

Development of a new technology for controlled heat treatment of muscle

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Contractures Musculoskeletal injuries with a medium- to long-term painful outcome are a common health problem worldwide. Heat therapy of these injuries can be performed e.g. with thermal and electric pads, or by means of deep heat treatments (Tecar). Alternatively, thermal patches can be used, which are widely used due to their low cost and ease of application. However, thermal patches also have a slow and uncontrolled heating rate and can only be used once. The invention concerns new polymer films loaded with non-toxic nanoparticles capable of efficiently converting absorbed (red, 800nm) light into heat. The technology allows a rapid (5 to 10 seconds) and controllable increase in temperature, the possibility of developing customised therapeutic programmes, a remote activation mode via a dedicated light source and multiple use (reusability and eco-friendly production). The developed materials will be used as next-generation thermal patches overcoming the disadvantages of existing ones: low efficiency, uncontrolled heating rate, single use and skin irritation. The developed technology is poised to create a new segment within the thermal plaster market for use in medical practices. Further developments of the technology (portable light source) may open up further application possibilities and new market segments.