Bacterial Endosymbiosis in Cells

The Integration of Pathogenic Microbes as Cell Organelles

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„Disease will never be cured or eradicated by present materialistic methods, for the simple reason that disease in its origin is not material. What we know as disease is an ultimate result produced in the body, the end product of deep and long acting forces." (Edward Bach)

It has long been supposed that human cells developed from „upgraded" microorganisms. This insight and some of its principles were formulated almost 100 years ago by Prof. Enderlein, among others, and systematically researched over a period of more than 40 years with the aid of darkfield microscopy. Summaries of his results can be found in books such as „Bacteria Cyclogeny" and „Akmon, Vol. I - III" by Prof. Günther Enderlein, „Blutuntersuchung im Dunkelfeld" *(„Blood examination in darkfield")* by Dr. Maria Bleker, „Die unsichtbare Macht des Endobionten" *(„The unseen might of endobionts")* by practitioner Peter Linnert or „Dunkelfeld, Blutdiagnostik, Bioelektronische Diagnostik nach Vincent – Ein Leitfaden zum Pleomorphismus nach Prof. Günther Enderlein und Dr. Wilhelm von Brehmer in Verbindung zum bioelektronischen Terrain nach Vincent" *(„Darkfield, blood diagnosis, bioeletronic diagnosis according to Vincent – A guide to pleomorphism according to Prof. Günther Enderlein and Dr. Wilhelm von Brehmer in association with bioelectronic terrain according to Vincent")* by practitioner Christiane H. I. Häring, Dip. Eng. (All these titles are available from the Semmelweis Publishing House.)

Symbiosis and parasitism

Symbiosis refers to the intimate association between two different species to their mutual benefit. Human beings, as well as most animals and plants (hosts), live in a symbiotic relationship with microorganisms (symbionts). Examples include colonies of bacteria living on the skin and in the digestive tract or even on the roots of plants.

For the symbiotic microorganism, this association means food, protection and a stable milieu; for the host, the association can mean a source of nutrients and protection from other (pathogenic) microbes.

The term „symbiosis" was originally defined by the German botanist Anton de Bary (1873) as „differently named organisms living together". At first, no differentiation was made between whether the two partners were beneficial or damaging to one another. Nowadays, symbiosis or „mutualism" means a positive interaction between one small partner (symbiont) and one large partner (host) to their mutual benefit, whilst a negative interaction is called „parasitism". A neutral, balanced relationship between the two partners is called „commensalism".

However, the relationship between the two partners does not necessarily have to be stable. So, for example, parasitism may develop from a relationship of neutral commensalism, if the needs of the smaller partner can no longer be satisfied by the host. One example of this is the bacterium *Pseudomonas aeruginosai*, which is found in the environment and as a commensal organism on the skin and in the large intestine. This microbe can become a parasite, a so-called „opportunistic pathogen", because of a shift in the balance and a significant change in the milieu, e.g. as the result of a skin burn or a blockage of the meridian of the large intestine.

However, as more recent scientific studies of amoebae show (see below), it is also possible for pathogenic parasitic microorganisms to be assimilated by the cells and integrated into them in the form of regular organelles. Thus, it is possible for pathogens to become true symbionts! Consequently, a cell can come into being with completely new and improved characteristics. According to the view of modern evolutionary biologists, this process is a basic prerequisite for the development of a metazoic life form.

In many cases, living together over a long period of time can lead to a so-called „symbiogenesis" with the development of new organs, new bodies and new species. The term „symbiogenesis" was introduced by the Russian scientist Constantine Merezhkovsky (d. 1921) who used it to describe the formation of new organs and organisms by symbiont fusion.

Uniqueness as a result of assimilation – the modern theory of endosymbionts

A few decades ago, new methods of embryology and biochemistry were developed, as a result of which

new ideas relating to phylogenetic development also became possible. For example, the peculiarities of larval development or the linear succession of amino acids in certain proteins could be studied. In the past few years, greatly improved methods of electron and light microscopy have also enabled completely new insights into the internal structure of minute living creatures and the cells that go to make up larger life forms and unearthed an enormous wealth of new details.

In 1959. R.H. Whitaker first presented his concept of the „five kingdoms of organisms living on Earth". This concept, which has become more and more accepted by scientists in the past few decades, covers the following kingdoms of the most important life forms, indicating the minimum number of integrated genetic systems (taken from Prof. Lynn Margulis: "Die andere Evolution" *[„The Other Evolution"]*, Spektrum, 1999).

