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Basic Study

Proliferation and tenogenic differentiation of BMSCs in a porous collagen sponge scaffold

BMSCs in collagen sponge

Bingyu Zhang, Pu Xu, Qing Luo, Guanbin Song

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The results demonstrated that the **collagen-based scaffold** could promote the adhesion, **proliferation** and osteogenic **differentiation of BMSCs** in comparison with the non-**collagen scaffold**. This 3D **scaffold** system provides a general strategy for fabricating **collagen-based scaffolds**, which can be used as 3D scaffolds in bone tissue engineering.

Cited by: 1

Author: Tingting Zhang, Tingting Zhang, Hong Che...

Publish Year: 2019

TENOGENIC DIFFERENTIATION OF HUMAN MSCs INDUCED BY ...

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3279298>

It is likely that the **effect of collagen orientation on tenogenic differentiation was more dominant and masked the ability of BMP-12 to induce such differentiation**. It is possible that the protocol developed by Lee et al. may be optimal for the tenogenic differentiation of rat MSCs on random collagen sponge scaffolds, but not necessarily on human MSCs on oriented collagen matrices.

Cited by: 165

Author: Vipul Kishore, Whitney Bullock, Xuanhao S...

Publish Year: 2012

Current concepts on tenogenic differentiation and clinical ...

<https://www.sciencedirect.com/science/article/pii/S2214031X16302996>

Apr 01, 2017 · In in vitro studies, the role of GDFs in **tenogenic differentiation** was well summarized by Lui et al and is not shown in detail in Table 1 except for new studies. The mechanisms of GDFs on promoting **tenogenic differentiation** may be caused by activating cytoskeleton reorganization signalling (stress fibre formation) or activating the Smad1/5/8 signalling pathway .

Cited by: 12

Author: Yang Liu, Chun-Wai Suen, Jin-fang Zhang, ...

Publish Year: 2017

Stepwise Differentiation of Mesenchymal Stem Cells ...

<https://stemcells.journals.onlinelibrary.wiley.com/doi/full/10.5966/sctm.2015-0215>

The present study sought to investigate a reliable method to enhance **tenogenic differentiation of BMSCs** and generate functional neotendon tissue in vivo. First, three potential **tenogenic factors**, TGF- β 1, BMP12, and CTGF, were chosen to evaluate their single or combined use on **tenogenic differentiation of BMSCs**.

Cited by: 52

Author: Zi Yin, Zi Yin, Jia Guo, Tian-yi Wu, Xiao Che...

Publish Year: 2016

Stepwise Differentiation of Mesenchymal Stem Cells ...

<https://stemcells.journals.onlinelibrary.wiley.com/doi/abs/10.5966/sctm.2015-0215>

Hence, a stepwise **tenogenic differentiation** approach was established by first using TGF- β 1 stimulation

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Osteogenic differentiation of BMSCs in collagen-based 3D ...

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The results demonstrated that the **collagen-based scaffold** could promote the adhesion, **proliferation** and osteogenic **differentiation of BMSCs** in comparison with the non-**collagen scaffold**. This 3D **scaffold** system provides a general strategy for fabricating **collagen-based scaffolds**, which can be used as 3D scaffolds in bone tissue engineering.

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Author: Tingting Zhang, Tingting Zhang, Hong Che...

Publish Year: 2019

Construction of tendon replacement tissue based on ...

<https://pubmed.ncbi.nlm.nih.gov/29702290>

In this study, we developed a three-dimensional (3D) culture system based on a silicone chamber and **collagen sponge scaffold** that can deliver cyclic mechanical stretch and biochemical stimulation to bone marrow-derived mesenchymal stem cells (**BMSCs**) seeded on the **scaffold**.

Cited by: 8

Author: Bingyu Zhang, Qing Luo, Bin Deng, Yasuyuk...

Publish Year: 2018

Bone morphogenetic protein-12 inducing tenogenic ...

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[Proliferation and differentiation of mesenchymal stem ...](#)

<https://onlinelibrary.wiley.com/doi/full/10.1111/cpr.12408>

Nov 21, 2017 · The cytocompatibility of these scaffolds with mouse **mesenchymal stem cells** (mMSCs, C3H10T1/2) was determined by MTT assay and fluorescence staining. **Cell proliferation** on scaffolds was assessed using MUSE™ (Merck-Millipore, Germany) **cell** analyser. The effect of scaffolds on osteoblast **differentiation** at the cellular level was evaluated by ...

Cited by: 54

Author: S. Dhivya, A. Keshav Narayan, R. Logith Ku...

Publish Year: 2018

[Differentiation of Bone Marrow Mesenchymal Stem Cells into ...](#)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6457308>

Bone marrow mesenchymal stem cells (BMSCs) originating from **bone marrow** are regarded as the best candidates for **cell** replacement. They have advantages including ease of isolation, strong **proliferation** capacity, and immunological naivety, and there are no ethical issues concerning their use 6.

Cited by: 3

Author: Manli Li, Wen Zhao, Yudan Gao, Peng Hao, ...

Publish Year: 2019

[Different combinations of growth factors for the tenogenic ...](#)

<https://www.ncbi.nlm.nih.gov/pubmed/28319735>

Thanks to the high proliferation and multi-lineage differentiation capability, bone marrow-derived mesenchymal stem cells (BMSCs) are **a promising cell source to support the tendon repair**. To date, the association of various growth factors to induce the in vitro tenogenic differentiation of multipotent progenitor cells is poorly investigated.

Cited by: 16

Author: Marta Bottagisio, Silvia Lopa, Valentina Gra...

Publish Year: 2017

[Differentiation of Bone Marrow Mesenchymal Stem Cells into ...](#)

<https://www.hindawi.com/journals/bmri/2019/5086297> ▼

Bone marrow mesenchymal stem cells undergo **differentiation** to different lineages with different efficiencies when induced by different factors. We added a bFGF-chitosan controlled release system (bFGF-CCRS) as an inducer into conditioned medium to facilitate the oriented **differentiation** of BMSCs into neural lineage **cells** (eventually mature neurons); furthermore, we synchronized BMSCs to the G0