# 3D NEUROPROTECTION ASSESSMENT AGAINST PARKINSON'S DISEASE

More than 92% of drug candidates for Central Nervous System diseases fail in clinical trials. HCS Pharma has developed human 3D cellular model including the matricial microenvironment, in the aim to better select drug candidates. This model is available for High Content Screening on our Robotic Platform.

Parkinson's disease affect more than 10 million people worldwide. This disease is mainly characterized by movement symptoms, cause by the death of dopaminergic neurons. This neuronal death involves the cellular and matricial microenvironments, in particular in neuroinflammatory processes.
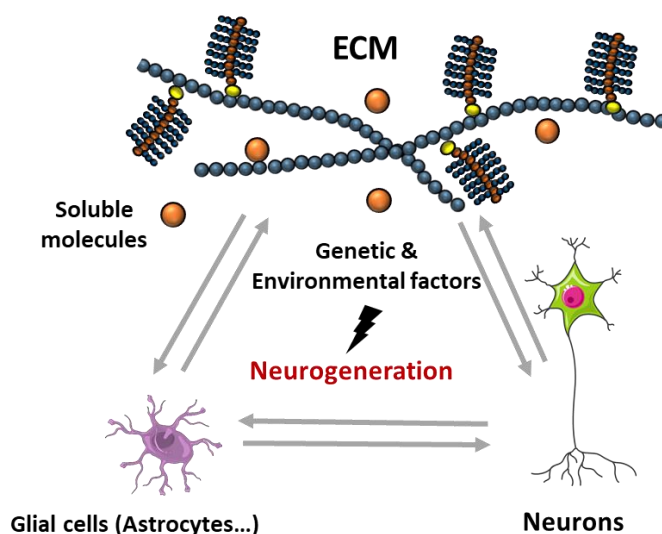
BIOMIMESYS® *Brain hydroscaffold™* is a hyaluronic acid-based matrix, grafted with structural and adhesion molecules, which mimics the extracellular matrix. It allows to culture cells in 3D in a relevant microenvironnement. In this matrix, dopaminergic neuronal cell line form clusters with neurites (β-3-tubulin), and express neuronal maturity marker (NeuN) and dopaminergic neuron marker (tyrosin hydroxylase):

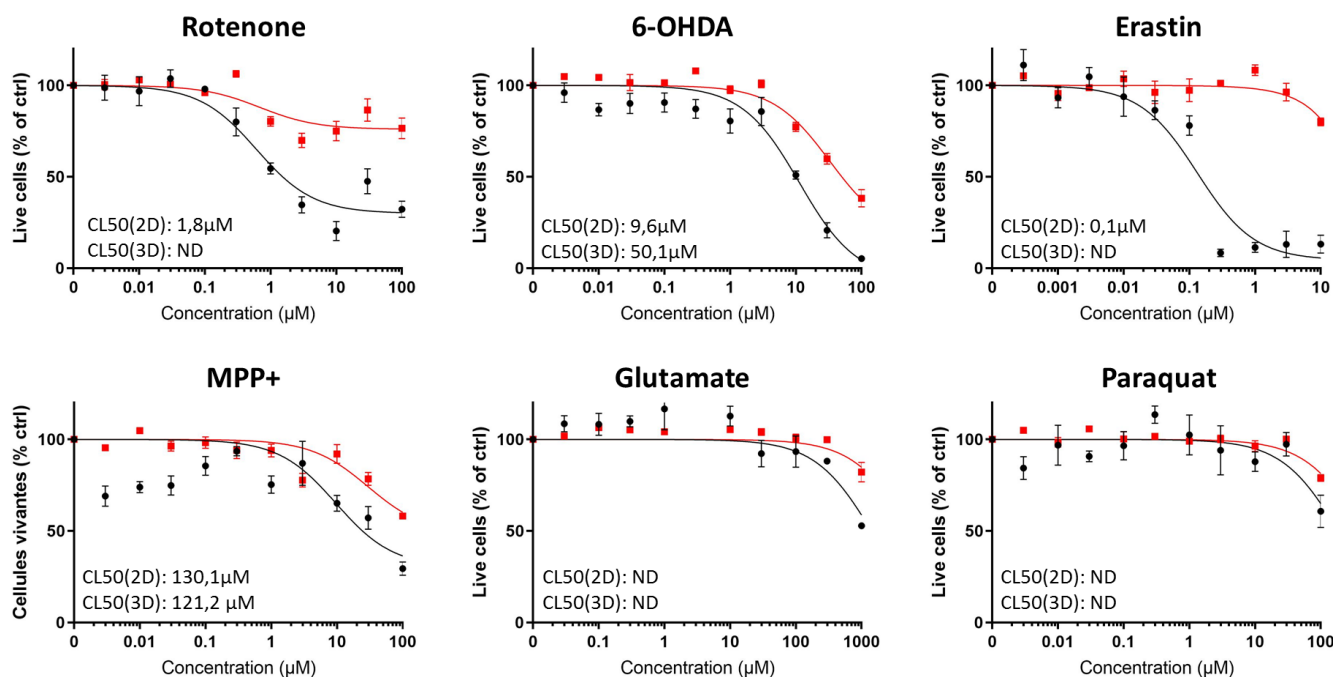**Dopaminergic neuronal cell line in 3D in** BioMIMESYS® Brain

