



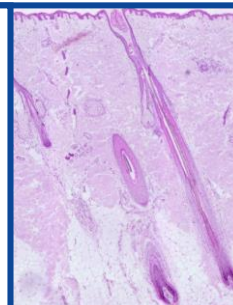
**MONASTERIUM
LABORATORY**

A **Q I M A** Life Sciences Company

*All about
skin and hair
bioscience!*

**State-of-the-art technology and expertise
for all your pre-clinical, mechanistic, and
clinical needs in dermatology research.**

- ▶ Pre-clinical Research
- ▶ Clinical Research
- ▶ Education



Inflammatory and non-inflammatory mediated itch/pruritus



"We combine
our unique expertise,
our project design creativity,
and our passion to advance
our clients' success in
delivering novel and game-
changing skin and hair
research solutions"

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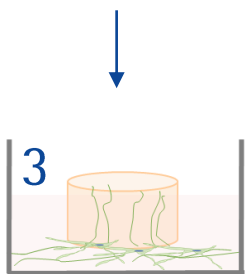
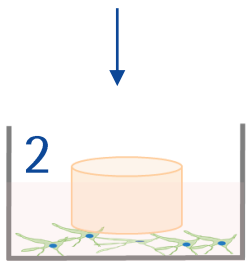
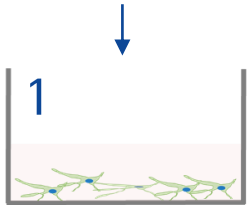
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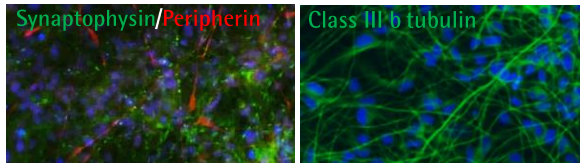


Sensory Re-innervation of Human Skin by Human Neural Stem Cell-Derived Peripheral Neurons *ex vivo*

Our workflow:



1. Differentiation of human iPSC derived neural stem cells *in vitro*

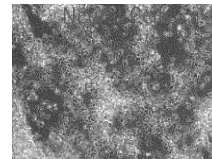


Human iPSC derived neural stem cells start to express: **class III β -tubulin** which is associated with neuronal maturation and is a microtubule element of the tubulin family found almost exclusively in neurons and neurite extensions (Sainath and Gallo, Cell Tissue Res 2015), **peripherin** which is a peripheral nervous system neuronal marker (Yuan et al., J Neurosci. 2012), and **synaptophysin** which is a marker of mature neurons (Kwon et al., Neuron. 2011)

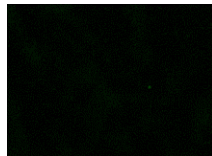
Animal-free model!

A NEW pre-clinical assay for testing the effects of drugs on innervated skin *ex vivo*

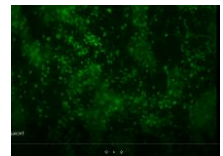
Fully differentiated human iPSC-Derived



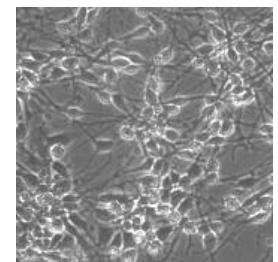
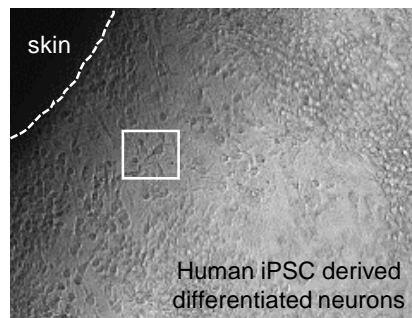
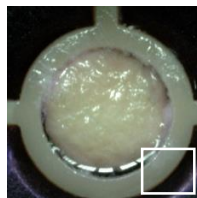
Unstimulated cells