- Prokaryotes (Prokaryotae) or Monera: bacteria which have not come into existence as a result of symbiogenesis. Minimum number of integrated genomes: 1
- Protoctista (Protista): algae, single-cell organisms (protozoa), mycetozoa and other living creatures which live in water or are parasitic and are less well-known. Minimum number of integrated genomes: 2
- Fungi: moulds, pileate fungi, lichens. Minimum number of integrated genomes: 3
- Animals (Animalia): invertebrates and vertebrates. Minimum number of integrated genomes: 4
- Plants (Plantae): mosses, ferns, gymnosperms and angiosperms. Minimum number of integrated genomes: 5

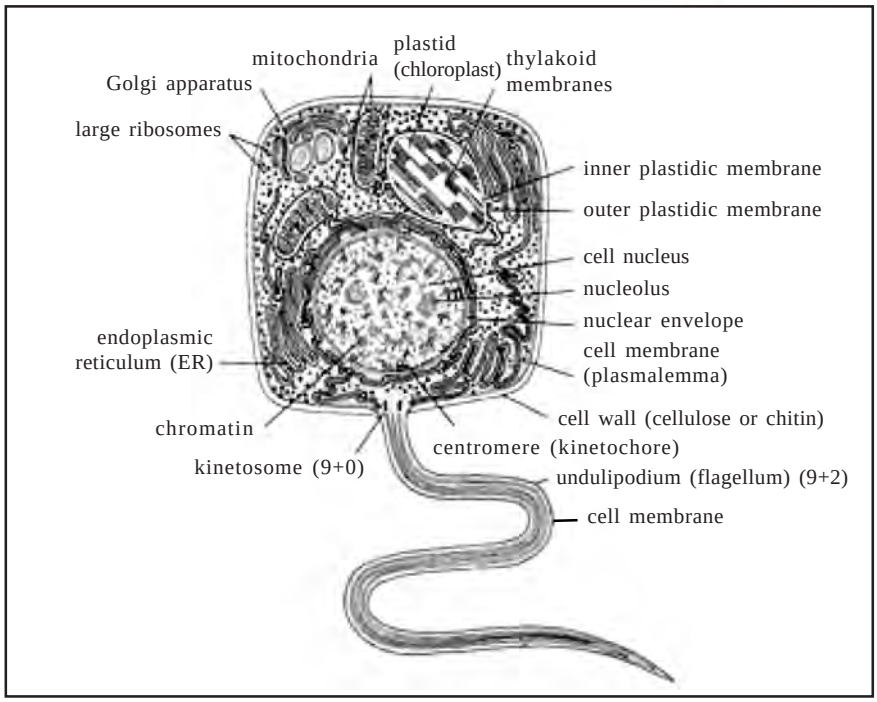


Fig. 1: The schematic structure of a typical eukaryotic cell (taken from Lynn Margulis and Karlene V. Schwartz: „Die fünf Reiche der Organismen – ein Leitfaden" [„The five kingdoms of organisms – a guide"], *Spektrum-Verlag, 1989).*

Prokaryotes are differentiated from the other four kingdoms (the so-called „Eukaryota") by the fact that they do not have a cell nucleus. Their hereditary material (so-called „nucleoid") is not organised in chromosomes and surrounded by a protein shell. However, this does not necessarily mean that their biochemistry is also simpler.

Eukaryotic cells have come about as a result of the fusion of at least 2 to 5 species, and they contain differing, relatively large cell structures (so-called „organelles"), from which some are demarcated from the remaining cytoplasm by their own membranes. Fig. 1 shows the typical scheme of a eukaryotic cell according to electron microscope findings (taken from Lynn Margulis and Karlene V. Schwartz: „Die fünf Reiche der Organismen – ein Leitfaden" *[„The five kingdoms of organisms – a guide"]*, Spektrum-Verlag, 1989). Not all the structures shown are present at the same time in every eukaryotic cell.

Fig. 2 shows the phylogeny of living organisms according to the „serial endosymbiont theory". This theory implies that evolution occurred as a sequence of symbiotic fusion processes. However, over the past few years the evidence for bacteria also having been able to come into being as a result of evolutionary retrogression has increased. A major indicator for this is the sexual reproduction, which normally occurs only in higher organisms occurring par-

