischen Form 450 Nanometer Poren Filter passieren, sollte der Begriff "**filtrierbare Mikroben**" für **Varianten reserviert werden, die eine Porosität von 250 Nanometer oder weniger passieren**. Die meisten CWD (Zellwand defekte) Formen sind filtrierbar, lebensfähige Einheiten, aber dies ist nicht immer gleich, es hängt ab vom Alter der Kultur und den verfügbaren Nährstoffen." In **Mattman L. (2001)** Cell Wall Deficient Forms. Stealth Pathogens. CRC Press 3rd Edition, p.11
Stress-Granula, SG (2019) https://en.wikipedia.org/wiki/Stress_granule

- ➔ Lebensstrukturenvergleich <http://www.xerlebnishaft.de/lebensstrukturenvergleich.pdf>
- ➔ Selbstorganisation, Symbiose http://www.erlebnishaft.de/selbst_muster_nano.pdf
- ➔ Pereira C (2016) Is it quantum sentience or quantum consciousness? NeuroQuantology 14(1) 16-27, doi: 10.14704/nq.2016.14.1.874 https://www.researchgate.net/publication/299445549_Is_it_Quantum_Sentience_or_Quantum_Consciousness_A_Review_of_Social_Behaviours_Observed_in_Primitive_and_Present-Day_Microorganisms
« **The intent of this review is to prove the origin and existence of consciousness or sentient awareness in microorganisms based on which these social behaviours originated and its comparison to multifaceted conscious behaviours observed in higher beings; its correlation to quantum generated consciousness which enables organisms to understand and judge perceptions, which gives the organism a prospect to behave as per will.** »

- ➔ Borrelien – Populations – Dynamik <http://www.erlebnishaft.de/stressvar2.pdf>
- ➔ Warum Borrelien infektiös bleiben trotz intensiver antibiotischer Behandlung <http://www.xerlebnishaft.de/escape.pdf> Why Borrelia remain infectious despite intensive antibiotic treatment http://www.xerlebnishaft.de/escape_eng.pdf
- ➔ Inflammation, Lymphom, Neoplasma http://www.xerlebnishaft.de/borrel_inflam_lymphom_neopl.pdf
- ➔ Zytoskelett, Tight junctions <http://www.xerlebnishaft.de/zytoskelett.pdf>
- ➔ Krebsstammzell- und Bakterien Persister-Therapie <http://www.xerlebnishaft.de/krebsstammzelltherapie.pdf>

Obligat intrazelluläre Krankheitserreger	Facultativ intrazelluläre Krankheitserreger
Chlamydia spp, Coxiella burnetii, Ehrlichia spp, Erwinia spp, Rickettsia spp, Parachlamydia spp Mycobakterium leprae, Tropheryma Whipelei, Waddlia etc.	Borrelia spp, Treponemen, Leptospiren, Bartonellen, Mycoplasmen, Brucella spp, Legionella spp, Listeria spp, Mycobacterium spp, Neisseria spp, Salmonella spp, Shigella spp, Yersinia spp, Babesia spp, Toxoplasma, Protomyxzoa spp, Trypanosomes, Streptokokken spp, Candida etc.

http://de.wikibooks.org/wiki/Medizinische_Mikrobiologie:_Atypische_Bakterien

Gen Dynamik http://www.xerlebnishaft.de/gen_dynamik.pdf

Cell wall defective forms, stress variants, bacterial persisters, L-Forms

Löhnis F (1916), Almquist E (1922), Relman DA (1999), Wainwright M (1999), Klineberger E (1931, 1947, 3x1949, 2x1951, 1960), Kendall AI (1931), Dienes (1947, 1951), Fleming (1950), Delamater ED (1951), Vigoroux (1956), Hanoun C (4x1957), Pratt 1966), Charache (1968, 1970), Mattman LH (1968, 2001, 2009), McDermott D (1969), Feingold DS (1969), Buttler HM (1975), Domingue GJ (, 1995, 1997, 2010), Gumpert J (1998), Kajander EO (1996, 1997, 1998), Ciftcioglu N (1998), Urwins P (1998), Young D (2002), Monack DM (2004), Onwuamaegbu ME (2005), Lewis K (2005, 2007, 2010, 2016), Margulis 2009), Dworkin J (2010), Dawson CC (2011), Errington J (2013), Germain E (2013), Wood TK (2013), Zang Y (2014), Wang G (2014), Meriläinen L (2015, 2016), Sharma B (2015), Robert A (2017), Wörmer (2019)

Mycobacteria

Fontes A (1910), Calmette A (1926), Luksch F (1931), Bernstein (1933), Bassermann FJ (1955), Mattman LH (1960), Korsak T (1975), Tekahashi S (1079), Judge MS (1982), Golyshevskaya VL (1984), Zemskova ZS (1985), Berezowsky BA (1988), Biron MG (1989), Zang DR (1993), Dorozhkova IR (1995), Wakamoto Y (2013)

Spirochäten

Warthin AS (1930), DeLamater ED (3x1950, 1951), Preac Mursic V (1989, 1996), MacDonald AB (1990, 2x2006, 2x2013), Burk DK (1995), Brorson O (1995, 1997, 1998, 1999), Kerstin A (1995), Aberer E (1996, 1997), Domingue GJ (1997), Wainwright M (1997), Gruntar I (2001, 2003), Murgia, R (2002, 2004), Kroun M (2007), Miclossy J (2008), Kraiczi P (2011, 2013), Barbour A (2012, 2015), Lemgruber L (2012), Lantos PM (2013), Berntson K (2013) Berghoff W (2014), Huismans BD (2014), Wallich R (2015), Feng J (2015), Caskey JR (2015), Scharma B (2015), Sharma B (2015), Feng J (2015), Meriläinen L (2015, 2016), Hyde JA (2017)

Brucellen

Hatten BA (1966)

Mycoplasmen

Razin S (1998)

Staphylococcus aureus

Trofimova ND (1959), Fuller E (2005)

Streptokokken

Cook J (1969), Green MT (1974), Rollin G (2017)

Nocardien

Beaman BL (1980, 1981)

Echeria coli

Joseleau-Petit D (2007)

Salmonellen

Nix RN (2007), Claudi B (2014), Helaine S (2014)

Listerien

Brem MA (, 1968), Prosorowsky S (1976), Benson CA (1983), Dell'Éra S (2009)

Bacillus subtilis

Gilpin RW (1973)Allan EJ (1991), Leaver M (2009)

Proteus mirabilis

Rippmann JF (1998)

Fungi

Tunstall LH (1961), Rosner R (1966), Swieczkowski DM ()

Chlostridium botulinum

Brown GW (1970)

Bakterioplankton

Yawata Y (2014)

Allgemein

Davaine (1864) Bacteridien. Compt. rend. LIX 429 LX 1296 Arch. Général p.498

Cohn F (1872) Über Bacterien, die kleinsten lebenden Wesen. Sammlung gemeinverständlicher wissenschaftlicher Vorträge, herausgegeben von Rud. Virchow und Fr.v. Holzendorff. VII. Serie. Heft 165. Berlin, C.B. Lüderzschsche Verlagsb. Carl Habel.

