

## BORON-BASED FORMULATIONS FOR THE TREATMENT OF MUSCULAR DYSTROPHIES AND MUSCLE INJURIES

### Patient need addressed

Muscle repair  
Muscular dystrophies  
Muscle injuries

### The Solution

Our invention relies on providing the right biochemical signals to boost the natural muscle repair process. It is based on our finding that the simultaneous stimulation of specific cell membrane receptors induces muscle regeneration.

In models of muscular dystrophies we have seen that our technology is able to stimulate multiple cellular pathways that can compensate or by-pass damaged processes in these diseases.

In models of healthy tissue we have seen an accelerating regeneration process and reduced time of muscle repair (15 days instead of 30 days), with minimized toxicity due to the ultra-low doses of boron needed.

### Innovative Aspects

This innovative technology comprises new combinations of boron compounds and adjuvants and compositions thereof, suitable for use in a method to induce myotube formation and suppress cell mortality in a mammal in need thereof.

Furthermore, it is related to compositions comprising boron compounds, adjuvants and support platforms, which enhance the effect of synergistic activation of the boron cell membrane transporter (NaBC1) and adhesion receptors in cells.

The invention refers to the aforementioned combinations and compositions for the treatment of sport injuries that affect skeletal muscle, such as acute strain and tear injuries of muscles, a relevant factor in lost time and performance efficiency in professional athletes. The invention also refers to the treatment of pathophysiological conditions that affect skeletal muscle, in particular muscular dystrophies such as Myotonic Dystrophy or Duchenne Dystrophy.

The next step towards clinical studies is to assess optimal formulations that can provide its therapeutic effect in humans and minimize toxicity. In our research we have shown that toxicity is negligible, due to the ultra-low doses boron compounds at which our invention works.

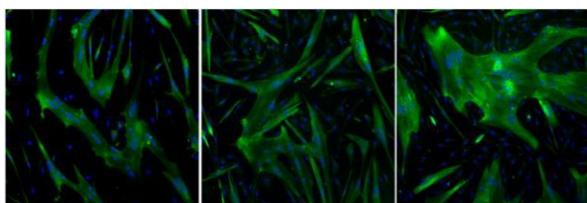


Figure on the left: Immunofluorescence images of myotubes formed after 8 days of culture of human wild type cells with a cell-adhesion adjuvant and different concentrations of a boron compound.

**Stage of Development:** *In vitro* validation performed. Finalized and ongoing animal model studies.

### Intellectual Property

European patent application [EP3978028A1](#)

International patent application [WO2022/069768A1](#)

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### Contact details

[fsantos@ciber-bbn.es](mailto:fsantos@ciber-bbn.es)  
[www.ciber-bbn.es](http://www.ciber-bbn.es)