Subject: Erzeugung von "Epithelial Stem Cells" und "DP cells" --> Aussichten?
Posted by mexo on Sun, 09 Mar 2014 19:04:22 GMT
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Zuletzt sind zwei sehr interessante Artikel zum Thema Haarmultiplikation erschienen (auch bereits in anderen Threads erwähnt).
Zum Züchten neuer Haarfolikel braucht man laut Artikel 1 (siehe unten) zwei Sorten von Zellen, "Epithelial Stem Cells" und "DP cells".
Artikel 1 beschreibt nun das erfolgreiche Erzeugen des ersten Zelltyps (leider nur an Mäusen...), weißt aber darauf hin, dass noch das Erzeugen eines zweiten Zelltyps nötig sei, was aber noch niemandem gelungen ist.
Artikel 2 setzt hier ein und beschreibt, dass es mittlerweile sogar 3 Forschergruppen geschafft haben, diesen zweiten Zelltyp zu bilden.

Wie sind diese Ergebnisse einzuordnen?
Wie sähe eine Behandlung aus, die darauf basiert? Was wäre noch alles nötig?
Was darf man hier erwarten und wann?
Ist das der Weg zum "Cure"?

Mir fehlt hier das fachliche Verständnis.
Mich interessieren hier eigentlich nur die Meinungen der fachlich kompetenten Nutzer (und die von umbekannteren Usern, die ihre Antworten gut belegen können). Die anderen Antworten werde ich überlesen...

Schlecht finde ich, dass es mit den "Epithelial Stem Cells" nur bei Mäusen klappt und noch nicht beim Menschen.

Quellen:

Artikel 1 (Epithelial Stem Cells):

Link:
http://www.sciencedaily.com/releases/2014/01/140128094141.htm

Auszug:
"This is the first time anyone has made scalable amounts of epithelial stem cells that are capable of generating the epithelial component of hair follicles," Xu says. And those cells have many potential applications, he adds, including wound healing, cosmetics, and hair regeneration.
That said, iPSC-derived epithelial stem cells are not yet ready for use in human subjects, Xu adds. First, a hair follicle contains epithelial cells -- a cell type that lines the body's vessels and cavities -- as well as a specific kind of adult stem cell called dermal papillae. Xu and his team mixed iPSC-derived EpSCs and mouse dermal cells to generate hair follicles to achieve the growth of the follicles.

"When a person loses hair, they lose both types of cells." Xu explains. "We have solved one major problem, the epithelial component of the hair follicle. We need to figure out a way to also make new dermal papillae cells, and no one has figured that part out yet."
What's more, the process Xu used to create iPSCs involves genetic modification of human cells

with genes encoding oncogenic proteins and so needs more refinement. Still, he notes that stem-cell researchers are developing more workarounds, including strategies using only chemical agents.

Artikel 2 (DP cells):

Link:
http://online.liebertpub.com/doi/abs/10.1089/ten.TEA.2013.0547
Link zu einem Thread in einem US-Forum über den Artikel:
http://www.baldtruthtalk.com/showthread.php?p=167288#post167288

Auszug:
The scientists @ Nanfang Hospital of Southern Medical University in China just published this article. They confirmed that the expression of several genes and proteins associated with hair follicle inductivity of DP cells, such as NCAM, Versican and ?-SMA were maintained using this 3D Matrigel Culturing Method.

THREE DIFFERENT TEAMS FROM ALL OVER THE WORLD HAVE MANAGED TO CRACK THIS ISSUE IN THE LAST 3 MONTHS Jahoda/Christiano, Taiwan Uni & Now the Chinese. We are so close Here's the abstract:

Controllable production of transplantable adult human high-passage dermal papilla spheroids using 3D Matrigel culture

We have succeeded in culturing human dermal papilla (DP) cells spheroids and developed a three-dimensional Matrigel (basement membrane matrix) culture technique that can enhance and restores DP cells unique characteristics in vitro.

When 10000 DP cells were cultured on the 96 well plates pre-coated with Matrigel for 5 days, both passage 2 and passage 8 DP cells formed spheroidal microtissues with a diameter of 150-250 um in an aggregative and proliferative manner. We transferred and re-cultured these DP spheroids onto commercial plates. Cells within DP spheres could disaggregate and migrate out, which was similar to primary DP. Moreover, we examined the expression of several genes and proteins associated with hair follicle inductivity of DP cells, such as NCAM, Versican and ?-SMA, and confirmed that their expression level was elevated in the spheres compared with the dissociated DP cells. To examine hair-inducing ability of DP spheres, hair germinal matrix cells and DP spheres were mixed and cultured on Matrigel. Unlike the dissociated DP cells and hair germinal matrix cells co-cultured in two dimensions, hair germinal matrix cells can differentiate into hair-like fibers under the induction of the DP spheres made from the high passage cells (passage in vitro.

We are the first to show that passage 3 human hair germinal matrix cells differentiate into hair-like fiber in the presence of human DP spheroids.

These results suggest that three-dimensional Matrigel culture technique is an ideal culture model for forming DP spheroids and that sphere formation partially models the intact DP, resulting in hair induction, even by high passage DP cells.