



3D *IN VITRO* MODEL OF THE BLOOD-BRAIN BARRIER

Human biology-on-a-chip • Simplified



AIM Biotech offers an easy-to-use, modular platform for incorporating 3D cell culture into your neurovascular unit research.



The organization of the all-human cells i.e., human primary endothelial cells (EC), brain pericytes (PC) and astrocytes (AC) into a microvascular network within a fibrin gel giving rise to a 3D BBB. Users have the flexibility to perform both real time tracking and endpoint screening of brain-targeting drugs, drug-induced toxicity, inflammation and many more.

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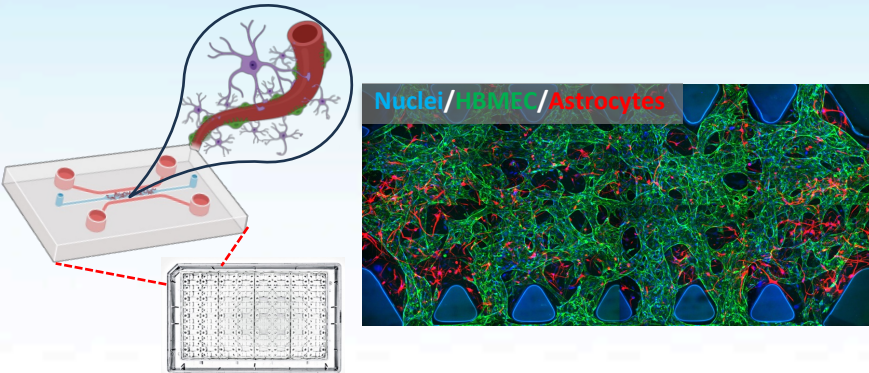
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3D BBB Model

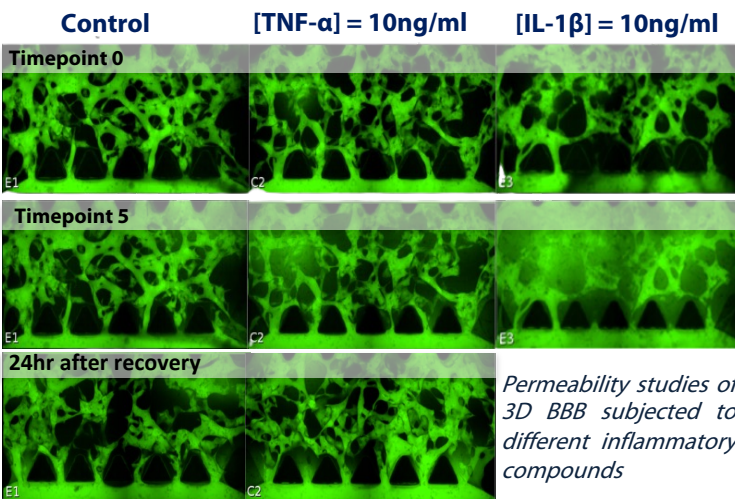
AIM 3D Cell Culture Chips offer a new perspective on the study of the BBB.



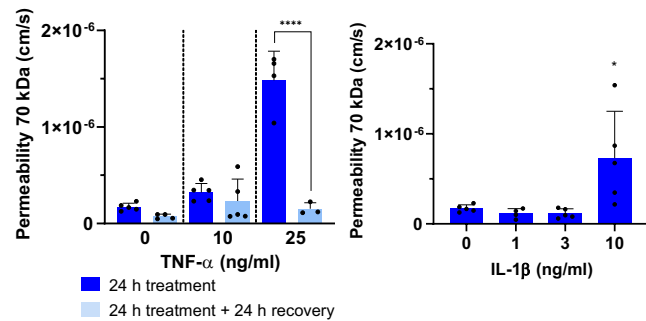
Schematic of 3D BBB present in each site of idenTX40 plate;
Immunofluorescence staining of the 3D BBB

- Self-organization of the cells into 3D matrix
- Positive signals identified for specific brain cell types
- Live-cell as well as fixed cell staining
- Disease-modelling of neurological dysfunctions

— Permeability Studies —

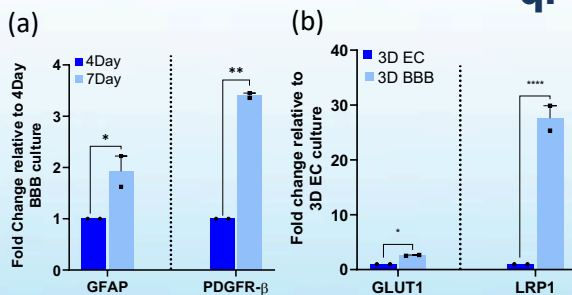


Permeability studies of 3D BBB subjected to different inflammatory compounds



- Low permeability values = tight 3D BBB model
- Perturbed BBB recovered post treatment with inflammatory cues
- Presence of interstitial flow which is useful for studying (drug-induced) toxicity, inflammation, quantification of drug transport into the CNS.

— qPCR of BBB biomarkers —



qPCR data of some markers in the 3D BBB: (a) AC & PC markers in 4Day vs 7Day BBB; (b) Transporters identified in BBB

- Off-plate analysis of RNA, DNA etc. can be conducted with qPCR analysis
- BBB specific biomarkers are identified
- EC transporters e.g., Pgp, ABCG2, MRP4 identified

References

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- [3] Hajal C., Offenddu GS., Shin Y., Zhang S., Morozova O., Hickman D., Knutson CG., Kamm RD.; Nat Prot, 2022, 17, 125-128
- [4] Campisi M, Shin YJ, Osaki T, Hajal C, Chiono V, Kamm RD.; Biomat. 2018, 180, 117-119