

## Spotlight

By Anne Forde

### **New Electric Therapy Can Safely Destroy Melanoma in Mice**

Nuccitelli *et al.*

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Nanosecond pulse electric field (nsPEF) therapy for experimental tumor models has been around for several years. It offers the substantial benefits of inducing apoptosis and only affecting the tissues placed between the delivery electrodes.

Previously these authors had shown that one to three nsPEF treatments could eliminate melanomas in immune-competent mice. In this report, Nuccitelli *et al.*, raise the stakes by using athymic mice, whose immune system cannot halt tumor growth. They also use newly designed suction electrodes that are more compatible with human skin and employed a short, but high pulse length treatment.

NsPEF treatment was optimized for electrode configuration, pulse number, amplitude and frequency. After one 6-min nsPEF treatment, the fluorescent signal in mice bearing GFP melanomas could no longer be detected 24 hours later. Tumors shrank and disappeared within 5-10 days. Importantly, the changes were highly localized: capillaries narrowed, melanoma and epidermal cells shrank in the treated tissue but there was no damage in the epidermis or capillaries of the neighboring tissue. The authors used the highest pulse application possible to minimize the treatment time but always kept the temperature below 40°C. All in all, the treatment eliminated all 17 melanomas in 4 mice.

These results contribute to ongoing efforts to develop nsPEF technology suitable for humans. The suction electrodes developed in this study are more applicable to human use and the parameters used offers excellent efficacy and safety. NsPEF therapy is not cell specific and therefore has a high potential, though its use in internal body tumors still has a long way to go.