Capsaicin stimulated cells

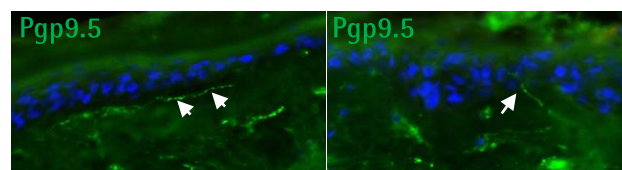


2. Initiation of co-culture of human skin with human differentiated iPSC derived neural stem cells *ex vivo*

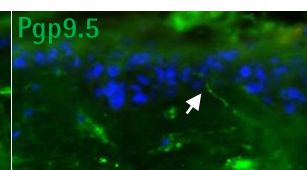


Topical application possible

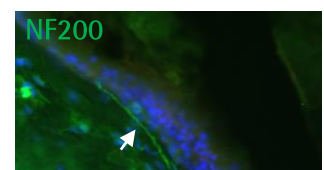
Chéret et al., J Invest Dermatol 2021



nerve fibers (PGP9.5+) reaching the epidermis



nerve fibers (Pgp9.5+) entering into the epidermis

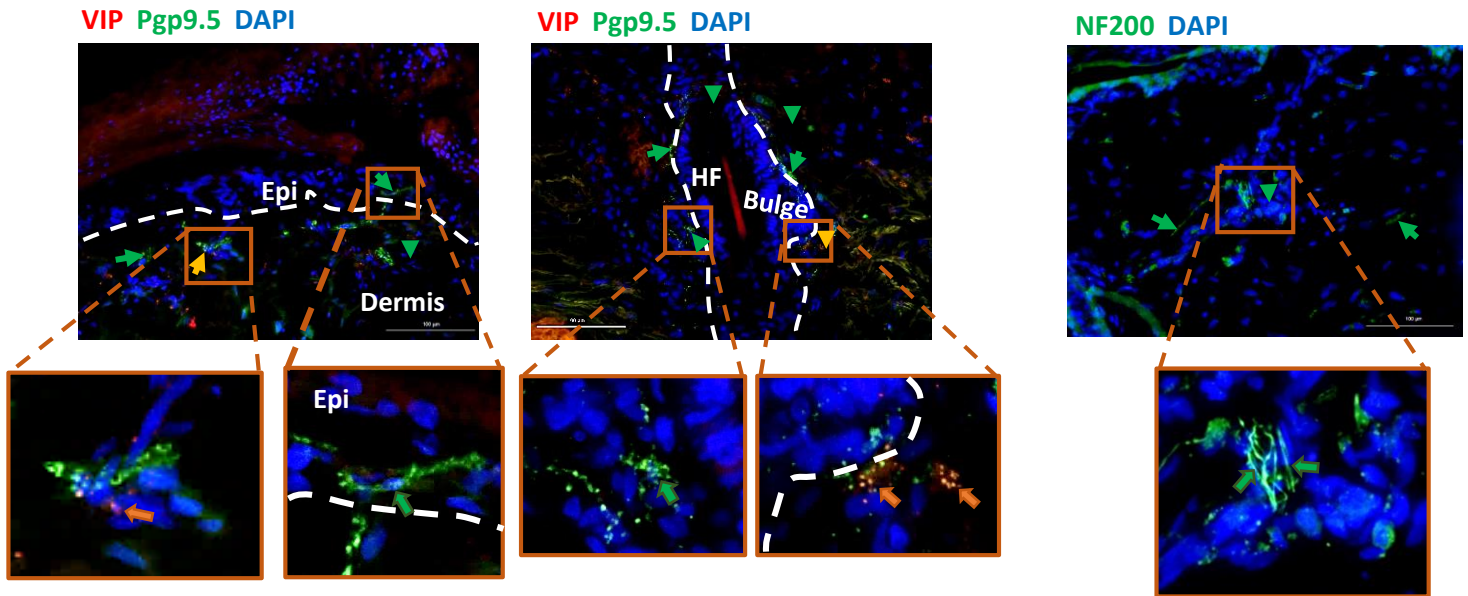


myelinated (NF200+) nerve fibers along the hair follicles

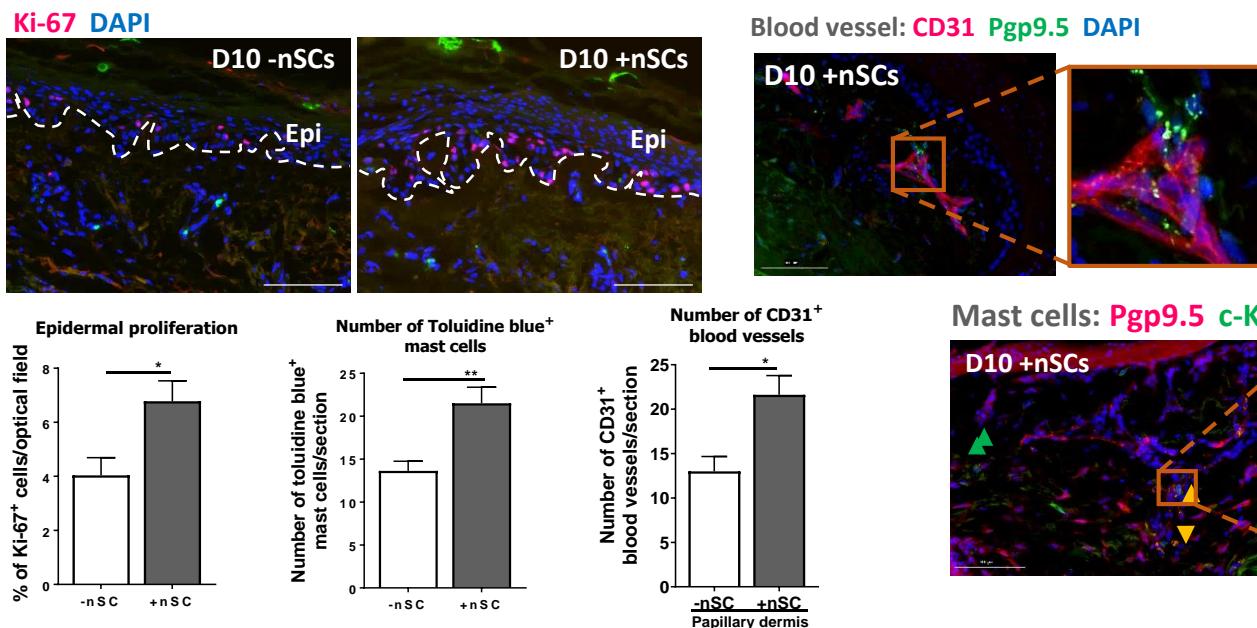
INSTEAD: No remaining nerve fibers can be detected in human skin cultured *ex vivo* in the absence of human iPSC derived neural stem cells

Sensory Re-innervation of Human Skin by Human Neural Stem Cell-Derived Peripheral Neurons *ex vivo*

Presence of peptidergic and myelinated sensory fibers after re-innervation



Enhanced skin survival and prolonged organ culture conditions, and close contact between nerve fibers and skin cells

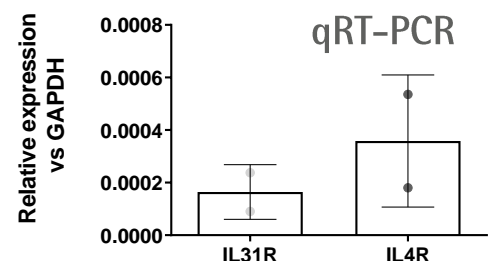


Ch ret et al., J Invest Dermatol 2021

This novel assay can be combined with other disease models *ex vivo* (e.g. stimulation with IL-4 and IL-13 for mimicking atopic dermatitis) and can be utilized for dissecting and manipulating the bi-directional communication between defined skin and hair follicle cell populations and (sensory) human nerve fibers under stringently controlled *ex vivo* conditions, or for testing drugs that target the cross-talk between human skin, hair follicles and cutaneous nerve fibers.

Relevant for e.g. sensitive skin, itch, atopic dermatitis, psoriasis

Differentiated human iPSC-derived Neural Stem Cells (nSCs) also express *IL4R* and *IL31R*, and other itch-relevant markers



WHY US?