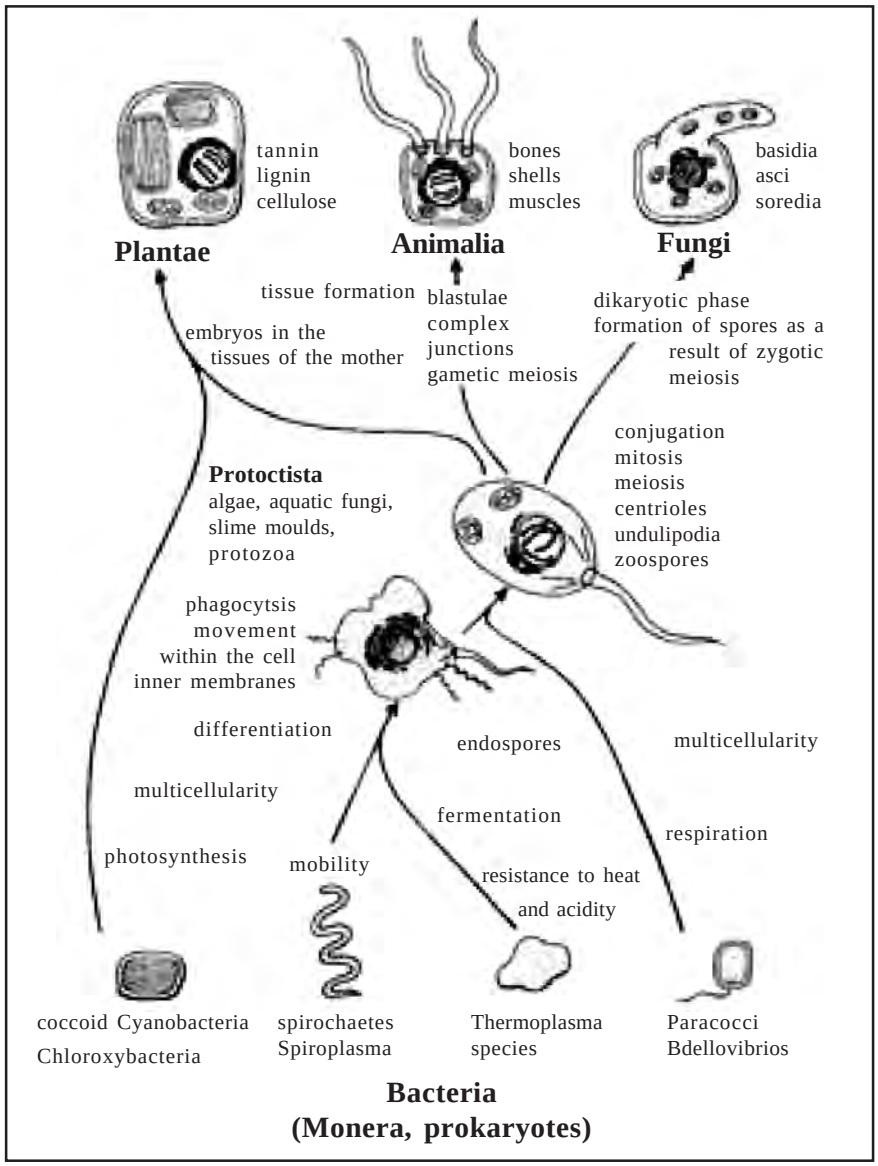


Fig. 2: The phylogeny of living organisms according to the „serial endosymbiont theory" (taken from „Die andere Evolution" [„The other evolution"] *by Lynn Margulis (1999))*

ticularly among pathogenic bacteria. This and other indicators point to the fact that during their evolution, the majority of pathogenic bacteria were originally plants or fungi, which have lost their chlorophyll and have adapted to a parasitic lifestyle. Further remarks on this point are to be found in the article „Professor Enderlein's Forschung aus heutiger Sicht" *[„Professor Enderlein's research from today's standpoint"]* in SANUM Post no. 56, pp. 2-11, 2001.

In addition to endosymbiotic microorganisms, microbes which have not entered into a symbiotic relationship also appear in mammalian cells. For the most part, these are cell wall deficient („CWD") forms of bacteria, which as commensal organisms do not damage the host, but also as parasites are pathogenic (see also Lida Mattmann: „Cell wall deficient forms – stealth pathogens", CRC, 3rd edition, 2001).

According to Margulis, fungi came into existence as a result of the fusion of at least three species of bacteria.

Cell wall deficient fungi are found in the blood only in the final stage of chronic diseases, such as Kaposi's sarcoma as a final stage of AIDS, and in the brain etc. in the late phase of neurodegenerative diseases.

So a positive reaction between an antiserum against prion protein (PrP) 27-30 in the amyloid plaques and *Aspergillus* were found in the brains of people who had died of the degenerative „prion diseases" Creutzfeld-Jakob disease (CJD) and Gertmann-Sträussler-Scheinker syndrome (GSS) (Pfeiffer et al., 1992). Fig. 3 shows the positive reaction of the fungus with the anti-PrP 27-30 anti-serum in the cerebral cortex of a patient suffering from CJD.