Eberth CJ (1880) Die Organismen in den Organen bei Typhus abdominalis. Arch. f. path.Anat. 81 („**Eberth-Koch'sche Varianten**“)

Russell W (1890) An address on a characteristic organism of cancer. Br Med J. 2,1356-1360

Russell W (1899) The parasite of cancer. Lancet. 1,1138-1141.

Béchamp A (1911) The Blood and its Third Element. Reprint 2002 Metropolis INK ISBN 0-9579858-7-8

Löhnis F (1916) Life cycles of bacteria. J. Agric. Res. 6, 675-702.

Enderlein G (1916) Bakterien-Cyclogenie. Nachdruck 1981, Semmelweis-Institut Hoya

Young J (1921) Description of an organism obtained from carcinomatous growths. Edinburgh Med J. 27, 212-221.

Almquist E (1922) Variation and life cycles of pathogenic bacteria. J.Infect.Dis. 31, 483-493

Scott MJ (1925) The parasitic origin of carcinoma. Northwest Med. 24:162-166

Hess D. (1997) Can Bacteria Cause Cancer? New York University Press. New York, USA

Relman DA (1999) The search for unrecognized pathogens. Science 284, 1308-1310

Wainwright M (1999) Nanobacteria and associated elementary bodies in human disease and cancer. Microbiology 145, 2623-2624

Klieneberger E (1931) Die heutigen Auffassungen der verschiedenen Formen der Bakterienzellen einer Art. Klinische Wochenschrift. 10, 31ff

<http://link.springer.com/article/10.1007%2FBF01749944#page-1>

Kendall AI. (1931) OBSERVATIONS UPON THE FILTERABILITY OF BACTERIA, INCLUDING A FILTERABLE ORGANISM OBTAINED FROM CASES OF INFLUENZA. Science.74(1910),129-39.

<http://www.ncbi.nlm.nih.gov/pubmed/17782489>

“1. The isolation of a filter-passing diplococcus from the blood of certain cases of influenza by means of a special cultural medium is described. The experimental effects of this organism, while in the filterable state, upon rabbits, is discussed. 2. A procedure is formulated for inducing at will both a filterable and a

non-filterable state in bacteria. Mention is made of a series of experiments in which both the filterable and the non-filterable state has thus been induced in a series of well-known bacteria comprising a variety of types. 3. It is postulated that a majority, if not all, known bacteria can and do exist in a filterable and in a non-filterable state. 4. A preliminary report of the isolation of microbes in the blood, not only of cases of influenza, but also from common cold, rheumatic fever, arthritis, from Staphylococcus bacteriophage and Besredka's Staphylococcus Antivirus is presented in evidence of the ubiquity of the procedure. 5. An explanation of the chemical basis for the existence of bacteria, both in the filterable and non-filterable states, in the animal and human body, and in culture, is proffered. 6. The relation of this chemical concept to microbic infection, and the state of microbes in the body during infection is discussed."

Hobby GL, Meyer K, Chaffee E. (1942) Observations on the mechanism of action of penicillin. Proc Soc Exp Biol NY 50, 281–285. [Article http://ebm.sagepub.com/content/50/2/281](http://ebm.sagepub.com/content/50/2/281)

GORDON J, GORDON M (1943) Involution forms of the genus Vibrio produced by glycine. J. Path. Bact. 55, 63.

Bigger JW. (1944) Treatment of staphylococci infections with penicillin by intermittent sterilization. Lancet 244, 497-500 <https://www.researchgate.net/publication/245591240>

KLIENEBERGER-NOBEL E (1947) Morphological appearances of various stages in B. proteus and coli. J. Hyg., Camb., 45, 410.

Dienes, L (1947). Further observations on the reproduction of bacilli from large bodies in Proteus cultures. Proc Soc Exp Biol Med, 66, 97-98.

KLIENEBERGER-NOBEL L (1949 a) Origin, development and significance of L-forms in bacterial cultures. J. gen. Microbiol. 3, 434.

KLIENEBERGER-NOBEL L (1949 b) On Streptobacillus moniliformis and the filtrability of its L-form. J. Hyg., Camb., 47, 393.

Klieneberger-Nobel E (1949) Origin, development and significance of **L forms** in bacterial cultures. J. Gen. Mikrobiol. 3, 434-442

FLEMING A, VOUREKA A, KRAMER IRH, HUGHES WH (1950) The morphology and motility of Proteus vulgaris and other organisms cultured in the presence of penicillin. J. gen. Microbiol. 4, 257.

DELAMATER ED, HAANESM H, WIGGALL RH, PILLSBURY DM (1951) STUDIES ON THE **LIFE CYCLE OF SPIROCHETES**. VIII. SUMMARY AND COMPARISON OF OBSERVATIONS ON VARIOUS ORGANISMS. THE JOURNAL OF INVESTIGATIVE DERMATOLOGY 16, 231-56 <http://lymerick.net/1951-Delamater.htm>

Klieneberger-Nobel E (1951) The L-cycle: a Process of Regeneration in Bacteria. Journal of general microbiology, 5(3), 525-30. https://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=2ahUKEwlnLCK2fLgAhWE2KQKHbjbA5cQFjAAeqQICRAB&url=http%3A%2F%2Fmic.microbiologyresearch.org%2Fcontent%2Fjournal%2Fmicro%2F10.1099%2F00221287-5-3-525%3Fcrawler%3Dtrue%26mimetype%3Dapplication%2Fpdf&usq=AOvVaw2UlxRPQwh_M8ShJKwiOR-B

Klieneberger-Nobel E (1951). [Filterable forms of bacteria](#). Bacteriol Rev, 15(2), 77-103.

Dienes L, Weinberger HJ (1951) The **L forms** of bacteria. Bacteriol. Rev. 15, 245-283.

Vigouroux J, Hannoun C (1956) [Spontaneous appearance in vivo of L forms of bacteria; their possible importance in infectious pathology](#) Comptes rendus hebdomadaires des séances de l'Académie des sciences. 242(21), 2603-2606.

Hannoun C, Vigouroux J (1957) [Study of L forms of bacteria appearing spontaneously in vivo. I. Biological properties and pathogenic power](#) Annales de l'Institut Pasteur. 91(6), 912-927.

Hannoun C, Vigouroux J (1957) [Study of L forms of bacteria appearing spontaneously in vivo. II. Peculiar character of granular elements](#) Annales de l'Institut Pasteur. 92(1), 112-122.

Hannoun C, Vigouroux J, Levaditi J, Nazimoff O (1957) [L forms of bacteria appearing spontaneously in vivo. III. Comparative histopathology of lesions induced by normal bacteria and their modified forms](#). Annales de l'Institut Pasteur. 92(2), 231-8.

