

In Vitro Cell-Based Assays Optimized for 3D Models

Quick, sensitive assay kits have been validated for use with 3D models, so you can easily monitor cell health, viability, apoptosis, metabolism and cytotoxicity. Scan below for peer-reviewed literature demonstrating applications.

Organoids and Other Advanced 3D models

Multifunctional profiling of triple-negative breast cancer patient-derived tumoroids for disease modeling

CellTiter-Glo® 3D Cell Viability Assay and RealTime-Glo™ MT Cell Viability Assay were used to measure tumoroid viability pre- & post-treatment. Lactate-Glo™ Assay was used to quantify levels of lactate secretion by tumoroids following drug treatment. All assays were paired with a GloMax® plate reader to measure luminescence.



N-methyl-D-aspartate Receptor-mediated Preconditioning Migrates Excitotoxicity in Human Induced Pluripotent Stem Cell-derived Brain Organoids

Glutamate-Glo™ Assay and LDH-Glo™ Cytotoxicity Assay were paired with a GloMax® Luminometer to measure glutamate concentrations and excitotoxic cell death in brain organoids, respectively.



Unravelling Mechanisms of Doxorubicin-Induced Toxicity in 3D Human Intestinal Organoids

CellTiter-Glo® 3D Cell Viability Assay and Caspase-Glo™ 3/7 3D Assay were paired with a GloMax® Luminometer to measure viability and apoptosis, respectively, in small intestine and colon organoids following drug treatment.



A three-dimensional human adipocyte model of fatty acid-induced obesity

CellTiter-Fluor™ Assay was used to obtain cell viability in a scaffold-supported 3D cell culture model. Glucose Uptake-Glo™ and Glycerol-Glo™ Assays were used to quantify the uptake of 2-deoxyglucose and glycerol release, respectively, by adipocytes in a 3D paper scaffold.



Microfluidic Organ-on-a-Chip

Setup of human liver-chips integrating 3D models, microwells and a standardized microfluidic platform as a proof-of-concept study to support drug evaluation

LDH-Glo® Cytotoxicity Assay and CellTiter-Glo® 3D Cell Viability Assay were used to measure cell health while establishing an increasingly complex 3D human liver-chip model.



Pump-less, recirculating organ-on-a-chip (rOoC) platform

CellTiter-Glo® 3D Cell Viability Assay was paired with the P450-Glo™ CYP3A4 Assay with Luciferin-IPA to test the viability and functionality of 3D liver organoids on a new recirculating organ-on-a-chip platform.



A high-throughput biomimetic bone-on-a-chip platform with artificial intelligence-assisted image analysis for osteoporosis drug testing

CellTiter-Glo® 3D Cell Viability Assay was paired with a microplate reader to assess viability.



Impact of aerosols on liver xenobiotic metabolism: A comparison of two methods of exposure

CellTiter-Glo® Reagent and P450-Glo™ CYP1A1, CYP1B1, CYP1A2, & CYP3A4 assays were used to measure cell viability and to track the enzyme activities of each cytochrome P450 isoform in liver spheroids, respectively. LDH-Glo® Cytotoxicity Assay was used to monitor levels of cytotoxicity in a complex microphysiological system.



See validation data for all 3D assays:

<https://www.promega.com/applications/3d-assays-and-tools-to-monitor-cell-biology/>



Assays and Tools for 3D Cell Cultures and Other Complex Models

CELL HEALTH	SIZE	CAT#
RealTime-Glo™ MT Cell Viability Assay	100 reactions	G9711
CellTiter-Glo® 3D Luminescent Cell Viability Assay	10ml	G9681
LDH-Glo™ Cytotoxicity Assay	10ml	J2380
CellTox™ Green Cytotoxicity Assay	10ml	G8741
Caspase-Glo® 3/7 3D Assay	10ml	G8981
RealTime-Glo™ Annexin V Apoptosis and Necrosis Assay	100 assays	JA1011
P450-Glo™ Assays (Kits available for CYP1A1, CYP1A2, CYP1B1, CYP2B6, CYP2C8, CYP2C9, CYP2C19, CYP2D6, CYP26A1, CYP26B1 and CYP3A4)	10ml	Various
Autophagy LC3 HiBiT Reporter Assay System	Reporter cell line/vector	GA1040
RealTime-Glo™ Extracellular ATP Assay	200 assays	GA5010
CELL METABOLISM		
Glucose Uptake-Glo™ Assay	5ml	J1341
Glucose-Glo™ Assay	5ml	J6021
Lactate-Glo™ Assay	5ml	J5021
Glutamate-Glo™ Assay	5ml	J7021
Glutamine/Glutamate-Glo™ Assay	5ml	J8021
Glycerol-Glo™ Assay	5ml	J3150
Triglyceride-Glo™ Assay	5ml	J3160
Cholesterol/Cholesterol Ester-Glo™ Assay	5ml	J3190
GSH/GSSG-Glo™ Assay	10ml	V6611
ROS-Glo™ H2O2 Assay	10ml	G8820
NAD/NADH-Glo™ and NADP/NADPH-Glo™ Assays	10ml	G9071, G9081
CELL EXPRESSION & GENOME ANALYSIS		
ReliaPrep™ RNA Miniprep Systems	10 preps	Z6010
Reverse Transcription System	100 reactions	A3500
GoTaq® qPCR and RT-qPCR Systems	5ml	A6001
Maxwell® RSC simplyRNA Tissue Kit	48 preps	AS1340
GoTaq® Probe qPCR and RT-qPCR Systems	2ml	A6101
QuantiFluor® RNA System	1ml	E3310
Maxwell® RSC Cultured Cells DNA Kit	48 preps	AS1620
INFLAMMATION		
Caspase-Glo® 1 Inflammasome Assay	10ml	G9951
Lumit™ HMGB1 Human/Mouse Immunoassay	100 assays	W6110
Lumit™ IL-1β Human Immunoassay	100 assays	W6010
Lumit™ IFN-γ Human Immunoassay	100 assays	W6040
Lumit™ TNF-α Human Immunoassay	100 assays	W6050
Lumit™ IL-6 Human Immunoassay	100 assays	W6030
Lumit™ IL-10 Human Immunoassay	100 assays	W6070
Lumit™ IL-2 Human Immunoassay	100 assays	W6020
Lumit™ IL-18 Human Immunoassay	100 assays	CS3291A01

View More 3D Model Resources:

<https://www.promega.com/resources/guides/cell-biology/3d-cell-culture-guide/>



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