

Human choroid plexus organoids

Commonly used acronym: ChP organoids

Created on: 31-01-2025 - Last modified on: 08-09-2025

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Organisation

Name of the organisation Vlaams Instituut voor Biotechnologie (VIB)

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Specific Research Group or Service Barriers in inflammation lab

Country Belgium

Geographical Area Flemish Region

Name of the organisation Ghent University (UGent)

Department Biomedical molecular biology

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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	Induced pluripotent stemcells / embryonic stemcells

DESCRIPTION

Method keywords

matrigel
human embryonic stem cell derived organoid model
Human induced Pluripotent Stem Cell
HUman brain organoids

Scientific area keywords

choroid plexus
blood-csf barrier
brain delivery
csf

Method description

ChP organoids are produced starting from human induced pluripotent or embryonic stem cells. 7 days after seeding of the stem cells, the organoids are embedded in matrigel. After 30-40 days, the organoids are differentiated and form a functional blood-CSF barrier with fluid-filled cysts resembling human CSF. This method has first been described and published by Laura Pellegrini (2020).

Lab equipment

- Shaker in incubator with 5% CO₂ at 37°C,
- General cell culture equipment and flows.

Method status

Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

This system can be more relevant to study the human choroid plexus and CSF in comparison to the use of other *in vitro* models with immortalized cells. The organoids produce a CSF-like fluid, enabling study of CSF production and composition in a much less invasive and difficult way compared to the use of mice.

Challenges

The long culturing time is a downside. Additionally, there might be variability between different batches, influence of the batch of matrigel or other components used during culturing, and there is a big impact of the cell type that is used.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Laura Pellegrini et al. ,Human CNS barrier-forming organoids with cerebrospinal fluid production. Science369,eaaz5626(2020). DOI:10.1126/science.aaz5626
<https://www.stemcell.com/stemdiff-choroid-plexus-organoid-differentiation-kit.html>

Associated documents

[Publication from Laura Pellegrini.pdf](#)
[Protocol ChP organoids from stemcell technologies kit.pdf](#)

Links

[Human CNS barrier-forming organoids with cerebrospinal fluid production, L. Pel...](#)

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