Hannoun C, Vigouroux J, Schneider J (1957) [Isolation of granular forms of bacteria in two cases of malignant endocarditis with negative or becoming negative hemoculture.](#) La Presse medicale 65(72), 1608-1611

Klieneberger-Nobel E (1960) **L Forms** of bacteria. Bacteriol.Rev.Vol.1: Structure,Gunsalus,I.C.and Stanier R.Y. Eds., Academic Press, NY 361

Diller IC Diller WF (1965) **Intracellular acid-fast organisms isolated from malignant tissues.** Trans Amer Micr Soc. 84,138-148

Pratt B (1966) Cell-wall deficiencies in **L-forms** of Staphylococcus aureus. J Gen Microbiol, 42,115-22

Ovcinnikov NM, Delektorskij VV (1966) **Morphology of Treponema pallidum.** Bull. Org. mond. Sante 35, 223-229 Bull. Wid Hlth Org.J

Charache P (1968) **Atypical bacterial forms** in human disease, in Microbial **Protoplasts, Spheroplasts, and L-Forms**, Guze LB, Ed., Williams & Wilkins, Baltimore, 484-494

Mattman LH (1968) **L forms isolated from infections.** In Microbiol Protoplasts, Spheroplasts and L-Forms. Guze LB, Ed., Williams & Wilkins, Baltimore, 472-483

Warren SL, Marmor L, Liebes DM, Hollins RL (1969) **Congenital transmission in mice of an active agent from human rheumatoid arthritis.** Nature. 223(5206), 646-7 PMID: 5799548

McDermott W (1969) **Microbial persistence.** Harvey Lectures 63, 1-31

[Feingold DS](#) (1969) **Biology and pathogenicity** of microbial spheroplasts and I-forms. N Engl J Med. 281(21), 1159-70. <http://www.ncbi.nlm.nih.gov/pubmed/4899869>

Charache P (1970) **Cell wall defective bacterial variants in human disease.** Ann. N.Y. Acad. Sci. 174, 903-911.

Hölzl Wallach DF, Fischer H ed. (1971) **The Dynamic Structure of Cell Membranes.** 22. Colloquium der Gesellschaft für biologische Chemie 15.-17. April 1971 in Mosbach / Baden. Springer-Verlag Berlin Heidelberg New York. <http://www.springer.com/de/book/9783642653063>

Wuerthele-Caspe Livingston V, Livingston AM (1972) Demonstration of **Progenitor cryptocides** in the blood of **patients with collagen and neoplastic diseases.** Trans NY Acad Sci. 174 (2), 636-654.

Butler HM, Blakey JL (1975) [A review of bacteria in L-phase and their possible clinical significance.](#) The Medi. J. of Australia, 2(12), 463-7.

Domingue GJ (ed.) **Cell Wall Deficient Bacteria: Basic Principles and Clinical Significance.** Addison Wesley Publishing Co., Reading, PA, USA

Cantwell A (1982) **Variably acid-fast cell wall-deficient bacteria as a possible cause of dermatologic disease.** In : Cell Wall Deficient Bacteria : Basic Principles and Clinical Significance.Domingue GJ (2d.) pp. 321-360 Addison Weley Publishing Co., reading PA, USA <http://www.discoverymedicine.com/Gerald-J-Domingue/2010/09/23/demystifying-pleomorphic-forms-in-persistence-and-expression-of-disease-are-they-bacteria-and-is-peptidoglycan-the-solution/>

Enby EOH (1984) **Mikroben ähnliche Bildungen im Blut bei chronischen Krankheiten.** [Microbe-like formations in the blood of patients with chronic diseases](#) <http://www.enby.se/deutsch/aufsatz/2/mikrobenahnliche-bildungen-im-blut-bei-chronischen-krankheiten.htm>

Cantwell Jr A (1990) **The Cancer Microbe**. The hidden killer in Cancer, AIDS, and other Diseases. Aries Rising Press Los Angeles.

Eng RH, Padberg FT, Smith SM, Tan EN, Cherubin CE (1991) **Bactericidal effects of antibiotics on slowly growing and nongrowing bacteria**. *Antimicrob Agents Chemother.* 35(9), 1824–1828. PMID: PMC245275 <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC245275/>

Franzmann PD, Dobson SJ (1992) **Cell wall-less, free-living spirochetes in Antarctica**. *FEMS Microbiology Letters.* 97(3), 289–292 DOI: 10.1111/j.1574-6968.1992.tb05477.x <http://onlinelibrary.wiley.com/doi/10.1111/j.1574-6968.1992.tb05477.x/abstract;jsessionid=6E679E618DFA5D54521635EBED6E24C2.d01t03>

Rook GAW, Lydyard PM, Stanford JL (1993) **A reappraisal of the evidence that rheumatoid arthritis and several other idiopathic diseases are slow bacterial infections**. *Annals of the Rheumatic Diseases* 52, 30-38 http://ard.bmj.com/content/52/Suppl_1/S30.full.pdf

Margulis LJ, Ashen B, Sole M, Guerrero R (1993) **Composite, large spirochetes from microbial mats: spirochete structure review**. *Proc Natl Acad Sci USA* 90, 6966–6970.

Wall S, Kunze ZM, Saboor S, Soufleri I, Seechurn P, Chiodini R, McFadden JJ (1993). [Identification of spheroplast-like agents isolated from tissues of patients with Crohn's disease and control tissues by polymerase chain reaction](#). *J Clin Microbiol* 31 (5), 1241–5. [PMC 262911](#). [PMID 8501224](#).

Enby EOH, Chouhan RS (1994) **Microorganisms in blood and tumor tissue from patients with malignancies of breast or genital tract. Atypical microbes in blood and cancer tissue**. <http://www.enby.se/english/paper/6/microorganisms-in-blood-and-tumour-tissue-from-patients.htm#video>

Domingue GJ (1995) Electron dense cytoplasmatic particles and chronic infection: a bacterial pleomorphism hypothesis. *Endocytobiosis Cell Res* 11, 19-40

Kajander EO, Kuronen I, Ciftcioglu N (1996) Fatal (fetal) bovine serum: discovery of **Nanobacteria**. *Mol. Biol. Cell, Suppl.*, Vol. 7, 517a <http://www.uku.fi/~kajander/> <http://www.uku.fi/~kajander/fatal.html>

Kajander EO, Kuronen I, Akerman KK, Pelttari A, Ciftcioglu N (1997) Fine nanobacteria from blood: The smallest culturable autonomously replicating agent on Earth. In: Hoover RB, editor. *Proc SPIE; Conference 3111: Instruments, methods, and missions for the investigation of extraterrestrial microorganisms*; 29 July–1 August 1997; San Diego, California. 420–428. In: [[Google Scholar](#)]

Domingue GJ, Woody H (1997) [Bacterial persistence and expression of disease](#). *Clin. Microbiol. Rev.*, 10(2), 320-344. [Full PDF](#)

Gumpert J, Hoischen C (1998) **Use of cell wall-less bacteria (L-forms) for efficient expression and secretion of heterologous gene products**. *Current Opinion in Biotechnology* 9 (5), 506–9. [doi:10.1016/S0958-1669\(98\)80037-2](https://doi.org/10.1016/S0958-1669(98)80037-2). [PMID 9821280](#).

