

XF Glycolysis Stress Test with Primary Rat Cortical Neurons

ASSAY OVERVIEW: General guidelines for performing the **XF Glycolysis Stress Test** assay with primary rat cortical neuron cells. This **Assay Guide** is for use on either XF^e96, XF96, or XFp Analyzers[‡].

- This guide is associated with the **XF^e96** Assay Template: **Neurons-GLYCO-96** (.asyt file).
- This assay may be adapted for acute injections (compounds). Assign the acute injection to Port A, and reassign the injections of glucose, oligomycin and 2-deoxyglucose to ports B, C and D, respectively.
- Cells are to be plated at the indicated density 14 day(s) prior to the assay.
- The compound concentrations listed are *final* concentrations in well.
- Sample data is provided below. Absolute rates and magnitude of responses may vary based on biological and experimental variables.

Please note: Further optimization may be required depending on parameters tested and variables modified.

INJECTION STRATEGY: XF Glycolysis Stress Test
(Final concentration in well)

- Port A: 10 mM glucose
- Port B: 1.0 μM oligomycin
- Port C: 50 mM 2-deoxyglucose (2-DG)
- Port D: N/A

PRETREATMENTS:

- Control Group(s)
- Experimental Group(s)

ASSAY MEDIA: Neuron Glyco Stress Assay Medium

- Artificial Cerebrospinal Fluid (aCSF, 120 mM NaCl, 3.5 mM KCl, 1.3 mM CaCl₂, 0.4 mM KH₂PO₄, 1 mM MgCl₂, 5 mM HEPES) + 2 mM glutamine, pH 7.4.
- Initial Assay Volume: 180-200 μL

CELL SEEDING DENSITY:

- Primary cortical neuron cells (rat embryo day 18)
- 1.8 x 10⁴ cells/well, plated 14 days prior to assay

INSTRUMENT PROTOCOL:

- Calibrate
- Equilibrate
- Basal: 3 cycles
- 3 min *Mix*, 0 min *Wait*, 3 min *Measure*
- Inject Port A followed by 3 cycles
- 3 min *Mix*, 0 min *Wait*, 3 min *Measure*
- Inject Port B followed by 3 cycles
- 3 min *Mix*, 0 min *Wait*, 3 min *Measure*
- Inject Port C followed by 3 cycles
- 3 min *Mix*, 0 min *Wait*, 3 min *Measure*

XFp ANALYZER:

- All assay parameters (assay volumes, cell seeding density and all concentrations of media components and XF Cell Mito Stress Test compounds) remain unchanged.
- Groups are limited to 2 per plate (3 wells per group)

TYPICAL ASSAY DATA RESULTS FOR XF^e96, XF96, and XFp Analyzers[‡] (Prior to normalization)

Expected range of initial rate	Glucose response of initial rate*	Oligomycin response of initial rate*	2-Deoxyglucose response of initial rate*
117-25 mpH/min	145%	325%	80%

*The indicated values represent a percentage of the initial rate and may vary +/-20%

[‡] For XF^e24 and XF24 Analyzers, refer to **Assay Tech Hints: Modifying XF^e96 Parameters for XF^e24 and XF24 Analyzers**