Human stem cell derived sensory neurons

Commonly used acronym: *hSCDS neurons*

Created on: 27-02-2020 - Last modified on: 28-02-2020

Organisation

Name of the organisation Katholieke Universiteit Leuven (KUL)
Department Cellular and molecular medicine
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Country Belgium
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Department Stem cell institute
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Name of the organisation VIB - KU Leuven
Department Center for Brain & Disease Research
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SCOPE OF THE METHOD

The Method relates to	Human health
The Method is situated in	Basic Research
Type of method	In vitro - Ex vivo
Specify the type of cells/tissues/organs	Starting from human embryonic stem cells to sensory neurons with a nociceptor phenotype

DESCRIPTION

Method keywords

Stem cell differentiation

Scientific area keywords

human sensory neurons

Method description

We use stem cell-derived sensory neurons and via a small molecule-based protocol (*Young et al, 2014*) we derive them into human sensory neurons with a nociceptor phenotype (express somatosensory ion channels).

Lab equipment

Cell culture.

Method status

Still in development
Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

One of the only available methods to have easy and accessible human sensory neurons.

Challenges

You work with artifical cells.
Differentiation protocol can vary and give variability.

Modifications

Yes, optimalization of the protocol to obtain less variability, more research into what type of neurons you obtain, and more protocols to other types of neurons.
Differentiation in the presence of other neuronal cell types might give a more natural environment and result.

Future & Other applications

Mutating the initial stem cells might give information about neuronal development.
Adding genetic fluorescent proteins can give information about expression at different time points and locations.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

The protocol is based on :
- Chambers et al, nat biotech, 2012 ;
- Young et al, mol ther, 2014.

And was later optimized by the stem cell institute @ KU Leuven.
References that use the protocol (for different research purposes):
- Desiderio et al, cell rep, 2019 ;
- Vangeel et al, JBP, 2020.

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Financed by