Kajander EO, Ciftcioglu N. (1998) **Nanobacteria**: an alternative mechanism for pathogenic intra- and extracellular calcification and stone formation. *Proc. Nat. Acad. Sci.* 95, 8274-8279. [Full text](#)

Ciftcioglu N, Kajander EO (1998) **Interaction of nanobacteria with cultured mammalian cells**. *Pathophysiology* 4, 259–270. [View Article](#) [PubMed/NCBI](#) [Google Scholar](#)

Uwins P et al. (1998). [Novel nano-organisms from Australian sandstones, American Mineralogist.](#) 83, 1541–1550. <http://www.microscopy-uk.org.uk/nanobes/nanopaper.html>. <http://www.answers.com/topic/nanobe#ixzz3Bm2euLKY>

[Lynn Margulis](#) (1998, 1999) **Die andere Evolution**. Spektrum Verlag. Oder: Microcosmos. Four billion Years of Microbial Evolution. University of California Press.

[Gao LY](#), [Susa M](#), [Ticac B](#), [Abu Kwaik Y](#). (1999) **Heterogeneity in intracellular replication and cytopathogenicity of Legionella pneumophila and Legionella micdadei in mammalian and protozoan cells**. *Microb Pathog.* 27(5) 273-87 <http://www.ncbi.nlm.nih.gov/pubmed/10545255>

Cisar, JO, Xu D-Q, Thompson J, et al. (2000) An alternative interpretation of **nanobacteria**-induced biomineralization. Proc. Nat. Acad. Sci. 97, 11,511-11,515. [Full text of the article](#)

Saradjian P (2001) **Evidence supportive and unsupportive of nanobacteria**. Annual Curr. Lit. in Bio. Review. 1, 1-16

“... three centuries ago, Anton van Leeuwenhoek discovered “animalcules” and encountered heavy resistance when he challenged the popular concept of spontaneous generation (26). Whatever the outcome from the debate over nanobacteria, “Nano will be the most important word in this century” – Bernt-Dieter Huisman, German Physician.”

Vali H, McKee MD, Ciftioglu N et al. (2001) **Nanoforms**: A new type of protein-associated mineralization. Geochimica et Cosmochimica Acta, Vol. 65, No. 1, pp. 63–74
<https://web.stanford.edu/group/Zarelab/publinks/zarepub638.pdf>

Mattman LH (2001). [Cell Wall Deficient Forms: Stealth Pathogens](#). CRC Press.
<http://www.youtube.com/watch?v=WozrCFW0mRM>

Woo PC, Wong SS, Lum PN, Hui WT, Yuen KY (2001) **Cell-wall-deficient bacteria and culture-negative febrile episodes in bone-marrow-transplant recipients**. Lancet 357 (9257), 675–9.
[doi:10.1016/S0140-6736\(00\)04131-3](https://doi.org/10.1016/S0140-6736(00)04131-3). PMID 11247551.

[Barr SC](#), [Linke RA](#), [Janssen D](#), [Guard CL](#), [Smith MC](#), [Daugherty CS](#), [Scarlett JM](#). (2003) Detection of biofilm formation and **nanobacteria** under long-term cell culture conditions in serum samples of cattle, goats, cats, and dogs. *Am J Vet Res.* 64(2), 176-82. <http://www.ncbi.nlm.nih.gov/pubmed/12602586>

Young D, Hussell T, Dougan G. (2002) Chronic bacterial infections: living with unwanted guests. *Nat Immunol.* 3(11), 1026-32.

Cisar JO, Xu D-Q, Thompson J et al. (2000) An alternative interpretation of nanobacteria-induced biomineralization. Proc. Nat. Acad. Sci. 97, 11,511-11,515. [Full text of the article](#)

Miller VM et al. (2004) Evidence of Nanobacterial-like Structures in Human Calcified Arteries and Cardiac Valves. In: [American Journal of Physiology-Heart and Circulatory Physiology](#). 287, H1115-H1124, [doi:10.1152/ajpheart.00075.2004](https://doi.org/10.1152/ajpheart.00075.2004)

Keren I, Kaldalu N, Spoering A et al (2004) Persister cells and tolerance to antimicrobials. FEMS Microbiol Lett. 230, 13-18 <http://www.ncbi.nlm.nih.gov/pubmed/14734160>

Monack DM, Mueller A, Falkow S (2004) **Persistent bacterial infections: the interface of the pathogen and the host immune system**. Nat. Rev. Microbiol. 2, 747–765

Onwuamaegbu ME, Belcher RA, Soare C. (2005) **Cell Wall-deficient Bacteria as a Cause of Infections: a Review of the Clinical Significance**. The Journal of International Medical Research. 33,1-20 <http://www.ncbi.nlm.nih.gov/pubmed/15651712>

Lewis K (2005) **Persister cells and the riddle of biofilm survival**. *Biochemistry (Mosc)*. 70(2), 267-74. <http://www.ncbi.nlm.nih.gov/pubmed/15807669>

Urbano P, Urbano F (2007) **Nanobacteria: Facts or Fancies?** PLOS Pathogens.
DOI: 10.1371/journal.ppat.0030055 <http://www.plospathogens.org/article/info:doi/10.1371/journal.ppat.0030055>

Lewis K (2007) **Persister cells, dormancy and infectious disease**. Nature Publishing Group 5, 48-56 <http://www.northeastern.edu/adc/publications/KL2007Pers.pdf>

Casadesús J (2007) **Bacterial L-forms require peptidoglycan synthesis for cell division**. BioEssays 29 (12), 1189–91. [doi:10.1002/bies.20680](https://doi.org/10.1002/bies.20680). PMID 18008373.

Martel J et al. (2008) Purported **nanobacteria** in human blood as calcium carbonate nanoparticles.” Proceedings of the National Academy of Sciences. 105(14), 5549-5554.
<http://phys.org/news128167633.html#iCp>

Glower WA, Yang Y, Zhang Y. (2009) Insights into the Molecular Basis of **L-Form** Formation and Survival in **Escheria coli**. PLoS online 10(4) 1-11

Zielinski, FU, A. Pernthaler, S. Duperron, L. Raggi, O. Giere, C. Borowski, and N. Dubilier. (2009). Widespread Occurrence of an **Intranuclear Bacterial Parasite** in Vent and Seep Mussels. Environ Microbiol. 11(5):1150-67. ► [Abstract \(PUBMED\)](#)
<http://onlinelibrary.wiley.com/doi/10.1111/j.1462-2920.2008.01847.x/full>

