RealBrain® Human Neural 3D Tissue Models

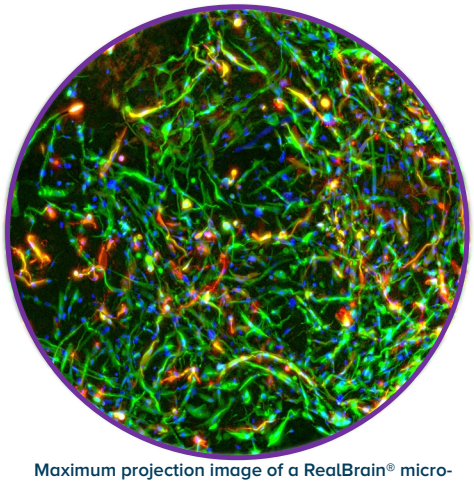
TESSARA THERAPEUTICS

COMPLEXITY WITHOUT THE COMPROMISE

RealBrain® micro-tissues contain self-organised neurons and glia that form 3D functional neural networks embedded in their own, cell-secreted extracellular matrix in only 3 weeks.

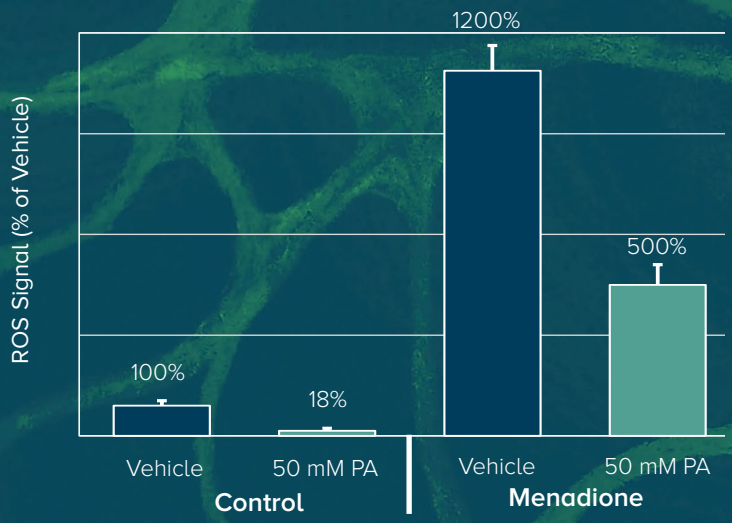
RealBrain® micro-tissues are optically clear, and easily scalable using automated production methods.

This unique combination of features provides high biological relevance without the compromises of tedious handling or poor scalability, making RealBrain® models the ideal choice for neural drug screening programs.



Maximum projection image of a RealBrain® micro-tissue. Red: GFAP. Green: B3-Tubulin. Blue: DAPI

Responsiveness to ROS inducer menadione



Mature RealBrain® neural micro-tissues were exposed to 20 µM menadione (a ROS inducer) for a period of 3 days, in the presence and absence of PA (a proprietary ROS inhibitor).

Production of ROS (peroxide) was quantified using a luminescence assay.

Menadione treatment of the micro-tissues was found to increase ROS 12x.

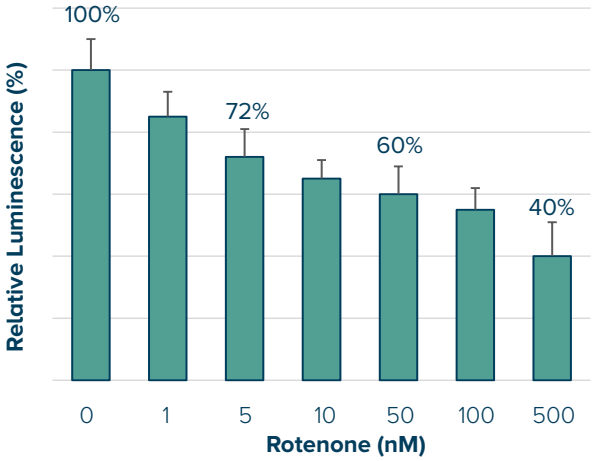
PA was a strong inhibitor of ROS production, decreasing levels to 18-40% of vehicle-only treatments.

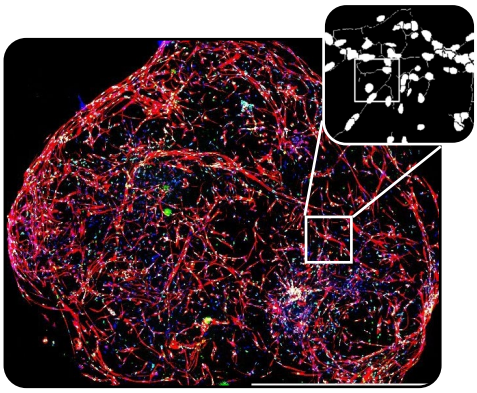
Rotenone toxicity curve

Mature RealBrain® neural micro-tissues were exposed to concentrations of rotenone ranging from 0 to 500 nM for a period of 3 days.