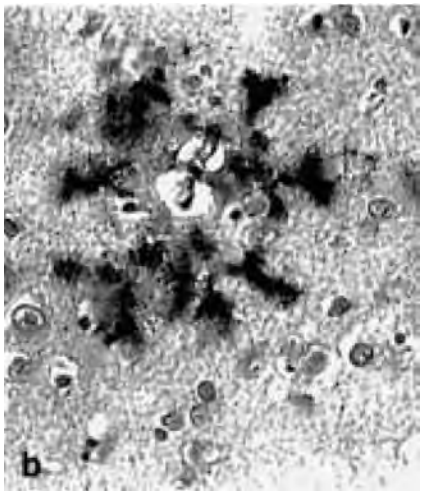


Fig. 3: A positive reaction (dark areas) by Aspergillus *to the anti-PrP 27-30 anti-serum in the cerebral cortex of a patient suffering from CJD (magnification x400, from Pfeiffer, J., J. Doerr-schott and Tateishi, J.: „Immunohisto-chemistry with anti-prion protein 27-30 gives reactions with fungi", Acta Neuropathologica, 84 (3), pp. 346-347, 1992).*

Origin of the cell constituents and organelles

According to Margulis (1999), the nucleocytoplasm, the basic substance of cells, derived from archaebacteria; in particular the greater part of the protein-synthesising metabolism derives from thermoplasma-type archaebacteria. These archaic bacteria love a hot, acid milieu and have no cell wall. As a result, they are pleomorphic.

A large part of the genome of this bacterium was „borrowed" by other species of bacteria and built into their own genome (Ruepp, A. et al: „The genome sequence of the thermoacidophilic scavenger *Thermoplasma acidophilum*", Nature 407, pp. 508-513, 2000).

Fig. 4 shows the pleomorphic bacterium *Thermoplasma acidophilum* which is similar to a *Mycoplasma*. This bacterium can vary greatly in diameter (0.2-5 µm).

The oxygen-breathing mitochondria developed from purple bacteria (also called proteobacteria). The chloroplasts and other plastids from algae and plants were once free living cyanobacteria, capable of photosynthesis.

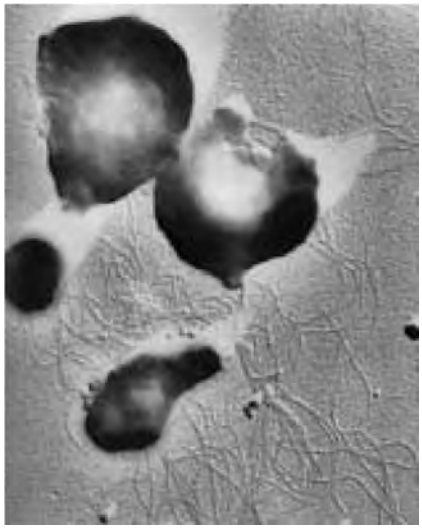


Fig. 4: Thermoplasma acidophilum *(from Madigan, M.T., J.M. Martinko and J. Parker: „Brock Biology of Microorganisms", Parker, 10th Edition, 2002).*

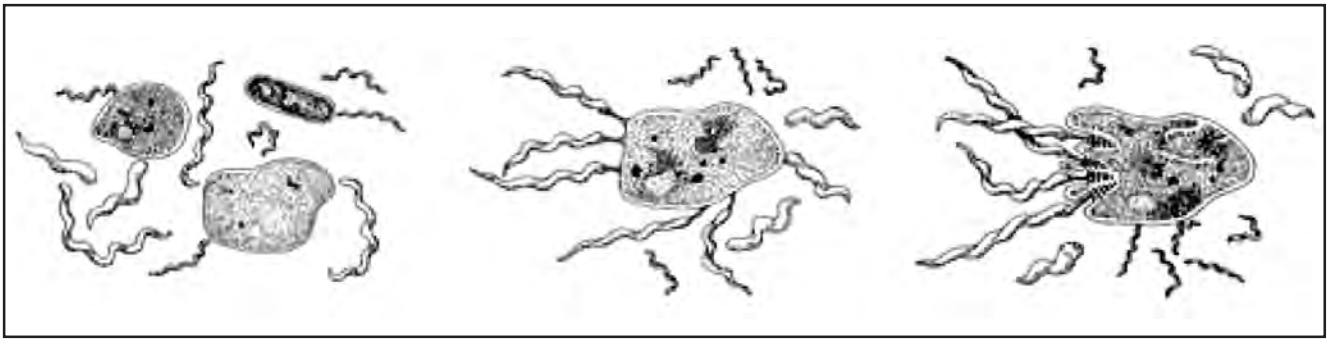
Bdellovibrios are small (0.2-0.5 µm thick, 0.5-1.4 µm long), curved, flagellated, gram-negative, predatory bacteria, which are very mobile. They have a two-phase life cycle: a very mobile hunting phase, in which they hunt other gram-negative bacteria, and a non-mobile reproduction phase within the captured bacteria. Because of their unbelievable mobility (speed: 100x the diameter of a bacterium per second, corresponding to 1 m in less than 2 hours) and their predatory lifestyle, bdellovibrios are also called „the world's smallest living hunters".