« **Summary: Many parasitic bacteria live in the cytoplasm of multicellular animals, but only a few are known to regularly invade their nuclei. In this study, we describe the novel bacterial parasite “*Candidatus Endonucleobacter bathymodioli*” that invades the nuclei of deep-sea bathymodiolin mussels from hydrothermal vents and cold seeps. ... We first discovered the intranuclear parasite “*Ca. E. bathymodioli*” in *Bathymodiolus puteoserpentis* from the Logatchev hydrothermal vent field on the Mid-Atlantic Ridge. Using primers and probes specific to “*Ca. E. bathymodioli*” we found this intranuclear parasite in at least six other bathymodiolin species from vents and seeps around the world. Fluorescence *in situ* hybridization and transmission electron microscopy analyses of the developmental cycle of “*Ca. E. bathymodioli*” showed that the infection of a nucleus begins with a single rod-shaped bacterium which grows to an unseptated filament of up to 20 µm length and then divides repeatedly until the nucleus is filled with up to **80 000 bacteria**. The greatly swollen nucleus destroys its host cell and the bacteria are released after the nuclear membrane bursts. Intriguingly, the only nuclei that were never infected by “*Ca. E. bathymodioli*” were those of the gill bacteriocytes. These cells contain the symbiotic sulfur- and methane-oxidizing bacteria, suggesting that the mussel symbionts can protect their host nuclei against the parasite. Phylogenetic analyses showed that the “*Ca. E. bathymodioli*” belongs to a monophyletic clade of *Gammaproteobacteria* associated with marine metazoans as diverse as sponges, corals, bivalves, gastropods, echinoderms, ascidians and fish. We hypothesize that many of the sequences from this clade originated from intranuclear bacteria, and that these are widespread in marine invertebrates“.**

Männik J, Driessen R, Galajda P, Keymer JE, Dekker C (2009). [Bacterial growth and motility in sub-micron constrictions](#). PNAS 106 (35), 14861–14866. doi:10.1073/pnas.0907542106.

Mattman LH (2009). **Cell Wall Deficient Forms: Stealth Pathogens**. CRC Press. ISBN-10: 0849335787 ISBN-13: 978-0849335785 <http://www.amazon.ca/Cell-Wall-Deficient-Forms-Pathogens/dp/0849335787>

Margulis L, Maniotis A, MacAllister J et al. (2009) **Position paper. Spirochete round bodies Syphilis, Lyme disease & AIDS: Resurgence of „the great imitator“?** SYMBIOSIS 47, 51-58

Lewis K (2010) Persister Cells. Annu Rev Microbiol . 64, 357-372. [PDF]
<http://www.ncbi.nlm.nih.gov/pubmed/20528688>

Mulcahy LR, Burns JL, Lory S, Lewis K (2010) Emergence of *Pseudomonas aeruginosa* strains producing high levels of persister cells in patients with cystic fibrosis. J. Bacteriol. 192(23), 6191-99. [PDF]

Dörr T, Vulic M, Lewis K (2010) Ciprofloxacin causes persister formation by inducing the TisB toxin in *Escherichia coli*. PloS Biology 8(2), e1000317. [PDF]

LaFleur MD, Qi Q, Lewis K (2010) Patients with long-term oral carriage harbor high-persister mutants of *C. albicans*. Antimicrob. Agents Chemother. 54(1), 39-44. [PDF]

Dworkin J, Shah IM (2010) **Exit from dormancy in microbial Organisms**. Macmillan Publishers Limited 8, 890-896 www.nature.com/reviews/microLi

Domingue GJ (2010) **Demystifying Pleomorphic Forms in Persistence and Expression of Disease: Are They Bacteria, and Is Peptidoglycan the Solution?** Discov Med 10(52), 234-246
<http://www.discoverymedicine.com/Gerald-J-Domingue/2010/09/23/demystifying-pleomorphic-forms-in-persistence-and-expression-of-disease-are-they-bacteria-and-is-peptidoglycan-the-solution/>

Markova N, Slavchev G, Michailova L, Jourdanova M (2010) Survival of *Escherichia coli* under **lethal heat stress** by L-form conversion. Int J Biol Sci 6(4), 303-315. doi:10.7150/ijbs.6.303
<http://www.ijbs.com/v06p0303.htm>
[Survival of Escherichia coli under lethal heat stress by L-form conversion.pdf](#)

[Microbe Magazine](#). (2011) Persister cells fingered in chronic CF. (Feature).

Dawson CC, Intapa C, Jabra-Rizk MA (2011) “**Persisters**”: **Survival at the Cellular Level**. PLoS Pathog 7(7), e1002121. doi:10.1371/journal.ppat.1002121
<http://www.plospathogens.org/article/info%3Adoi%2F10.1371%2Fjournal.ppat.1002121>

[Kim JS](#), [Heo P](#), [Yang TJ](#), [Lee KS](#), [Cho DH](#), [Kim BT](#), [Suh JH](#), [Lim HJ](#), [Shin D](#), [Kim SK](#), [Kweon DH](#) (2011) **Selective killing of bacterial persisters** by a single chemical compound without affecting normal antibiotic-sensitive cells. *Antimicrob Agents Chemother*. 55(11), 5380-3. doi: 10.1128/AAC.00708-11. Epub 2011 Aug 15. <http://aac.asm.org/content/55/11/5380.full>
„**Abstract: We show that 3-[4-(4-methoxyphenyl)piperazin-1-yl]piperidin-4-yl biphenyl-4-carboxylate (C10), screened out of a chemical library, selectively kills bacterial persisters that tolerate antibiotic treatment but does not affect normal antibiotic-sensitive cells. C10 led persisters to antibiotic-induced cell death by causing reversion of persisters to antibiotic-sensitive cells. This work is the first demonstration in which the eradication of bacterial persisters is based on single-chemical supplementation. The chemical should be versatile in elucidating the mechanism of persistence.**“

Abo-EL-Sooud K, Hashem MM, Ramadan A et al. (2011) **Research Strategies for Treatment of Nanobacteria**. *Insight Nanotechnology*, 1, 1-8 DOI: [10.5567/INANO-IK.2011.1.8](https://doi.org/10.5567/INANO-IK.2011.1.8)
<http://insightknowledge.co.uk/fulltext/?doi=INANO-IK.2011.1.8>

Allison KR, Brynildsen MP, Collins JJ (2011) Metabolite-enabled **eradication of bacterial persisters by aminoglycosides**. *Nature*. 473, 216-220 <http://www.ncbi.nlm.nih.gov/pubmed/21562562>

[Kutikhin AG](#), [Brusina EB](#), [Yuzhalin AE](#) (2012) **The role of calcifying nanoparticles in biology and medicine**. *Int J Nanomedicine*. 7, 339–350. doi: [10.2147/IJN.S28069](https://doi.org/10.2147/IJN.S28069) PMID: PMC3266001
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3266001/>

Y. Shibata et al. (2012) **Extrachromosomal MicroDNAs and Chromosomal Microdeletions in Normal Tissues**. *Science*, doi:1-1126/science.1213307.
<http://www.sciencemag.org/content/early/2012/03/07/science.1213307.abstract>

Bentmann E, Neumann M, Tahirovic S, Rodde R, Dormann D, Haass C (2012) Requirements for **stress granule** recruitment of Fused in **sarcoma** (FUS) and TAR DNA-binding protein of 43 kDa (TDP-43). *J Biol Chem*. 287(27), 23079-94

Bentmann E, Haass C, Dormann D (2013) **Stress granules** in neurodegeneration – lessons learnt from FUS and TDP-43. *FEBS J*. 280(18), 4348-70

[Das B](#), [Kashino SS](#), [Pulu I](#) et al. (2013) CD271+ bone marrow **mesenchymal stem cells** may provide **a niche for dormant Mycobacterium tuberculosis**. *Science Translational Medicine*, 5(170), 170ra13
<http://www.ncbi.nlm.nih.gov/pubmed/23363977>