Viability was then assessed using a luminescent assay.

Micro-tissues demonstrated consistently decreasing viability across the concentration range, decreasing to 40% of control at 500 nM.



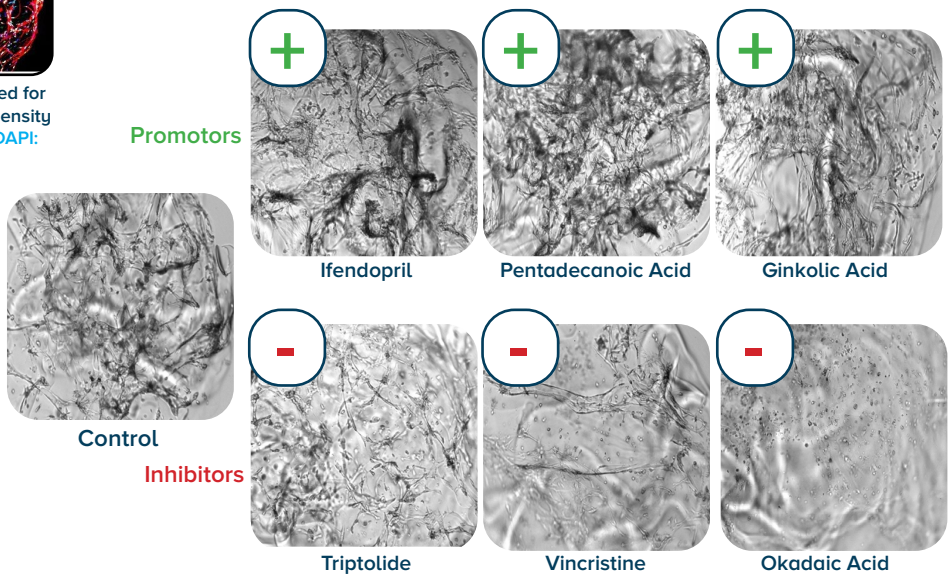


Digitally reconstructed 3D images can be used for automated quantification of neural network density
GFAP: Neurons. Sox2: Immature neurons. DAPI: Nucleii

Screening modulators of neural network density

RealBrain® models develop functional neural networks during a 3 week maturation period. Network structure and neurite density can now be quantified using the MetaXpress® High-Content Image Acquisition and Analysis Software from Molecular Devices.

Neural network density in RealBrain® models responded as predicted to treatment with either neural network promotors (ifendopril, pentadecanoic acid, ginkolic acid), or inhibitors (triptolide, vincristine, okadaic acid).



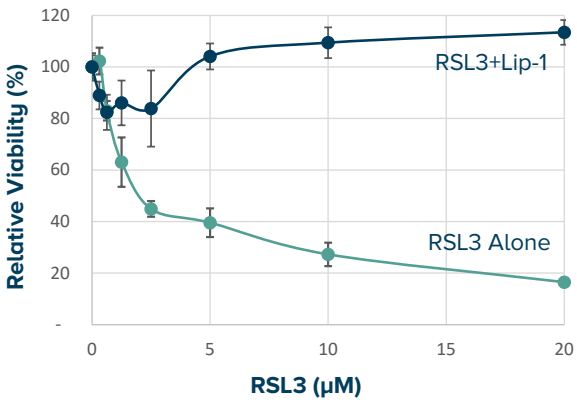
Cell death screening

In an industry first, RealBrain® micro-tissues are the first human 3D neural model to successfully model ferroptosis, the iron-dependent cell death pathway.

Control micro-tissues were treated with RSL3 (ferroptosis inducer) in the presence or absence of liproxstatin-1 (ferroptosis inhibitor).

Viability declined consistently in controls with increasing doses of RSL3, dropping to 25% at an RSL3 concentration of 10 µM (mean +/- SE, n=3).

In contrast, cells treated with Lip-1 were protected against ferroptosis, with viability remaining at 110% at an RSL3 concentration of 10 µM.



RealBrain Product Platform

Starting Cell Type	Neural progenitor cells
Scaffold: RealBrain® Matrix	Defined, bio-degradable, tuneable
Full Maturity	21 days
Mature Phenotype	Glia/Neurons/NPCs/ECM
Format	96 or 384 wells
Plate Manufacturing	CRO or at your facility
High optical clarity	Yes
Broad disease applicability	Yes
Acute & chronic toxicity	Yes

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