The very mobile **spirochaetes**, which evolved into the mobility organelles („undulipodia") of the somatic cells of animals and human beings and have a characteristic fine structure consisting of nine pairs of microtubules, are of particular significance in symbiogenesis. According to Margulis, the tails of sperm, the cilia in the cells of uterine tubes and those in the respiratory passages derive from free living spirochaetes which were assimilated by our archaebacterial ancestors.

Fig. 5 from the book by Margulis (1999) shows this evolution. According to this, flagellated single-celled organisms like the trichomonades represent an intermediate stage in phylogenetic evolution.

In human beings and animals, spirochaetes – which probably represent the material; aspect of the „serpent" in the Bible – have a strong relationship in terms of energy to the kidney/bladder meridian system.

The bladder/kidney system is one of the most important vital energy systems, generally because it supplies energy to the inside of



Drawing by Kathryn Delisle

Fig. 5: Spirochaetes evolve into undulipodia (from „Die andere Evolution" [„The other evolution"] by Lynn Margulis, 1999)

the skull and is jointly responsible for the well-regulated function of the excretory and sexual organs. There are also points on the bladder meridian, which runs parallel to the spine on both sides, where energy is transferred to all the other meridians; as a result a long-term blockade of this energy system can lead to the impairment of the function of the whole body.

Chronic blockades of this system (as a result of fears, electric smog and/or heavy metals, for example) create a milieu and disease situation in which spirochaetes feel very comfortable. Further comments on the relationship between bacteria and fungi with the energy milieu can be found in a corresponding article in SANUM Post No. 58, pp. 7 – 11, 2002.

The foremost examples of diseases associated with spirochaetes are the venereal diseases such as syphilis or trichomonal infection; but spirochaetes are also originally involved as cell wall deficient forms of bacteria in other neurodegenerative disorders such as Alzheimer's disease, Parkinson's disease, ALS and neuroborreliosis („forest syphilis") (Mattmann, 2001).

Of late, there has been strong evidence from research by the American anaesthetist Prof. Stewart Hameroff, University of Arizona, and the English physicist Sir Roger Penrose, University of Oxford, that intellect is created in the brain by the microtubules in its nerve cells. As already mentioned above, the microtubules in the nerve cells have, however, developed from symbiotic spirochaetes. According to Hameroff and Penrose, the human brain is a very effective quantum computer.

Isolation of the endosymbiosis in chronic diseases

Compared to the environment in which they live freely, for intracellular symbionts, the cell is a very extreme milieu (Moulder, J.W.: „The cell as an extreme environment", Proc. R. Soc. Lond. vol. 204, pp. 199-210, 1979). They can only cope with these extreme conditions and be sustained, if they are in a symbiotic association.

If the conditions of the physiological milieu change in the course of a chronic disease, symbiosis can no longer be sustained in the somatic cells and gradually the symbionts leave the cells. At the same time, the sensitivity of the whole organism to the influence of pathogenic microorganisms increases. So the insight of Claude Bernard, made over 130 years ago, is proved true today: „The terrain is everything, the microbe is nothing".

The conditions of microbial endosymbiosis have been used for decades in the making of darkfield diagnoses of vital blood. First, in this diagnosis no distinction is made between symbiotic organisms and non-symbiotic, pathogenic microbes or commensal organisms. However, an assessment of the stage that a chronic disorder has reached, because of the microscopic image, is reliably possible on the basis of the systematic diagnoses which were made by researchers like Enderlein or Brehmer over a period of decades and documented in the respective textbooks.