β-3-tubulin | NeuN | Tyrosin Hydroxylase

200µm
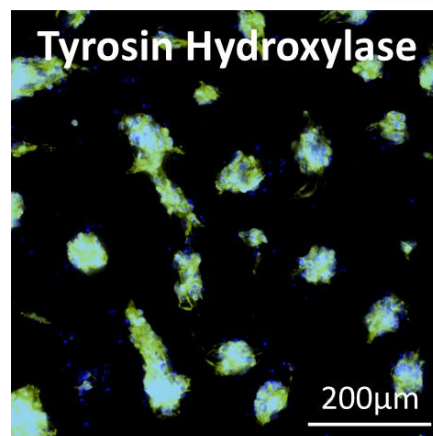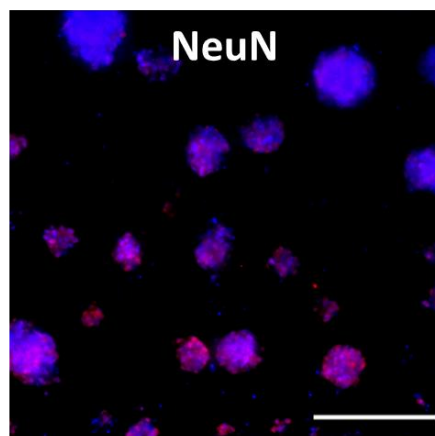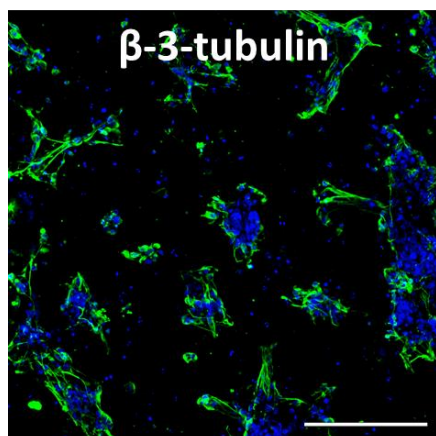
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The exposition of dopaminergic neurons to Parkinson's disease inducers leads to cell mortality in BIOMIMESYS® *Brain*, with a shift in the Lethal Concentration 50% (LC50%) compared to 2D culture:

Rotenone
Live cells (% of ctrl)
CL50(2D): 1,8µM
CL50(3D): ND
Concentration (µM)

6-OHDA
Live cells (% of ctrl)
CL50(2D): 9,6µM
CL50(3D): 50,1µM
Concentration (µM)

Erastin
Live cells (% of ctrl)
CL50(2D): 0,1µM
CL50(3D): ND
Concentration (µM)

MPP+
Cellules vivantes (% ctrl)
CL50(2D): 130,1µM
CL50(3D): 121,2 µM
Concentration (µM)

Glutamate
Live cells (% of ctrl)
CL50(2D): ND
CL50(3D): ND
Concentration (µM)

Paraquat
Live cells (% of ctrl)
CL50(2D): ND
CL50(3D): ND
Concentration (µM)

The astrocytes' influence on neuronal degeneration can be considered in a coculture of dopaminergic neurons and primary human astrocytes in 3D in BOMIMESYS® *Brain*.

Astrocytes **Dopaminergic neurons** **Co-culture**

3D culture in
BioMIMESYS®
Brain

Nuclei
GFAP
β-3-tubulin

200µm
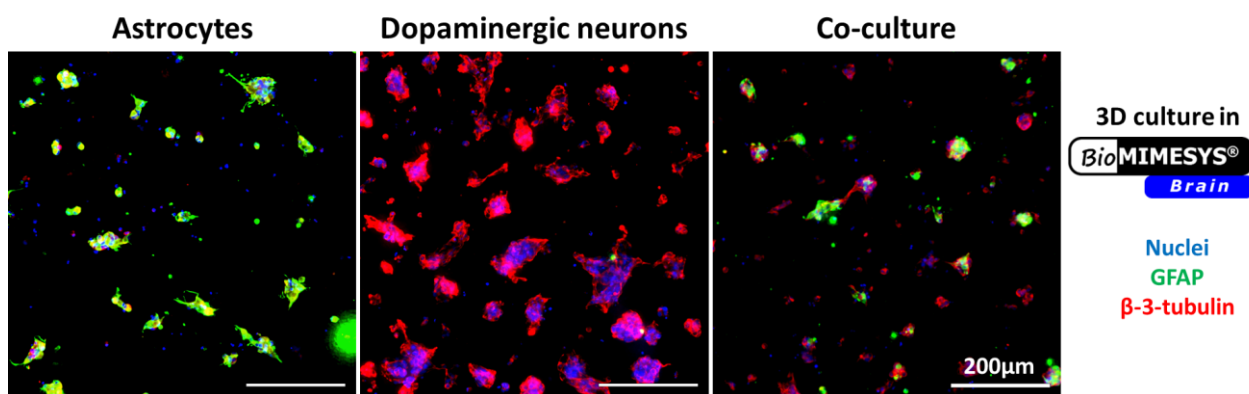
These models are available in 96-well plate, compatible with immunostaining and with robotic platforms, and thus can be used for High Content Screening of your molecules.

Read out : **cell viability, neuronal marker expression, etc.**

Check our other brochures for more details on each model, or visit our website.