**MONASTERIUM
LABORATORY**

A **Q I M A** Life Sciences Company

Our vision is

to provide our clients and partners with the highest quality research in investigative dermatology and trichology – from basic science to translational applied and contract research of high relevance for clinical applications.

Great network of dermatologists and plastic surgeons collecting samples from healthy and diseased skin

World-class scientific leadership & international team

Clinically-relevant *ex vivo* and *in vivo* models

Strong academic background & publication record

What we can do for our clients:

- Conceptualize & build proof-of-concept studies
- Carry out full service portfolio for pre-clinical skin & hair research (*in vitro/ex vivo* assays, and humanized mouse models)
- Investigate side effects in the skin or hair follicle
- Establish novel cutting edge methodologies and techniques
- Design tailor-made & customized assays for all needs
- Identify, characterize, or validate novel targets and therapeutics for skin & hair disorders
- Discover mechanistic action stories, biomarkers & predictors of response
- Conduct investigator initiated skin & hair clinical trials
- Provide access to human healthy & diseased skin and hair specimen
- Prepare comprehensive project reports & manuscript drafts

Our ambition is to establish and refine research techniques:
Advanced Methodology Program

Global client list & testimonials

Investigative dermatology:
Acne Vulgaris, Atopic Dermatitis, Psoriasis, Alopecia Areata, Androgenic Alopecia, Hidradenitis Suppurativa, Vitiligo, Chronic Itch, Prurigo Nodularis, etc.

Biobank:
Full access to skin & hair samples (patients & healthy subjects)

Exceptional state-of-the-art research technology

We are supported by world-wide recognized experts in dermatology