



Cell wall free forms (CWD) of microorganisms - more than just a whim of nature

Under the microscope, but also when growing on an agar plate, it has been observed for a very long time that bacteria do not always grow in the same form. Since the 19th century, scholars (including Prof Enderlein) have been engaged in a fierce debate on this topic - and more or less to this day - as to whether bacteria can occur and grow exclusively in one form (monomorphism) or also in different forms (pleomorphism). The doctrine of monomorphism triumphed. However, an increasing number of publications are now describing pleomorphic growth (which also includes CWDs - cell wall deficient forms) and the significance of CWDs for the development of diseases, bringing this phenomenon back into focus (Markova, 2017).

But what exactly are CWDs? CWDs are microorganisms that grow without a cell wall. In contrast to mycoplasmas (which generally have no cell wall), there are bacteria that can switch between "normal" and cell wall-free growth. It is now known that almost all medically important bacteria are capable of switching to a CWD or L-form (Onwuamaegbu, 2005). Various factors can favour the development of the CWD form. CWDs are most frequently caused by the presence of antibiotics. If the triggering stimulus disappears, e.g. when the antibiotic intake ends, the bacteria can switch back to the normal form or remain in place as CWD and trigger chronic inflammation.

Where this phenomenon can be observed very frequently is with recurrent cystitis. Despite frequent courses of antibiotics, the symptoms return after a short time; at some point, pathogens can no longer be detected in normal diagnostics. In 2019, a working group investigated this phenomenon in older patients with recurrent cystitis. Fresh urine was taken from 30 patients and analysed for the presence of CWDs. CWDs were detected in 29 patients. The most common were various *Escherichia (E.) coli* isolates, but CWDs from *Staphylococcus*, *Klebsiella*, *Pseudomonas*, *Proteus spp.*, *Streptococcus*, *Enterobacter spp.* and *Enterococcus* were also detected.

The researchers used special osmoprotective culture media for detection. This also explains why CWDs often cannot be detected in routine diagnostics. As CWDs are not stable on a normal culture medium, the urine sample is often classified as falsely negative as a result. In addition to the difficulties in detection, CWDs are also much less easily recognised by the immune system; the innate immune system in particular actually interacts with components of the cell wall, which, however, are not present or only present to a very small extent (Mickiewicz KM, 2019).

In principle, CWDs can form during/after any antibiotic treatment, not just cystitis. SANUKEHL® preparations are used in SANUM therapy to support the patient and in particular their immune system in this situation. Areas of application are acute or chronic infections and silent inflammations. The aim is to sensitise the immune system to the pathogen in question in the case of infections with CWDs and their microbial metabolites. Even if CWDs are only now increasingly coming into the general focus, they have long been an issue for SANUM therapy.

The problem of CWDs and the associated treatment options were discussed in depth at three SANUM conferences, in 1997, 2003 and 2011.

To return to the example of recurrent cystitis: *E. coli* is one of the most common pathogens causing cystitis, and the appropriate SANUKEHL® preparation is SANUKEHL® Coli. If several pathogens play a role, e.g. if several infectious diseases are present at the same time, the corresponding SANUKEHL® preparations are taken in daily alternation. They are always used together with the system regulation preparations, usually at a later stage of the therapy.



Dosage forms

SANUKEHL® Coli D6 drops
10 ml bottle

Dosage

Adults and young people from the age of 12: 1-2x 5-10 Tr. tgl.

For further product information, please refer to the respective instructions for use.