In a pathological shift of the milieu in the blood and tissues, bacteria can be released from their symbiotic association and become pathogenic again as individual forms. The protection of the sick organism against other pathogenic microorganisms is greatly impaired by the dissolution of the endosymbiosis. As a result, cell-deficient forms of other pathogenic microbes in particular, which the immune system cannot remove

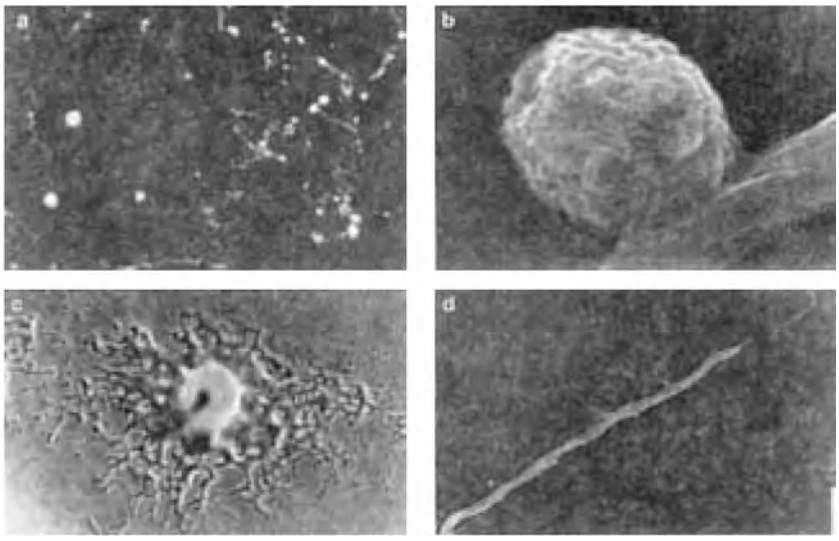


Fig. 6: The distinctive pleomorphism of Borrelia burdorferi, *the borreliosis pathogen (V. Preac-Mursic et al.: J. Infec. 24 (3), pp. 218-228, 1996, from Mattmann, 2001)*

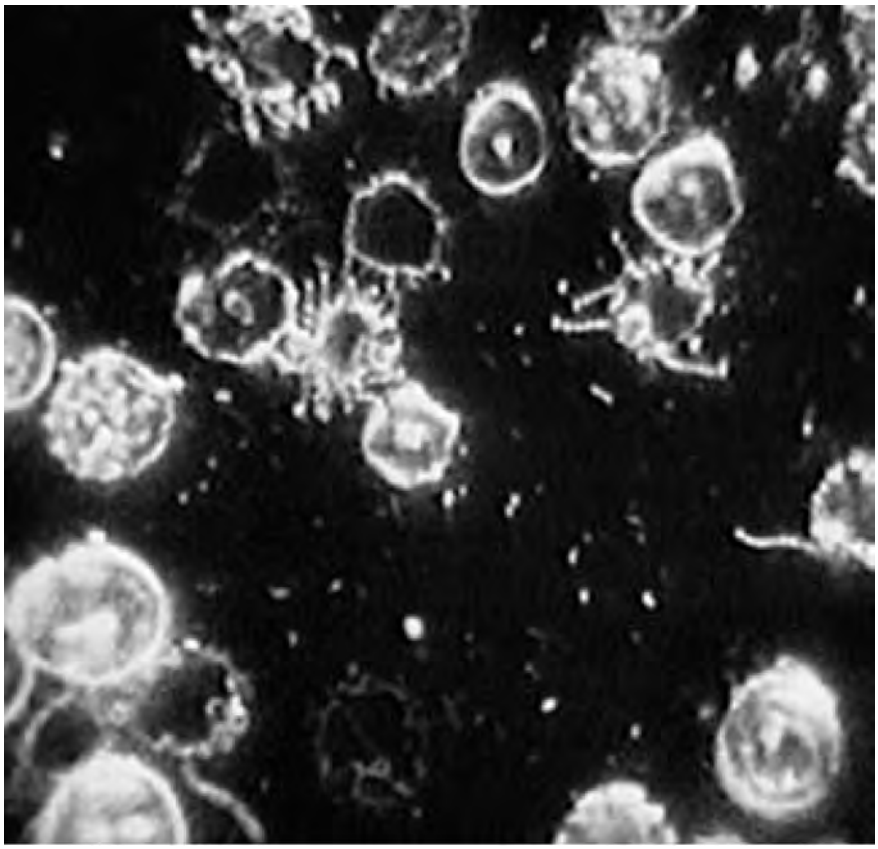


Fig. 7: spirochaetes leave the blood cells in the form of undulipodia (from the film „Die Blutdiagnostik im Dunkelfeld auf benigne und maligne Erkrankungen" [„Darkfield blood diagnosis of benign and malignant disorders"] made by physician Dr. E. Farrensteiner and his wife Ms Christel and dating from 1959)

offhand, are able to reproduce in the body.

