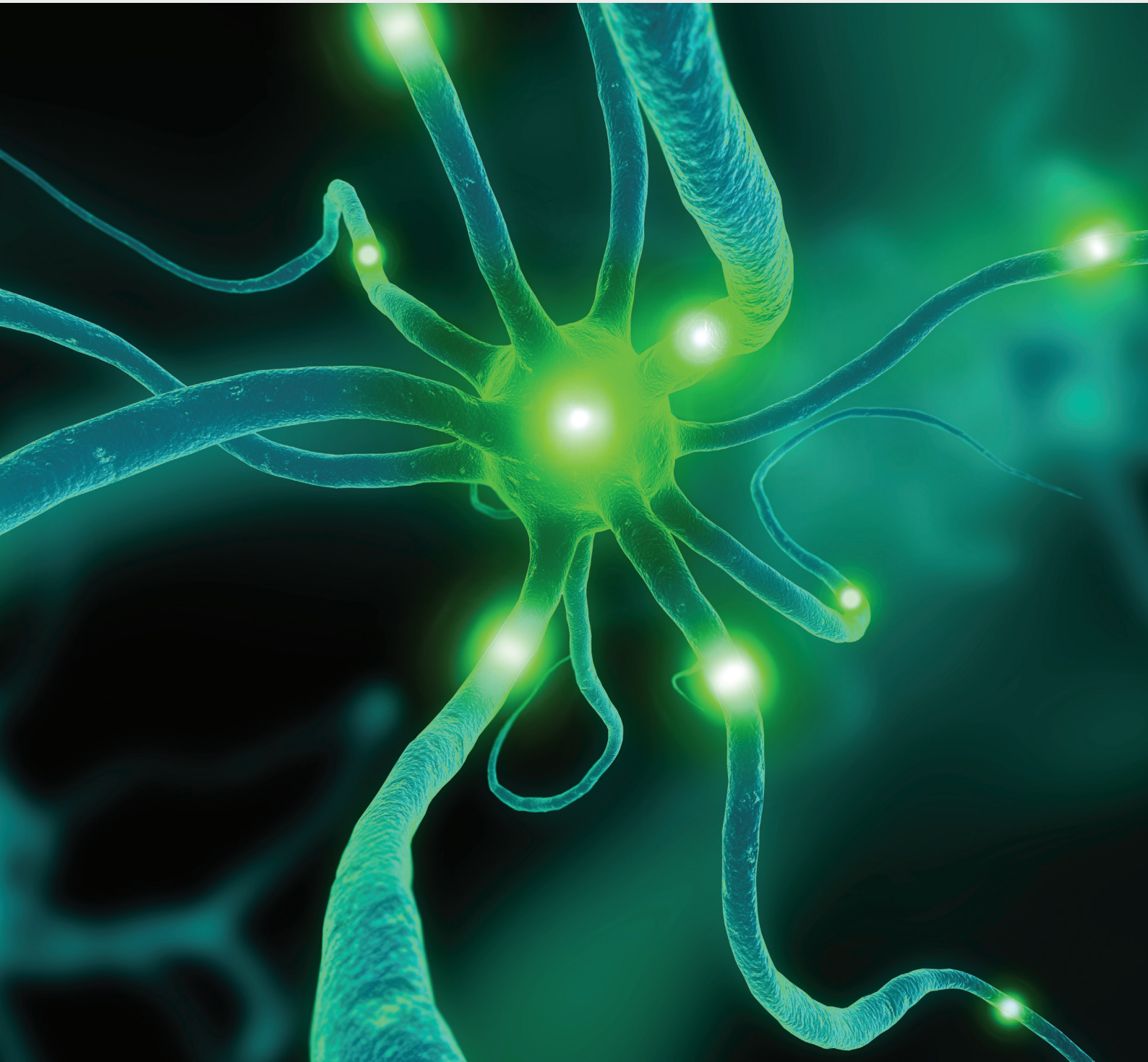




# Neuroscience

Innovative Tools for Neurodegeneration  
& Neural Signaling





# DISSECT COMPLEX NEURODEGENERATIVE DISEASE PATHWAYS & NEURAL SIGNALING NETWORKS

It is estimated that the aging worldwide population will result in over 100 million sufferers of dementia by the year 2050, a postulate that continues to drive major research efforts in neurodegenerative diseases and the associated loss of cognitive function. Diseases such as Alzheimer's (AD), Parkinson's (PD), Huntington's (HD), and Amyotrophic Lateral Sclerosis (ALS) are diseases of protein homeostasis (proteostasis), characterized by loss of specific neuronal populations, and the presence of inclusion bodies consisting of insoluble, unfolded proteins. Drug development programs for treatment of these diseases include modulators of key proteins and enzymes that regulate proper protein folding, modification, and clearance, seeking to reverse or prevent the accumulation of protein.

