

# NEUROBIOLOGY RESEARCH

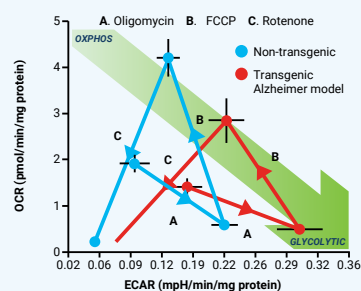
Agilent Seahorse XF Technology

Technical Flyer

## XF Technology Measures Key Parameters of Neurological Cell Conditions

### Measure critical indicators of neurodegenerative disease

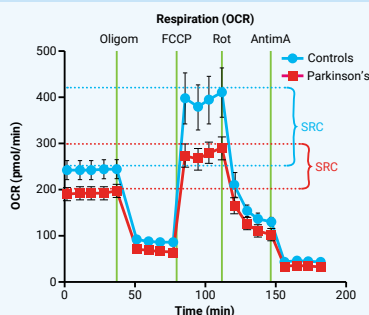
#### Metabolic Activity



**Alzheimer's hippocampal neurons from mouse model exhibit decreased OXPHOS and increased glycolysis.**

Adapted from Yao et al. (2009) PNAS

#### Metabolic Potential

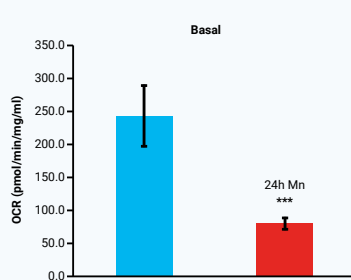


**Parkinson's cells exhibit decreased metabolic potential: Spare Respiratory Capacity (SRC).**

Adapted from Ambrosi et al. (2014) Biochimica et Biophysica Acta

### Discover pathways and effects of neurotoxins and substrates

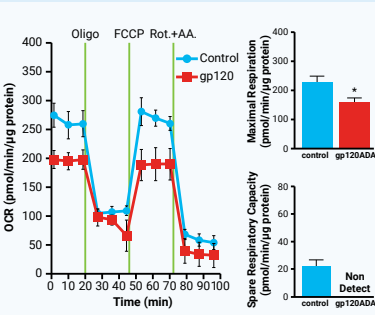
#### Neurotoxicity: Effects



**Manganese exposure induces neuroinflammation by impairing OXPHOS activity in mouse astrocytes.**

Adapted from Sarkar et al. (2017) Neurotoxicology

#### Neurotoxicity: Pathways

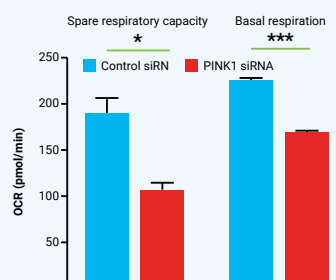


**The HIV protein gp120 decreases metabolic activity (OXPHOS) and metabolic potential (SRC) in neurons.**

Adapted from Avdoshina et al. (2016) Neurotox Res

### Model and modulate neurodegenerative disorders

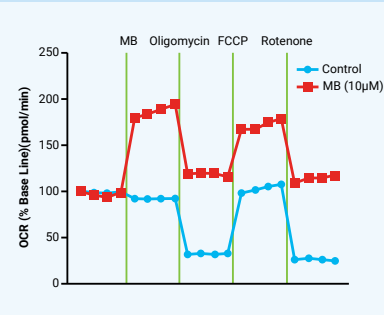
#### Disease Modeling



**PINK1 knock down, a model of Parkinson's disease, exhibits decreased OXPHOS and SRC.**

Adapted from Merwe et al. (2016) Neurobiol

#### Disease Modulation



**Methylene blue protects astrocytes against glucose oxygen deprivation by improving cellular respiration.**

Adapted from Roy Choudhury et al. (2015) PLoS One

### Early Detection

Seahorse XF Technology demonstrated that mitochondrial bioenergetic deficit precedes Alzheimer's pathology in female mouse model of Alzheimer's disease

Yao et al. (2009) PNAS



**Measures both major metabolic pathways simultaneously – respiration and glycolysis**

- Live cell
- Real-time
- Label-free
- Dynamic injection ports



**Agilent Technologies**

# XF Technology Provides a Window into Neurological Cell Function

## Neurodegenerative Disorders and Neurobiology Research

- Parkinson's
- Alzheimer's
- Huntington's
- Amyotrophic lateral sclerosis
- Leigh syndrome
- Aging
- Bipolar
- Epilepsy
- HIV
- *And more*

## Stem cells: differentiating neural progenitor cells



- Identify pluripotency and differentiation transitions
- Differentiation potential
- Differentiation confirmation

## XF Analyzers also measure metabolic function in isolated mitochondria and permeabilized cells



**XF Assays & Kits provide standard, reliable, and consistent measures of:**

- Mitochondrial Function
- Glycolytic Function
- Metabolic Phenotype
- Cell Fuel Flexibility/Preference

XF96



## Learn More About Seahorse XF Technology and Neurobiology Research [agilent.com/chem/neuroxf](http://agilent.com/chem/neuroxf)

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XF Glycolysis Stress Test Kit  
XF Glycolytic Rate Assay Kit  
XF Mito Fuel Flex Test Kit  
XF Cell Energy Phenotype Test Kit

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