Fig. 6 shows the distinctive pleomorphism of spirochaetes, taking as an example *Borrelia burdorferi*, the borreliosis pathogen. **The growth of pathogenic bacteria takes place in the living organism mainly during a general or local energy blockage, whilst pathogenic fungi and yeasts predominantly reproduce where there is a general or local lack of energy.**

According to what the conditions are like in the milieu, spirochaetes can grow as little individual grains or like strings of pearls (a) in a milieu which is very energy-rich (e.g. in consequence of an energy blockade of the bladder/kidney meridian), or like fungi (c), or as long threads (d) in a milieu which is lacking in energy (e.g. during a degenerative phase such as arthrosis). These forms of growth can also be observed in the laboratory when antibiotics are given to a *Borrelia* culture.

The breaking down of intracellular symbiosis in the cancer stage becomes particularly clear as the end phase of the evolution of the chronic disease (Reckeweg). As can be seen from the darkfield microscopic image in Fig. 7, taken from a film made by Dr. E. Farrensteiner and his wife Ms Christel (both pupils of Dr. von Brehmer), in this phase, the symbiotic spirochaetes initially leave the blood cells in the form of undulipodia. The film shows their powerful, whip-like movement.

These microbes were given the names *Siphonospora polymorpha* by Wilhelm von Brehmer and *Leptotrichia buccalis* by Günther Enderlein.

As the film progresses, among other things, one can see how the formerly symbiotic spirochaetes, some still conjoined with other bacteria, dart about at high speed through the microscopic field of view in the blood and above all in special microbiological cultures made from tumour tissue from cancer patients (lung cancer, sarcoma of the thorax, metastasis of a breast cancer).

The factors illustrated were recently „re-discovered" by the Russian chemist Dr. Tamara Lebedewa, who regards trichomonads as organisms which cause cancer (Tamara Lebedewa: „Krebserreger entdeckt! Alles über Entstehung, Vorsorge, Heilung" *[„Cancer-causing organisms discovered! All about their development, precautions, healing"],* Driediger, 2nd edition, 2002). But, as stated above, according to Margulis trichomonads are nothing but single-cell organisms which have arisen as a result of a microbial symbiosis of archaebacteria and spirochaetes.

Laboratory investigations into intracellular parasitism and endosymbiosis, taking the amoeba *Amoeba proteus* as a model

Kwang W. Jeon, a professor at the University of Knoxville, Tennessee,

USA, has been studying bacterial symbiosis in the amoeba *Amoeba proteus* for more than 30 years.

Amoebas belong to the group of single-cell organisms which according to endosymbiotic theory arose from the symbiosis of only a few species. Fig. 8 shows one such organism.

Fig. 8: The amoeba Amoeba proteus *(from „Mr. Alesse's Protist Page" on the Internet at* http://www.knossos.org/knossids2001/protistpage.html)

Point of departure

Jeon has kept this strain of amoeba under culture for many years. In 1966, while investigating individual amoebas under the microscope, he established that they were badly infected with rod-shaped, gram-negative bacteria. Jeon called these bacteria X-bacteria, because he could not decide where they originated. Each amoeba contains between 60,000 and 150,000 X-bacteria (Jeon, K.W.: „Change of cellular 'pathogens' into required cell components", Annals of the N.Y. Academy of Sciences 503, pp. 359-371, 1987).

Further comparisons between the normal and infected amoebas showed that the infection was causing a lot of damage to the affected single-cell organisms. This was shown by a reduction in the size of the cell, fewer cytoplasmatic crystals, a slower growth rate in the culture with a longer period of time between the generations, sensitivity to lack of nutrients, a greater fragility of the cells and a poor ability to reproduce. As a result of this damage, most of the infected amoebas died, and they had to be cultivated with great care.

When bacteria from the infected amoebas were introduced to normal amoebas, the newly infected single-cell organisms died after only a few cell divisions, which showed the high degree of virulence of the X-bacteria. Even before this, it was known that a few species of bacteria living freely carry infectious or symbiotic bacteria: however, these are mostly small in number and not damaging. The benefit that this endosymbiosis offers to both partners has not been discovered up to now.

