

Peptide Therapy in Musculoskeletal Medicine

Overview

- Orthopaedic and sports medicine providers must understand the current lack of evidence to support the clinical use of injectable peptide therapies, despite their potential therapeutic and regenerative benefits [1].
- Therapeutic strategies for microfracture augmentation, such as those using growth factor-functionalized self-assembling peptide hydrogel scaffolds, can be cost-effective ways to improve cartilage healing outcomes [2].
- Functionalized self-assembled peptides with hBMP7 biological activity promote the differentiation of adipose-derived stem cells (ADSCs) into nucleus pulposus-like cells [3].
- Treatment of trochlear defects with only KLD (self-assembling peptide) or only microfracture resulted in an improvement in clinical symptoms compared with no treatment [4].
- The improvement in clinical symptoms from treating defects with only KLD or only microfracture likely resulted from different causes depending on the treatment [4].
- The literature on injuries involving artificial turf is suitable for qualitative analysis only due to vast heterogeneity in factors such as level of play, sex, and definition of injury [5].
- The authors do not recommend the use of BPC-157 for sports performance and recovery because there are no randomized controlled trials investigating its use in human subjects [7].
- The science is clearly lacking to determine the overall effectiveness, safety profile, and clinical indications for BPC-157 use in sports enhancement in athletes [7].
- The critical reader uses figures in publications to guide the interpretation of study findings that are described in the text [8].
- EGYFIL, a topical lotion based on hyaluronic acid and peptides, is safe and seems to reduce pain and stiffness in patients during the 3 days of treatment [9].
- EGYFIL reduces pain and stiffness in patients already after 3 hours from the first application [9].

How It Works

- Injectable peptide therapy possesses significant therapeutic and regenerative potential [1].

- Orthopaedic and sports medicine providers currently lack sufficient evidence to support the clinical use of peptide therapies [1].
- Self-assembling peptides with hBMP7 biological activity promote the differentiation of adipose-derived stem cells (ADSCs) into nucleus pulposus-like cells [3].
- Treatment of trochlear defects with only KLD self-assembling peptide or only microfracture results in an improvement in clinical symptoms compared with no treatment [4].
- The improvement in clinical symptoms from KLD or microfracture treatment likely results from different causes depending on the specific treatment [4].
- There are no randomized controlled trials investigating the use of BPC-157 in human subjects [7].
- The science is lacking to determine the overall effectiveness, safety profile, and clinical indications for BPC-157 use in sports enhancement in athletes [7].
- The authors do not recommend the use of BPC-157 for sports performance and recovery [7].
- EGYFIL, a topical lotion based on hyaluronic acid and peptides, is safe for the treatment of pain and stiffness in soft tissues [9].
- EGYFIL reduces pain and stiffness in patients during a 3-day treatment period [9].
- EGYFIL reduces pain and stiffness already after 3 hours from the first application [9].
- BMP-7 application significantly enhances the quality of tendon-to-bone healing by promoting structural maturation [10].
- BMP-7 application significantly enhances the quality of tendon-to-bone healing by promoting functional stability [10].
- GHRP-2 administration reduced M1 macrophage polarization in a rat rotator cuff tear model [11].
- GHRP-2 administration enhanced histologic tendon-bone healing properties in a rat rotator cuff tear model [11].
- GHRP-2 administration enhanced biomechanical tendon-bone healing properties in a rat rotator cuff tear model [11].
- Axon preservation and minimal inflammation were observed in animals treated with BDNF-incorporated biofunctionalized peptide-based hydrogel [12].
- Locomotor functional recovery was not observed in animals treated with BDNF-incorporated biofunctionalized peptide-based hydrogel [12].
- The designed intervention of BDNF-incorporated hydrogel indicates potentiality for further evaluations in developing efficient therapies for severe spinal cord injury [12].

What the Evidence Shows

- Orthopaedic and sports medicine providers must understand the current lack of evidence to support the clinical use of injectable peptide therapies [1].