## Neurodegenerative Markers

### Alzheimer's Disease

APP  $\Delta$ C31 ELISA Kit  
 Tau & Phospho-Tau Antibodies  
 14-3-3 Proteins & Antibodies  
 $\beta$ -amyloid Peptides & Antibodies  
 BACE Enzymes & Inhibitors  
 Presenilin 1 & 2 mAbs  
 24(S)-Hydroxycholesterol ELISA Kit  
 Caspase-6 Enzyme & Inhibitors

### Parkinson's Disease

$\alpha$ -synuclein Protein & Antibodies  
 Parkin (human) pAb  
 HSC70 Protein & Antibodies

### Huntington's Disease

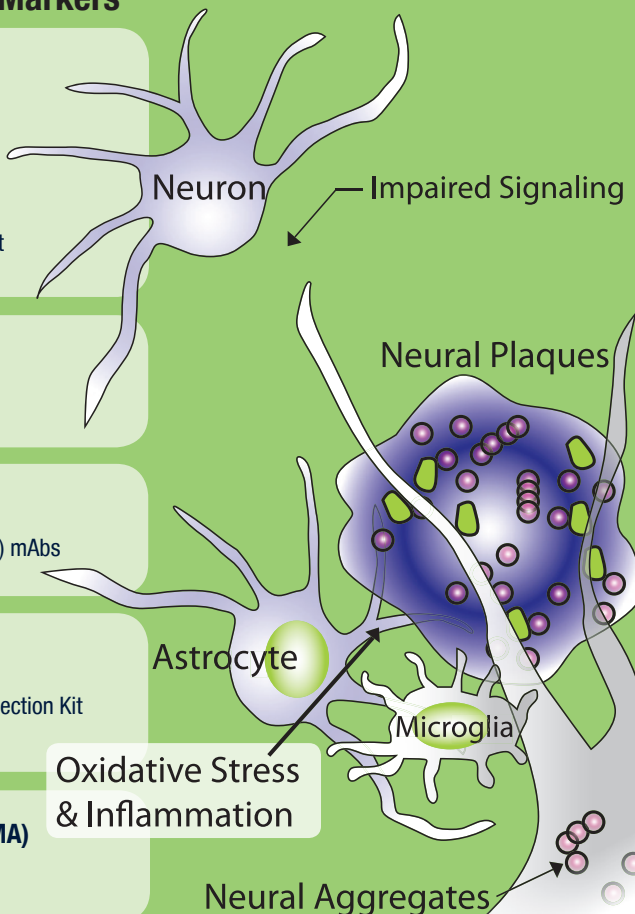
Huntingtin pAb  
 Huntingtin-Interacting Protein (HIP) mAbs  
 Caspase-6 Enzyme & Inhibitors

### ALS

SOD-1 Antibodies  
 MITO-ID<sup>®</sup> Membrane Potential Detection Kit  
 ROS-ID<sup>®</sup> Superoxide Detection Kit

### Spinal Muscular Atrophy (SMA)

SMN ELISA Kit  
 SMN Protein & Antibody



## Altered Processes

### Gene Expression & Copy Number

CYTAG<sup>®</sup> CGH Labeling Kits  
 BIOARRAY<sup>™</sup> Amplification & Labeling Systems  
 SCREEN-WELL<sup>®</sup> Epigenetics Compound Library  
 FLUOR DE LYS<sup>®</sup> HDAC & Sirtuin Assays

### Protein Synthesis & Folding

STRESSGEN<sup>®</sup> HSP/Chaperone Products  
 HSP70/HSP40/HSP27/HSF-1 Antibodies & ELISAs  
 $\alpha$ B-crystallin Protein & Antibodies

### Post-translational Modification

Mono- & Polyubiquitylation Antibodies  
*In vitro* Ubiquitylation & SUMOylation Kits  
 UBIQAPTURE-Q<sup>®</sup> & SUMO-QAPTURE-T<sup>®</sup> Kits  
 SUMO-1, -2, -2/3 & -3 Antibodies  
 FLUOR DE LYS<sup>®</sup> HDAC6 Drug Discovery Kit

### Aggregate Clearance/Protein Degradation

PROTEOSTAT<sup>®</sup> Aggresome Detection Kit  
 CYTO-ID<sup>®</sup> Autophagy Detection Kit  
 p62 (SQSTM1)/NBR1 ELISA Kits  
 SCREEN-WELL<sup>®</sup> Autophagy Compound Library  
 LYSO-ID<sup>®</sup> Red Detection Kit  
 Proteasome ELISA Kit

### Oxidative Stress

Heme Oxygenase ELISAs & Antibodies  
 ROS-ID<sup>®</sup> ROS/RNS Detection Kit  
 SOD Antibodies & Activity Assays  
 SCREEN-WELL<sup>®</sup> REDOX Compound Library

## Assay Kits

Our portfolio of over 300 ELISA and detection kits includes sensitive, specific assays for neuroactive peptide hormones, signaling molecules, oxidative stress and cell death critical to neural signaling and neurodegenerative pathways.