Conlon BP, Nakayasu ES, Fleck LE, LaFleur MD, Isabella VM, Coleman K, Leonard SN, Smith RD, Adkins JN, Lewis K (2013) **Protease activation kills persisters and eradicates a chronic biofilm infection**. *Nature* 503, 365-370. <http://www.ncbi.nlm.nih.gov/pubmed/24226776>

[Helaine S](#), [Holden DW](#) (2013) **Heterogeneity of intracellular replication** of bacterial pathogens. *Current Opinion in Microbiology* 16,1 <http://www.sciencedirect.com/science/article/pii/S1369527413000039>

Errington J (2013) **L-form bacteria, cell walls and the origins of life**. *Open Biol* 3, 120143. doi: 10.1098/rsob.120143 <http://rsob.royalsocietypublishing.org/content/3/1/120143.full.pdf+html>

Mercier R et al. (2013) Excess membrane synthesis drives a primitive mode of cell proliferation. *Cell*, 152, 997-1007 <http://www.cell.com/retrieve/pii/S0092867413001359?cc=y>
“**We show that mutations leading to excess membrane synthesis are sufficient to drive L-form division in Bacillus subtilis. Artificially increasing the cell surface area to volume ratio in wild-type protoplasts generates similar shape changes and cell division. Our findings show that simple biophysical processes could have supported efficient cell proliferation during the evolution of early cells and provide an extant biological model for studying this problem.**“

Germain E et al. (2013) The molecular mechanism of bacterial persistence by **HipA**. *Molecular Cell*, 52, 248-54 <http://www.the-scientist.com/?articles.view/articleNo/38693/title/Bacterial-Persisters/>

Wood TK, Knabel SJ, Kwan BW (2013) **Bacterial Persister Cell Formation and Dormancy** Appl. Environ. Microbiol. 79, 7116-7121 [Abstract](#) [Full Text](#) [Full Text \(PDF\)](#) 

Kaiser P, Regoes RR, Dolowschiak T, Wotzka SY et al. (2014) **Cecum Lymph Node Dendritic Cells Harbor Slow-Growing Bacteria Phenotypically Tolerant to Antibiotic Treatment.** PLOS Biology DOI: 10.1371/journal.pbio.1001793
<http://www.plosbiology.org/article/info%3Adoi%2F10.1371%2Fjournal.pbio.1001793>

Zhang Y (2014) **Persisters, persistent infections and the Yin–Yang model.** Emerging Microbes & Infections 3, e3; doi:10.1038/emi.2014.3 Published online 8 January 2014
<http://www.nature.com/emi/journal/v3/n1/full/emi20143a.html>
<http://www.nature.com/emi/journal/v3/n1/pdf/emi20143a.pdf>

Wang G, Mayes MA, Gu L et al. (2014) **Representation of Dormant and Active Microbial Dynamics for Ecosystem Modeling.** PLOS <https://doi.org/10.1371/journal.pone.0089252>
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0089252>

Zhang S, Ye Ch, Lin H et al. (2015) **UV Disinfection Induces a Vbnc State in Escherichia coli and Pseudomonas aeruginosa.** Environ. Sci. Technol., Article ASAP DOI: 10.1021/es505211e
<http://pubs.acs.org/doi/abs/10.1021/es505211e>

Merilainen L, Herranen A, Schwarzbach A, Gilbert L. (2015) **Morphological and biochemical features of Borrelia burgdorferi pleomorphic forms.** Microbiology 161, 516-27.
<http://www.ncbi.nlm.nih.gov/pubmed/25564498>
http://www.microbiologyresearch.org/docserver/fulltext/micro/161/3/516_mic000027.pdf?expires=1455702503&id=id&accname=guest&checksum=EC90359881EEF900830727D16B2F8CBE

Sharma B, Brown AV, Matluck NE, Hu LT, Lewis K. (2015) **Borrelia burgdorferi, the causative agent of Lyme disease, forms drug-tolerant persister cells.** Antimicrob Agents Chemother 59, 4616-24. <http://aac.asm.org/content/early/2015/05/20/AAC.00864-15.abstract>
<http://aac.asm.org/content/59/8/4616.full>
<http://aac.asm.org/content/early/2015/05/20/AAC.00864-15.full.pdf+html>

Feng J, Auwaerter PG, Zhang Y. (2015) **Drug combinations against Borrelia burgdorferi persists in vitro: eradication achieved by using daptomycin, cefoperazone and doxycycline.** PLoSOne 10:e0117207. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0117207>

Meriläinen L, Brander H, Herranen A, Schwarzbach A, Gilbert L (2016) **Pleomorphic forms of Borrelia burgdorferi induce distinct immune responses.** Microbes Infect. pii: S1286-4579(16)30029-6. doi: 10.1016/j.micinf.2016.04.002. <http://www.ncbi.nlm.nih.gov/pubmed/27139815>
„We confirmed that spirochetes and round bodies present different protein profiles and antigenicity. In a Western blot analysis Lyme disease patients had more intense responses to round bodies when compared to spirochetes. These results suggest that round bodies have a role in Lyme disease pathogenesis.“

Lewis K, Shan Y (2010, 2016) **Persister Awakening.** Annu. Rev. Microbiol., 64, 357-372
[CrossRefView Record in Scopus](#) [View in article](#) and
(2016) A Salmonella Toxin Promotes Persister Formation through Acetylation of tRNA. Molecular Cell, 63, (1), 86-96 [Download PDF](#)
<https://www.sciencedirect.com/science/article/pii/S1097276516302830#bib7>

Robert A. Fisher RA, Bridget Gollan B, Sophie Helaine S (2017) **Persistent bacterial infections and persister cells.** Nature Reviews Microbiology 15, 453–464 doi:10.1038/nrmicro.2017.42
Published online. <https://www.ncbi.nlm.nih.gov/pubmed/28529326>

Billmyre RB, Heitman J (2017) **Genetic and epigenetic engines of diversity in pathogenic microbes.** PLoS Pathog 13(9), e1006468. <https://doi.org/10.1371/journal.ppat.1006468>
<http://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1006468>
„Here, we have highlighted some of the myriad mechanisms by which microorganisms as diverse as fungi, oomycetes, bacteria, and parasites generate phenotypic diversity to better exploit their environments and survive extreme stresses. Both pathogens and their hosts take part in a perpetual

evolutionary arms race. Each adapts to tip the balance in their own favor, but each also faces unique biological constraints. As a result, eukaryotic hosts evolve layers of complexity to their defenses, while pathogens discard the rule book and alter their phenotype by any and all means available.“

Wörmer L, Hoshino T et al. (2019) **Microbial dormancy in the marine subsurface: Global endospore abundance and response to burial.** *Science Advances* 5(2), eaav1024 DOI: 10.1126/sciadv.aav1024 <https://advances.sciencemag.org/content/5/2/eaav1024>

