

16

Name of Journal: *World Journal of Stem Cells***Manuscript NO:** 55000**Manuscript type:** REVIEW**Human hair follicle-derived mesenchymal stem cells: Isolation, expansion, and differentiation**Wang B *et al.* Hair follicle MSCs

Bo Wang, Xiao-Mei Liu, Zi-Nan Liu, Yuan Wang, Xing Han, Ao-Bo Lian, Ying Mu, Ming-Hua Jin, Jin-Yu Liu

Abstract

Hair follicles are easily accessible skin appendages that protect against cold and potential injuries. Hair follicles contain various pools of stem cells, such as epithelial, melanocyte, and mesenchymal stem cells (MSCs) that continuously self-renew, differentiate, regulate hair growth, and maintain skin homeostasis.

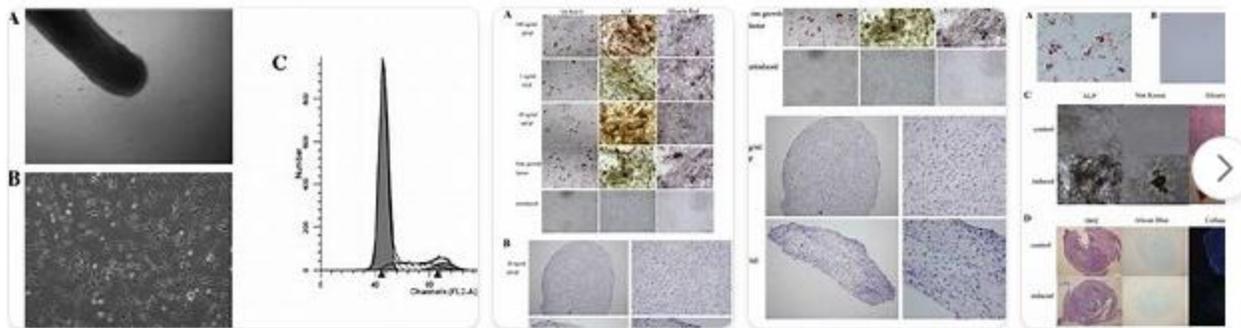
Match Overview

Rank	Source	Words	Similarity
1	Internet	64 words crawled on 16-Jun-2019 www.liebertpub.com	2%
2	Internet	58 words crawled on 17-Mar-2010 cardiovascres.oxfordjournals.org	2%
3	Internet	51 words crawled on 11-Mar-2016 www.spandidos-publications.com	1%
4	Crossref	46 words Helena Topouzi, Niall J. Logan, Greg Williams, Claire A. Higgins. "Methods for the isolation and 3D culture of derm ..."	1%
5	Internet	43 words crawled on 08-May-2020 www.hindawi.com	1%
6	Internet	33 words crawled on 30-Aug-2019 academic.oup.com	1%
7	Crossref	32 words Feilin Liu, Jiahong Shi, Yingyao Zhang, Aobo Lian et al. "N ANOG Attenuates Hair Follicle-Derived Mesenchymal Ste"	1%
8	Crossref	27 words Dongrui Ma, Jonah Ee Hsiang Kua, Wee Keng Lim, Seng T eik Lee, Alvin Wen Choong Chua. "In vitro characterization"	1%
9	Crossref	25 words Cremonesi, F.. "Fetal adnexa derived stem cells from do... estic animal: progress and perspectives", <i>Theriogenology</i> ,	1%
10	Crossref	24 words Pengdong Li, Feilin Liu, Chunling Wu, Wenyue Jiang et al. "Feasibility of human hair follicle-derived mesenchymal s ..."	1%
11	Crossref	20 words Bajpai, V.K.. "Clonal multipotency and effect of long-term i n vitro expansion on differentiation potential of human h ..."	1%
12	Crossref	15 words	<1%



Images of human hair follicle-derived mesenchymal ste...

bing.com/images



See more images of human hair follicle-derived mesenchymal stem cells Isolation, Expansion, and differentiation

Hair Follicle Stem Cell Isolation and Expansion

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6017999>

May 20, 2018 - The protocol described below details the **isolation** and **expansion** of these cells for eventual clinical application. We used a dual-reporter mouse model to visualize both **isolation** and eventual **differentiation** of these cells in a limbal stem cell-deficient mouse model. ... The **hair** follicle contains **mesenchymal stem cells** in the dermal papilla ...

Cited by: 1

Author: Mindy Call, Ewa Meyer, Winston Kao, Fri...

Publish Year: 2018

(PDF) Hair Follicle Stem Cell Isolation and Expansion

<https://www.researchgate.net/publication/325267771...>

The protocol described below details the **isolation** and **expansion** of these cells for eventual clinical application. ... Hair Follicle Derived Stem Cell ... for determining **stem cell differentiation**

Isolation and Culture of Hair Follicle Dermal Sheath ...

<https://www.ncbi.nlm.nih.gov/pubmed/31148078>

To date, little is published on the characterization and therapeutic potential of **human mesenchymal stromal cells** (MSCs) derived from **hair** follicle dermal sheath (DS). We present protocols for the **isolation** and culture of **human** DS-MSCs starting with the use of a dissecting microscope to separate

Human hair follicle-derived mesenchymal stem cells: Is



ALL

IMAGES

VIDEOS

68,100 Results

Any time ▾

Hair Follicle Stem Cell Isolation and Expansion

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6017999>

May 20, 2018 · The **hair** follicle contains **mesenchymal stem cells** in the dermal papilla and connective tissue sheath, ... **B. Isolation** of **hair** follicle-derived **stem cells**. ... A detailed analysis of the **isolation** and clonal **expansion** of the **hair** follicle **stem cells** can be found at Blazejewska et al., 2009. (*Stem Cells* 2009 27(3):642–652)

Cited by: 1

Author: Mindy Call, Ewa Meyer, Winston Kao, Fr...