- The improvement in clinical symptoms from KLD or microfracture alone likely resulted from different causes depending on the treatment [4].
- Injectable therapeutic peptides are not recommended for sports performance and recovery because there are no randomized controlled trials investigating their use in human subjects [7].
- The science is lacking to determine the overall effectiveness, safety profile, and clinical indications for peptide use in sports enhancement in athletes [7].
- BMP-7 application significantly enhances the quality of tendon-to-bone healing by promoting structural maturation and functional stability in a rat rotator cuff tear model [10].
- GHRP-2 administration enhanced histologic and biomechanical tendon-bone healing properties in a rat rotator cuff tear model [11].

Practical Considerations

- The science is lacking to determine the overall effectiveness, safety profile, and clinical indications for BPC-157 in sports enhancement in athletes [7].
- The use of BPC-157 for sports performance and recovery is not recommended [7].
- Functionalized self-assembled peptides promote the differentiation of adipose-derived stem cells (ADSCs) into nucleus pulposus-like cells [3].
- Treatment of trochlear defects with only KLD (self-assembling peptide) resulted in an improvement in clinical symptoms compared with no treatment [4].
- Treatment of trochlear defects with only microfracture resulted in an improvement in clinical symptoms compared with no treatment [4].
- The improvement in clinical symptoms from KLD or microfracture treatment likely resulted from different causes depending on the treatment [4].
- EGYFIL reduces pain and stiffness in patients during the 3 days of treatment [9].

Key Evidence

- [L5] While peptide therapy may possess significant therapeutic and regenerative potential, it is critical that orthopaedic and sports medicine providers understand the current lack of evidence to support the clinical use of these peptides. [1] ([10.1177/03635465251357593](https://doi.org/10.1177/03635465251357593))
- [L5] Therapeutic strategies for microfracture augmentation, such as those presented in this study, can be cost-effective ways to improve cartilage healing outcomes. [2] ([10.1177/03635465211021798](https://doi.org/10.1177/03635465211021798))
- [L5] The functionalized self-assembled peptide promotes the differentiation of ADSCs into nucleus pulposus-like cells. [3] ([10.1186/s13018-022-03102-8](https://doi.org/10.1186/s13018-022-03102-8))
- [L5] Treatment of defects with only KLD or with only microfracture resulted in an improvement in clinical symptoms compared with no treatment; the improvement likely resulted from different causes depending on the treatment. [4] ([10.2106/jbjs.m.01408](https://doi.org/10.2106/jbjs.m.01408))

- [L4] The authors argue that the literature on injuries involving artificial turf is suitable for qualitative analysis only due to vast heterogeneity in factors such as level of play, sex, and definition of injury. [5] ([10.1177/03635465231210186](https://doi.org/10.1177/03635465231210186))
- [L5] The authors do not recommend the use of BPC-157 for sports performance and recovery because there are no randomized controlled trials investigating its use in human subjects, and the science is clearly lacking to determine the overall effectiveness, safety profile, and clinical indications for sports enhancement in athletes. [7] ([10.1016/j.arthro.2024.09.005](https://doi.org/10.1016/j.arthro.2024.09.005))
- [L5] The critical reader uses figures in publications to guide the interpretation of study findings that are described in the text. [8] ([10.1177/03635465241259467](https://doi.org/10.1177/03635465241259467))
- [L4] EGYFIL is safe and seems to reduce pain and stiffness in patients during the 3 days of treatment, already after 3 h from the first application. [9] ([10.1186/s12891-023-06903-y](https://doi.org/10.1186/s12891-023-06903-y))
- [L5] BMP-7 application significantly enhances the quality of tendon-to-bone healing by promoting structural maturation and functional stability. [10] ([10.1016/j.jse.2026.04.003](https://doi.org/10.1016/j.jse.2026.04.003))
- [L5] GHRP-2 administration reduced M1 macrophage polarization and enhanced histologic and biomechanical tendon-bone healing properties in a rat rotator cuff tear model. [11] ([10.1016/j.arthro.2024.11.094](https://doi.org/10.1016/j.arthro.2024.11.094))
- [L5] Although locomotor functional recovery was not observed, axon preservation and minimal inflammation in animals treated with BDNF-incorporated hydrogel indicate the potentiality of the designed intervention for further evaluations in the path of developing efficient therapies for severe spinal cord injury. [12] ([10.1016/j.injury.2018.12.027](https://doi.org/10.1016/j.injury.2018.12.027))

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