[Jiayu Yu, Yang Liu, Huijia Yin, Zengyi Chang](#) (2019) **Regrowth-delay body as a bacterial subcellular structure marking multidrug-tolerant persisters.** *Cell Discov.* 5, 8. Published online doi: [10.1038/s41421-019-0080-3](https://doi.org/10.1038/s41421-019-0080-3) PMID: [30675381](https://pubmed.ncbi.nlm.nih.gov/30675381/) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6341109/>

„Here, we report our accidental discovery of a subcellular structure that we term the regrowth-delay body, which is formed only in non-growing bacterial cells and sequesters multiple key proteins. ... By the same token, in clinics, we might be able to find ways to eradicate the multidrug-tolerant recalcitrant pathogen persisters by promoting the dissolution of their regrowth-delay bodies in conjunction with an antibiotic treatment.“

Nanobacteria <http://www.whale.to/a/nanobacteria.html>

Culture and detection method for sterile-filterable autonomously replicating biological particles
<http://www.google.com/patents/US5135851>

Advanced PubMed MEDLINE Search Bacterial L-forms (mehr als 217 Veröffentlichungen):
<http://www.unboundmedicine.com/medline/ebm/classic?in=kw|bacterial%20l-forms&in=jn|&in=au>
Search original: <http://www.unboundmedicine.com/medline/ebm/search>

<http://www.ncbi.nlm.nih.gov/pubmed/17168999>

<http://www.ncbi.nlm.nih.gov/pubmed/19426852>

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC172922/pdf/100320.pdf>

<http://www.jimronline.net/content/full/2005/58/0545.pdf>

<http://cmr.asm.org/content/10/2/320.long>

<http://mibr.asm.org/content/62/4/1094.long>

https://chronicillnessrecovery.org/index.php?option=com_content&view=article&id=117&Itemid=22

➔ **NanoBiotech Supporting Science & Clinical Trials**

<http://nanobiotech.squarespace.com/search-published-studies-arti/>

➔ **Urobac**

http://www.nanobiotechpharma.com/index.php?command=show_details&product_id=2

Spirochaeten

➔ **Borrelia** <http://www.erlebnishaft.de/stressvar2.pdf>

➔ Dickson K (2000) **Historical Observations of Spirochetal Cysts and L-Forms**

<http://www.lymenet.de/literatur/cystsl.htm>

Mycobacterien TBC, Mycobacteria other than tuberculosis (MOT), Sarkoidose und Lepra

Fontes A. (1910) Bemerkungen über die Tuberkulose Infektion und ihr Virus. Mem. Inst. Oswaldo Cruz, 2, 141-146

Calmette A, Valtis J. (1926) Virulent filterable elements of tubercle bacillus. Ann. Med. 19, 553

Lucksch F. (1931) Körnchenformen und Filtrierbarkeit des Tuberkelbazillus. Beitr. Klein. Tuberk. 77, 56-59

Bernstein. (1933) Unbekannte Formelemente im Sputum von Tuberkulosekranken. Beitr. Klin. Tuberk. 82, 504-505.

Bassermann FJ (1955) Die L-form des Tuberkuloseerregers in elektronoptischer Darstellung. Beitr. Klein. Tuberk. 113, 134-135

Mattman LH, Tunstall LH, Mathews WW, Gordon DL (1960) L variation in mycobacteria. Am. Rev. Respir. Dis. 82, 102-211

Korsak T. (1975) Occurrence of L forms in a case of generalized mycobacteriosis due to *Mycobacterium scrofulaceum*. Acta Tuberc. Pneumol. Belg. 66, 445-469

Takahashi S (1979) L phase growth of Mycobacteria. 1. Cell wall deficient form of Mycobacteria. Kekkaku, 54, 63-70

Judge MS, Mattman LH (1982) Cell wall deficient mycobacteria in tuberculosis, sarcoidosis and leprosy. In Cell Wall Deficient Bacteria, Domingue G. J. Ed., Addison-Wesley, Reading, MA, 257-298

Golyshevskaya VI, Zemskova ZS, Kovrolev MB. (1984) Characteristics of the filterable forms of *Mycobacterium tuberculosis* and their pathological importance. Zh. Microbiol. Epidemiol. Immunobiol. 6, 23-27

Zemskova ZS et al. (1985) Generalized TB caused by L forms of TB Mycobacteria in a child. Probl. Tuberk. 2, 64-66

Berezowsky BA, Salobai R. (1988) Role of mycobacterial L variants in development and progress of pulmonary tuberculosis relapses. Problem Tuberk. 4, 32-35


Biron MG, Soloveva IP. (1989) Acute hematogenic generalization of tuberculosis caused by L forms of Mycobacteria. Probl. Tuberk. 8, 75-76

Zhang DR. (1993) Clinical and epidemiological significances of L forms of *Mycobacterium tuberculosis*. Chin. J. Tuberc. Respir. Dis. 16(3), 181-183

Dorozhkova IR, Zamskova ZS, Krudu VN et al. (1995) Endogenous reactivation of tuberculosis as a result of reversion of persistent mycobacterial L-forms. Probl. Tuberk. 3, 43-46

Hulten K, Karttunen TJ, El-Zimaity HM, Naser SA, Collins MT, Graham DY, El-Zaatari FA (2000). Identification of cell wall deficient forms of *M. avium* subsp. *paratuberculosis* in paraffin embedded tissues from animals with Johne's disease by in situ hybridization. J Microbiol Methods 42 (2), 185–95. doi:10.1016/S0167-7012(00)00185-8. PMID 11018275.

Schwartz D, Shafran I, Romero C, Piroalli C, Biggerstaff J, Naser N, Chamberlin W, Naser SA (2000) **Use of short-term culture for identification of *Mycobacterium avium* subsp. *paratuberculosis* in tissue from Crohn's disease patients.** Clinical Microbiology and Infection. 6, 303–307 <https://www.ncbi.nlm.nih.gov/pubmed/11168138>
« The time necessary for culture of the isolates from tissues of patients with Crohn's disease in liquid M7H9 medium ranges between 10 to 12 weeks in the case of resection and up to 40 weeks in the case of biopsy » .

Wakamoto Y, Dhar N, Chait R, Schneider K1, Signorino-Gelo F, Leibler S, McKinney JD (2013) Dynamic Persistence of Antibiotic-Stressed Mycobacteria. Science 339(6115) 91-95 DOI: 10.1126/science.1229858 [Abstract Full Text Full Text \(PDF\)](#) 

Brucellen

Hatten BA, Sulkin SE. (1966) Intracellular production of *Brucella* L forms. I. Recovery of L forms from tissue culture cells infected with *Brucella abortus*. J. Bakteriol. 91, 285-296.

Mycoplasmen

Razin S, Yogeve D, Naot Y (1998) [Molecular Biology and Pathogenicity of Mycoplasmas](#). Microbiol. Mol. Biol. Rev. 62(4), 1094–156. [PMC 98941](#). [PMID 9841667](#).

Staphylococcus aureus

Trofimova ND (1959) Studies of the conditions for regeneration of filterable forms of staphylococci. Microbiol. J. Acad. Sci. Ukrain 21, 45

Fuller E, Elmer C, Nattress F, et al (2005). [β-Lactam Resistance in Staphylococcus aureus Cells That Do Not Require a Cell Wall for Integrity](#). Antimicrob. Agents Chemother. 49 (12), 5075–80. doi:[10.1128/AAC.49.12.5075-5080.2005](#). [PMC 1315936](#). [PMID 16304175](#).

