

MBST · mode of action in wound healing

Scientific data show that MBST technology has an effect on connective tissue cells and the extracellular matrix (ECM):

- Influences the function of cells in an inflammatory state¹
- Influences the activity of protein kinases and changes the protein profile of skin fibroblasts⁴
- Leads to a significant increase of soluble ECM collagens^{5,6}
- Leads to a decrease of sparingly or non-soluble ECM collagens^{5,6}
- Enriches cell biomass with soluble glycosaminoglycan^{5,6}
- Influences resp. regulates hypoxia processes and oxygen-sensitive signalling pathways⁷
- Can cause a shift resp. readjustment of the circadian clock in fibroblast cells³
- Can adjust the frequency of oxidized Prx and intracellular reactive oxygen species (ROS) in a time and duration dependent mode³
- Stimulation of the migration of macrophages and the proliferation and migration of endothelial cells⁴
- A highly significant decrease of the subjectively assessed intensity as well as frequency of pain^{8,9,10,11}

Further information on MBST magnetic resonance therapy

Patients with chronic wounds are an enormous challenge for the medical profession. A thorough diagnosis of a chronic wound always forms the basis for a successful MBST therapy. Clean wound area and wound margin are a prerequisite for good wound healing. Patients with diabetes mellitus and high blood pressure should be correctly medicated.

Chronic wounds are usually accompanied by more or less severe wound pain. According to patient reports, MBST therapy can significantly reduce existing pain.^{8,9}

MBST · modern wound therapy for chronic wounds

MBST therapy has shown considerable success in the treatment of wound healing disorders and has caused chronic wounds to heal. Its objective is the fastest possible reparation of tissue defects and thereby a restoration of the protective function of skin with a positive influence on scar formation.

Postsurgical · Post in-patient · Accompanying rehabilitation

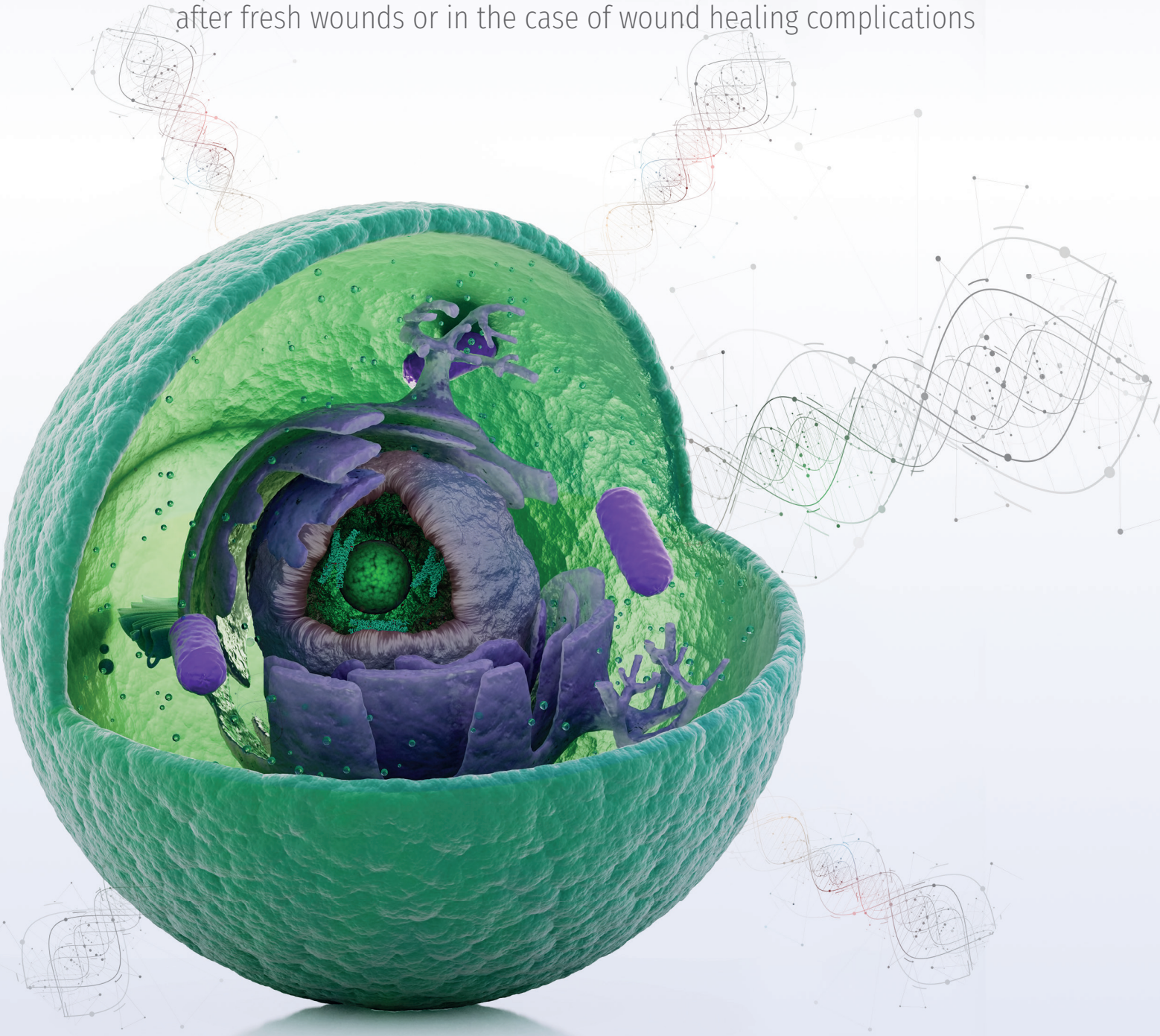
The acceleration of biological healing processes, that is the therapeutical aim of MBST magnetic resonance therapy, may reduce complaints and downtimes. No side effects have been observed in this non-drug therapy as yet.



