

# **Electroceuticals: paving the path to non-invasive therapies**

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## Summary

Electroceuticals are a “pharmaceutical” form of Bioelectronics, in other words the science of developing medical devices that use electric or electromagnetic impulses to modulate the body’s circuits, neural or other, as an alternative to drug-based interventions and therapies. There are many examples of electroceuticals in use today, including mainly implantable devices (pacemakers, defibrillators, cochlear implants etc.). In our lab we are working with two non-implantable devices (external use) based on innovative technologies: Wireless Microcurrent Stimulation (WMCS) and Pulsed Electromagnetic Fields (PEMF), which are proved to be very effective for the treatment of hard-to-heal wounds and burns, while minimizing the pain following these pathologies.

We will present clinical results of patients with pressure ulcers, venous stasis ulcers, diabetic foot wounds and burns that were treated with the W200 device (WMCS - Wetling®, Denmark) and the consumable, wearable PEMF device (Actipatch®, USA) as well. The W200 device is adjusted to a distance of about 10–15 cm straight onto the wound, with an intensity of 1,5µA. Each therapy lasted 1 hour daily. The patients that used in parallel or separately the PEMF technology applied the device so that the therapeutic area was within the loop, for at least 8 hours daily or usually for almost 24 hours. All the patients demonstrated substantial improvement up to complete healing, regardless the underlying cause or the extension of the wound (ulcer, burn etc.). Although the duration of the therapy varies, in the majority of the cases the therapeutic outcome was optimal. Histochemical and microbiological studies will be presented, proving the reformation of the wounded tissue. Additional experiments are performed and we strongly believe that the application of such technologies could replace conventional pharmaceuticals in the near future.