Streptokokken

Cook J, et al. (1969) Chronic arthritis produced by streptococcal L-forms. J Pathol. 99 (4), 283-297.

Green MT, Heidiger Jr. PM, Domingue GJ (1974) Proposed reproductive cycle for a relatively stable L-Phase Variant of Streptococcus faecalis. Infect Immun 10, 915-927

[Rollin G](#), [Tan X](#), [Tros F](#) et al. (2017) Intracellular Survival of Staphylococcus aureus in Endothelial Cells: A Matter of Growth or Persistence. [Front Microbiol](#). 8, 1354. Published online 2017 Jul 19. doi: [10.3389/fmicb.2017.01354](#) PMCID: PMC5515828 PMID: [28769913](#) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5515828/>

Nocardien

Beaman BL (1980). [Induction of L-phase variants of Nocardia caviae within intact murine lungs](#). Infect. Immun. 29 (1), 244–51. [PMC 551102](#). [PMID 7399704](#).

Beaman BL, Scates SM (1981). [Role of L-forms of Nocardia caviae in the development of chronic mycetomas in normal and immunodeficient murine models](#). Infect. Immun. 33 (3), 893–907. [PMC 350795](#). [PMID 7287189](#).

Echeria coli

Choi JH, Lee SY (2004) Secretory and extracellular production of recombinant proteins using Escherichia coli. Appl. Microbiol. Biotechnol. 64 (5), 625–35. doi:[10.1007/s00253-004-1559-9](#). [PMID 14966662](#)

Joseleau-Petit D, Liébart JC, Ayala JA, D'Ari R (2007). [Unstable Escherichia coli L Forms Revisited: Growth Requires Peptidoglycan Synthesis](#). J. Bacteriol. 189 (18), 6512–20. doi:[10.1128/JB.00273-07](#). [PMC 2045188](#). [PMID 17586646](#).

Salmonellen

Nix RN, Altschuler SE, Henson PM, Detweiler CS (2007) Hemophagocytic macrophages harbor Salmonella enterica during persistent infection. PLoS Pathog. 3, e193

[Claudi B](#), [Spröte P](#), [Chirkova A](#) et al. (2014) Phenotypic Variation of Salmonella in Host Tissues Delays Eradication by Antimicrobial Chemotherapy. [158\(4\)](#), 722–733
DOI: <http://dx.doi.org/10.1016/j.cell.2014.06.045>
<http://www.cell.com/cell/abstract/S0092-8674%2814%2900872-1>

Helaine, S et al. (2014) Internalization of Salmonella by macrophages induces formation of nonreplicating persisters. *Science* 343, 204–208.

Listerien

Brem AM, Eveland WC. Inducing L-forms in *Listeria monocytogenes* type 1 through 7. *Appl. Microbiol.* 15, 1510.

Brem AM (1968) The role of L-Forms in the pathogenesis of *Listeria monocytogenes* infections. Ph. D Dissertation, University of Michigan, Ann Arbor.

Prosorowsky S, Kotljarova J, Fedotova I et al. (1976) Pathogenicity of Listerial L-Forms in Spheroplasts, Protoplasts and L-Forms of Bacteria. *INSERM.* 65, 265-272

Beson CA, Baugh CL. (1983) Cell wall deficient forms of *Listeria monocytogenes* as a natural phenomenon. *Abst. Ann. Meet ASM*

Dell'Éra S, Buchrieser C, Couvé E et al (2009) *Listeria monocytogenes* L-Forms Respond to Cell Wall Deficiency by Modifying Gene Expression and the Mode of Division. *Mol Microbiol.* 73, 306-322

Bacillus subtilis

Gilpin RW, Young FE, Chatterjee AN (1973) [Characterization of a Stable L-Form of *Bacillus subtilis* 168](#). *J. Bacteriol.* 113 (1), 486–99. [PMC 251652](#). [PMID 4631836](#).

Allan EJ (1991) Induction and cultivation of a stable L-form of *Bacillus subtilis*. *J. Appl. Bacteriol.* 70 (4), 339–43. [doi:10.1111/j.1365-2672.1991.tb02946.x](#). [PMID 1905284](#).

Leaver M, Domínguez-Cuevas P, Coxhead JM, Daniel RA, Errington J (2009) [Life without a wall or division machine in *Bacillus subtilis*](#). *Nature* 457 (7231), 849–53. [doi:10.1038/nature07742](#). [PMID 19212404](#).

Proteus mirabilis

Rippmann JF, Klein M, Hoischen C, et al (1998) [Procaryotic Expression of Single-Chain Variable-Fragment \(scFv\) Antibodies: Secretion in L-Form Cells of *Proteus mirabilis* Leads to Active Product and Overcomes the Limitations of Periplasmic Expression in *Escherichia coli*](#). *Appl. Environ. Microbiol.* 64 (12), 4862–9. [PMC 90935](#). [PMID 9835575](#).

Fungi

Tunstall LH, Mattman LH. (1961) L variation in *Candida* species. *Bacteriol. Proc.* 1961, 83

Rosner R. (1966) Isolation of *Candida* protoplasts from a case of *Candida* endocarditis. *J. Bacteriol.* 91, 1320-1326

Swieczkowski DM, Mattman LH, Truant JP et al. Cell wall deficient forms of *Candida albicans* in mycohemias. *Lab. Med.* 1, 41-42.

Chlostridium botulinum

Brown GW, King G, Sugiyama H (1970) Penicilline-lysocyme conversion of *Chlostridium botulinum* Types A and E into protoplasts and their stabilization as L form cultures. *J. Bacteriol.* 104, 1325-1331 <http://www.ncbi.nlm.nih.gov/pubmed/16559111>
[s.a. http://www.bfr.bund.de/cm/343/chronischer-botulismus-aktueller-stand-der-wissenschaft.pdf](http://www.bfr.bund.de/cm/343/chronischer-botulismus-aktueller-stand-der-wissenschaft.pdf)

Bakterioplankton

[Yawata Y](#), [Cordero OX](#), [Menolascina F](#) et al. (2014) **Competition–dispersal tradeoff ecologically differentiates recently speciated marine bacterioplankton populations.** [PNAS](#), 111, 5622-27.
<http://www.pnas.org/content/early/2014/04/01/1318943111>

→ **Gen-Dynamik** http://www.xerlebnishaft.de/gen_dynamik.pdf

Therapie, therapy

→ **Chronic inflammatory disorders** http://www.kabilahsystems.de/ko-erreg_eupd1.pdf

→ **Huismans BD (2019) BIOFILM MEDIZIN.**
<https://www.shaker.de/de/content/catalogue/index.asp?lang=de&ID=8&ISBN=978-3-8440-6830-6>

[Bernt-Dieter Huismans](#), Letzte Revision Dezember 2019 www.Huismans.click



Back to top: <http://www.erlebnishaft.de/stressvar1.pdf>