Reduction in the virulence of the bacteria

Over the next few years, Jeon continued to cultivate the single-cell organisms infected with X-bacteria with great care; at the same time, he observed that the disadvantageous influences of the infection gradually reduced. The amoeba carrying the bacteria became healthier and grew well. The number of bacteria had levelled off at about 42,000 per amoeba.

Development on the part of the host of dependence on the bacteria which had become symbiotic

Over the next few years, it became evident that the offspring of the amoeba that were originally infected had become dependent on their bacteria after about 200 generations. The cell nuclei of the affected amoebas was incapable of generating living cells, if they were combined with amoebas not infected with the cytoplasm. They could only generate living cells satisfactorily, if bacteria or cytoplasma from the infected single-cell organisms were added at the same time or shortly after the transplantation of the nuclei.

The dependence of the infected amoebas on their symbionts was also clear from the fact that the death of the single-cell organisms occurred within one week, if the bacteria were selectively killed by means of an antibiotic (chloramphenicol) or were digested by the host as a result of being cultivated at a higher temperature. It was possible to prevent the death of the amoebas, if the symbionts were re-introduced to them.

The role of the symbionts as quasi-organelles

The symbiotic bacteria contain their own genetic material and have an independent genetic mechanism; however, during symbiotic fusion the bacteria have a strong influence on the genetic expression of the host.

So, the infected amoeba no longer produce a definite cytoplasmic protein which exercises an S-adenosylmethionine synthetase (SAMS) function. Instead, another type of protein is formed from the symbiotic bacteria, which, however, exercises a similar SAMS function (Choi, J.Y., T.W. Lee, K.W. Jeon and T.I.Ahn TU: „Evidence for

symbiont-induced alteration of a host's gene expression: irreversible loss of SAM synthetase from Amoeba proteus", J. Eukaryot. Microbiol. 44(5), pp. 412-419, 1997; Jeon, T.J. and K.W. Jeon: „Characterization of SAMS genes of Amoeba proteus and the endosymbiotic X-bacteria", J. Eukaryot. Microbiol. 50(1), pp. 61-69, 2003).

In addition, further polypeptides are synthesised by the symbiotic bacteria and released into the cytoplasm of the amoeba.

The SANUM therapy of neurodegenerative disorders

It is clear that such an incredibly complex event such as the bacterial endosymbiosis of the cells cannot regulate itself. According to the opinion of natural healing practitioners, direct regulation occurs rather through an information field at the level of the body's vital energy, the level of the energy meridian. Except in the case of diseases which are difficult or absolutely impossible to regulate, such as inherited illnesses, it makes little sense to want to treat the endosymbiosis, which has been derailed in chronic illnesses by using antibiotics or by suppressing certain metabolic functions (e.g. by means of cortisone). Such measures mostly cause the derailment to become even greater.

The main aims of regulation of cellular endosymbiosis are rather to normalise the milieu within the human host organism, to replace missing endobionts and to break down and excrete excessive and/or pathogenic microorganisms.

In addition to this therapy, disruptive fields must be removed, particularly in the dental regions, and heavy metals excreted. The vital energy system of the meridians must also be regulated and emotional blockades removed.

As natural healing practitioners regard the „syphilitic miasm" related to the spirochaetes as a component of tuberculinium, over a period of at least three months, it is necessary to stick to a diet which does not contain foodstuffs which are polluted with tuberculin (a diet according to Dr. Werthmann without cow's milk and hens' eggs and without pork).

<u>Suggested course of treatment</u>

- Energetic regulation, in particular of the kidney/bladder meridian; holistic dentistry; SANUM excretion cure (see SANUM Post No. 55, p. 14, 2001)
- SANUVIS alternating with CITROKEHL: 1 injection per week, at the same time on each occasion together with CHRYSOCOR (or *Placenta fetalis suis* Injeel from the Heel company)
- Over a period of two weeks: 1 tablet of NOTAKEHL 5X each morning, 1 tablet of FORTAKEHL 5X each evening
- After these two weeks, for a longer period of time:
  Monday to Friday: each morning 1 tablet of MUCOKEHL 5X, each evening 1 tablet of NIGERSAN 5X,
  Saturday and Sunday: each morning 1 tablet of NOTAKEHL 5X, each evening 1 tablet of FORTAKEHL 5X
- From the 2nd week: in the evening before going to bed, SANUKEHL Pseu 6X (rub in 4 drops, and at the same time take 4 drops by mouth; for a few days begin with just the rubbing in), alternating on a daily basis with SANUKEHL Coli 6X
- Immune modulation from the 3rd week: once a week or fortnight take 1 capsule in this order: LATENSIN, RECARCIN, UTILIN „S" („capsule cure")

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