Wound treatment and wound healing

MBST magnetic resonance therapy

Support of endogenous natural biological processes after fresh wounds or in the case of wound healing complications



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References: [1] Steinecker-Frohnwieser et al. 2014, J Orthopedics Rheumatology, 9/2014 · [2] Hoyle et al. 2017, Science Translational Medicine 9 (415), doi: https://doi.org/10.1126/scitranslmed.aal2774 · [3] Egg et al. 2017 · [4] Digel et al. 2007, Med Bio Eng Comput, 45, 91–97 · [5] Artmann 2006 · [6] Artmann 2007 · [7] Oliva 2014 · [8] Kulich et al. 2013, SCHMERZ-nachrichten 4a · [9] van Laack et al. 2011, Orthopädische Praxis 47, 11/2011, 536–543 · [10] Steinecker-Frohnwieser et al. 2009, Bone 44, 295, doi: 10.1016/j.bone.2009.03.537 · [11] Steinecker-Frohnwieser et al. 2018, Clinical and Experimental Rheumatology, 36, 294–301.
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Our vision:
Normalize wound healing
to enable the patient to live
a healthy, active and pain-free life!

Wounds

A healthy organism is able to close wounds, e. g. defects in the tissue, by its functioning healing processes. But more and more people nowadays suffer from chronic wounds that do not heal. In addition to the often resulting strong pain, the risk of infection can increase. This leads to grave restrictions in everyday life for those affected.

Physiological wound healing

Healing a wound requires a series of complex actions in the body. The wound healing process begins immediately after an injury has occurred. Cell debris or necrotic tissue is removed by the macrophages, for example, which in turn stimulate fibroblast production. These are prompted to release collagen to close the wound.

Healing phases

Normal wound healing has three dynamic phases that overlap and therefore cannot be strictly separated from one another:

- **Exudation phase · days 0–5**
In this inflammatory phase tissue debris is cleared away and the wound is cleaned.
- **Granulation phase · days 5–21**
In this phase, new healthy granulation tissue is formed to fill the wound. The fibroblasts play a major role here.
- **Epithelisation phase · days 21–60**
The wound is closed completely. The production of new collagen fibers is increased. They make up the scar tissue.

Wound healing disorders

The healthy body tries to repair a wound as quickly as possible by replacing destroyed tissue with new tissue. In case of a prevailing wound healing disorder, the natural healing processes can be impeded or interrupted.

If actions necessary for the healing process are not automatically triggered or are disturbed, chronic pain, restricted movement ability or even permanent nerve damage can develop.

Chronic wounds

A wound is considered chronic if no noticeable healing tendencies can be observed after a period of 8–12 weeks. Circulatory disorders, e.g. in an open leg (ulcus cruris), can lead to wounds that even extend through several layers of skin down to the bone.

The active principle of MBST

MBST therapy is based on the physical principle of magnetic resonance, in which hydrogen nuclei take up energy and then release it again partly to the surrounding tissue. Scientific data suggests that MBST magnetic resonance technology stimulates various biophysical processes and triggers anti-inflammatory and pain-relieving effects.¹ Damaged cells can be influenced in such a way that natural regenerative processes are triggered.

The aim of MBST magnetic resonance therapy is to actively influence disturbed wound healing processes and thus effectively support the healing rates of chronic wounds.

MBST magnetic resonance therapy for wound healing

Scientific data show that MBST technology can actively influence the functions of cells and their internal cellular clocks, which also play an important role in wound healing processes.^{2,3} Misadjusted or misregulated body cells are no longer able to perform and regulate important processes which can result for example in faulty regulations of the metabolism and disorders in the interaction of molecular mechanisms. Consequences of this can be a degeneration of tissue, disturbed regenerative processes and accompanying inflammatory reactions.

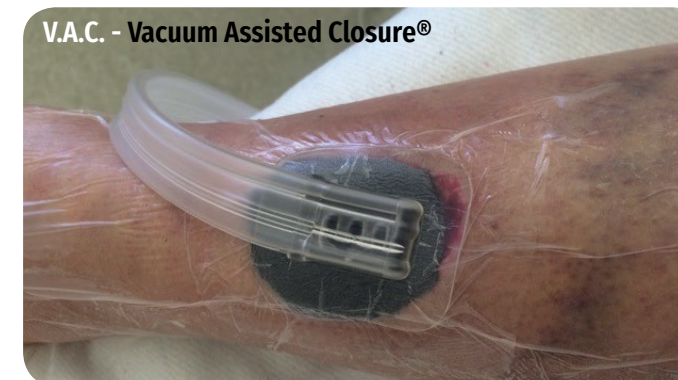
Among other things, MBST technology wants to achieve a new adjustment of the natural clock generator of our body cells. The aim is to reprogram these cellular clocks in order to enable smooth running again.

Olga B., 57 years, skin necrosis of left lower leg

The patient suffered an injury to her left lower leg in a downfall on November 11. On November 20, a necrosis of the skin had developed.

In November and December, partly under anaesthesia, several necrosectomies and a removal of a haematoma were performed and the wound was closed with a VAC which was changed several times. A skin transplantation was not possible due to the lack of granulation in the defect.

Another necrosectomy was planned because the wound showed no inclination to heal. The patient decided against it and began a MBST magnetic resonance therapy that brought the following result:



At the end of December, no healing of the wound could be observed.

Another necrosectomy was planned. MBST therapy was applied from the end of December to the beginning of January.



Already on January 4, the healing process had accelerated significantly.
14 days after the start of MBST therapy, wound closure was almost completed.