Enzo's CELLESTIAL<sup>®</sup> fluorescent probes and assay kits include innovative assays for monitoring protein aggregation, autophagy, calcium mobilization, oxidative stress and toxicity profiling. Our dye-based assays are optimized for the most demanding imaging applications to deliver consistent, reproducible results.

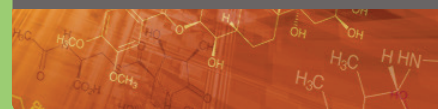
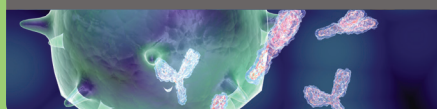
## High Quality Antibodies

We offer over 3,000 antibodies, including monoclonal and polyclonal antibodies for the detection of key markers of neurodegeneration and neural signaling such as tau,  $\beta$ -amyloid, Parkin, LC-3, SMN1, ion channels, and synaptic vesicle markers.

Every antibody is backed by our Worry-Free Antibody Trial Program, allowing you to evaluate any of our antibodies of interest for your specific application or species without risk.

## Small Molecule Chemistry & Compound Libraries

Our long-standing, flagship SCREEN-WELL<sup>®</sup> Compound Library portfolio offers an easy, ready-to-use method to streamline compound screening. The Enzo catalog of over 3,000 biologically characterized small molecules includes curated collections of Neurotransmitters, Bioactive Lipids, Ion Channel Ligands, Endocannabinoids, and Natural Products. Pathway targeting libraries for Autophagy, Epigenetics, and Wnt modulators facilitate Mechanism of Action analysis.



# MONITOR NEURODEGENERATIVE PROTEIN AGGREGATION

Although the mechanism may vary from one class of neurodegenerative disease to another, the principle pathologies of AD, PD, HD, and ALS are similar: the cell's defense mechanisms against protein aggregation (i.e., molecular chaperones, protein degradation & recycling pathways) become overwhelmed, leading to structural defects, apoptosis, and cognitive defects associated with loss or impairment of neural cell function.

## PROTEIN FOLDING & AGGREGATION

### PROTEOSTAT® AGGREGOSOME DETECTION KIT (ENZ-51035)

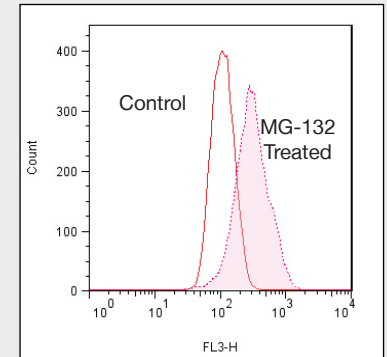
Molecular-rotor dye yields robust, quantitative detection of aggregated proteins

### Heat Shock Proteins & Oxidative Stress

The definitive collection of STRESSGEN® ELISA Kits and reagents for molecular chaperones and oxidative stress

$\alpha$ B-Crystallin	HSP70 & HSC70
Calnexin	HSP90
Calreticulin	Grp75
DNA Damage (8-OHdG)	Grp94
HSP25/27	Heme Oxygenase
HSP40	Superoxide Dismutase (SOD)
HSP60	ROS-ID™ ROS/RNS Detection Kit

### Quantify Aggresomes and Inclusion Bodies by Flow Cytometry



## AGGREGATE CLEARANCE AND SURVIVAL

### CYTO-ID® AUTOPHAGY DETECTION KITS (ENZ-51031/ENZ-KIT175)

A no-transfection quantitative assay for measuring autophagy in live cells

### p62 & NBR1 ELISA Kits (ADI-900-211/212)

Sensitive & specific ELISAs for detection of key autophagosomal scaffold proteins

### SCREEN-WELL® Autophagy Compound Library (BML-2837)

94 ready-to-screen compounds with defined autophagy-inducing or -inhibiting activity

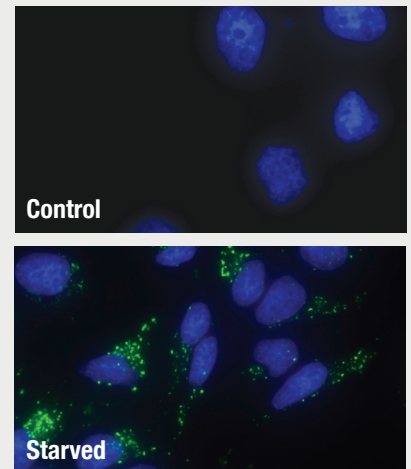
### LYSO-ID® Red & Green Detection Kits (ENZ-51005/51034)