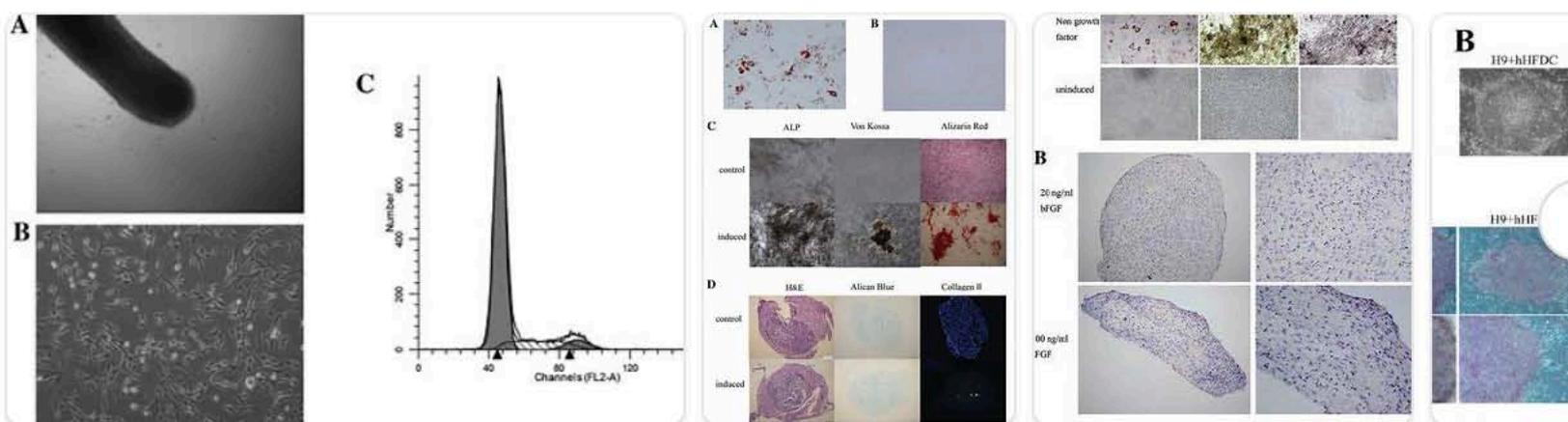
Publish Year: 2018

(PDF) Hair Follicle Stem Cell Isolation and Expansion

https://www.researchgate.net/.../325267771_Hair_Follicle_Stem_Cell_Isolation_and_Expansion

Stem cells are widely used for numerous clinical applications including limbal **stem cell** deficiency. **Stem cell** derived from the bulge region of the **hair** follicle have the ability to differentiate ...

Images of human hair follicle-derived mesenchymal stem cells Isolat...

<bing.com/images>

See more images of human hair follicle-derived mesenchymal stem cells Isolation, Expansion, and Differentiation

Isolation and Culture of Hair Follicle Dermal Sheath



Human hair follicle-derived mesenchymal stem cells: Isol



ALL

IMAGES

VIDEOS

MAPS

NEWS

SHOPPING

68,300 Results

Any time ▾

[Hair Follicle Stem Cell Isolation and Expansion](#)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6017999>

May 20, 2018 · **Hair follicle stem cells** are being studied as a valuable source of **autologous stem cells** to treat disease. The protocol described below details the **isolation and expansion** of these **cells** for **eventual clinical application**.

Cited by: 1

Author: Mindy Call, Ewa Meyer, Winston Kao, Fri...

Publish Year: 2018

[Isolation, expansion and neural differentiation of stem ...](#)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5023559>

However, cultures containing **fibroblasts** will soon be overgrown by this **contaminating cell** type, for the doubling time of **human dermal fibroblasts** is in general 24 h, while the **hair follicle bulge stem cells** have a doubling time of an average of 3.3 days (see also "Results", **section Expansion** and cryopreservation). **Fibroblasts** will thus overgrow the other **cells** and form arrays of **cells** oriented in ...

Cited by: 7

Author: Coen G. Gho, Timo Schomann, Simon C....

Publish Year: 2016

[Isolation and Culture of Hair Follicle Dermal Sheath ...](#)

https://link.springer.com/protocol/10.1007/978-1-4939-9473-1_5

May 31, 2019 · Hair follicle Dermal sheath **Mesenchymal stromal cells** MSCs Adipogenic **differentiation** Osteogenic **differentiation** Chondrogenic **differentiation** **Stem cells** Tissue engineering This is a preview of subscription content, log in to check access.

Author: Dongrui Ma, Seng-Teik Lee, Alvin We...

Publish Year: 2019

[NANOG Attenuates Hair Follicle-Derived Mesenchymal Stem ...](#)

<https://www.hindawi.com/journals/omcl/2019/4286213>

Stem cells derived from elderly donors or harvested by repeated subculture exhibit a marked decrease in proliferative capacity and multipotency, which not only compromises their therapeutic potential but also raises safety concerns for regenerative medicine. NANOG—a well-known core transcription factor—plays an important role in maintaining the self-renewal and pluripotency of **stem cells**.