Highly photostable dyes to specifically monitor the lysosomal degradation pathway

### Ubiquitin & Proteasome Solutions

Extensive portfolio of ubiquitin ligases, ubiquitinated substrates, and antibodies for detection of mono- and poly-ubiquitination, proteasome inhibitors, and more

### Profile Autophagy Without Transfection



Quantify autophagic vesicles with minimal background

## APOPTOSIS/NECROSIS

### MITO-ID® MEMBRANE POTENTIAL CYTOTOXICITY KIT (ENZ-51019)

A real-time mitochondrial membrane potential assay with superior sensitivity

### GFP-CERTIFIED® APOPTOSIS/NECROSIS DETECTION KIT (ENZ-51002)

Multiplex analysis of apoptotic and necrotic cells, compatible with GFP-expressing cell lines and other green fluorescent probes

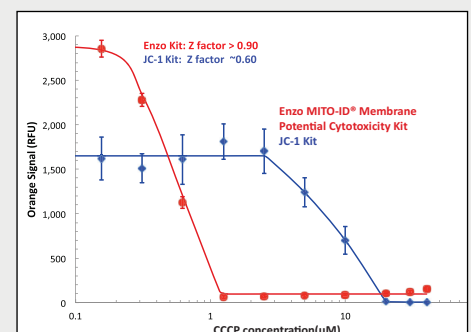
### Caspase-6 Activity

Screen activators and inhibitors of this executioner caspase with high-activity enzyme and colorimetric (pNa) and fluorimetric (AMC) labeled substrates

### Apoptosis ELISA Kits

Annexin V	Bax	Bcl-2	Cytochrome C
DNA Damage	p53/MDM2	Survivin	XIAP

### Detect Mitochondrial Toxicity With 10X More Sensitivity Than JC-1

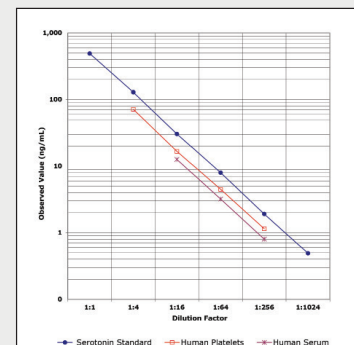


High-throughput analysis of mitotoxicity

# QUANTIFY NEUROACTIVE PEPTIDES & SECOND MESSENGERS

As our understanding of neurodegenerative disease origins increases, so does the need for innovative, high quality research tools for developing potential therapeutics. The breadth of Enzo's expertise across research disciplines from proteostasis and cell analysis, to small molecule chemistry and assay development provides a unique collection of innovative reagents and assays to monitor neural signaling networks.

## Standard Accurately Mimics Native Serotonin in Biological Matrices



## Neuroactive Peptide & Stress Hormone ELISAs

Angiotensin	Bradykinin	Corticosterone
Cortisol	Endothelin-1	Gastrin
Histamine	LVV-Hemorphin	Oxytocin
Serotonin	Substance P	Vasopressin

## SEROTONIN ELISA KIT (ADI-900-175)

- No acylation step required
- High-sensitivity, measuring as little as 293 pg/mL
- Validated for platelets, plasma, serum, and urine

## cAMP/cGMP ELISA Kits

Most Sensitive and Complete Colorimetric ELISA Kits

- Enhance sensitivity by 10-fold with optional protocol
- Species-independent
- Validated with a broad range of sample types

		PRODUCT #	SAMPLE TYPES						
			Intracellular		Extracellular				
			Cell Lysates	Tissue Extract	Culture Supernatant	Serum	Saliva	Urine	Plasma
cAMP	Complete	ADI-900-163	✓	✓	✓	✓	✓		
	Direct	ADI-900-066	✓	✓					
	Standard	ADI-900-067			✓	✓	✓		
cGMP	Complete	ADI-900-164	✓	✓	✓	✓	✓		✓
	Direct	ADI-900-014	✓	✓					
	Standard	ADI-900-013			✓	✓	✓	✓	✓

## Calcium Mobilization Assay Kits

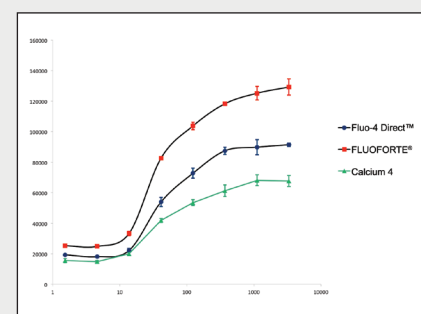
### FLUOFORTE® CALCIUM ASSAY KITS (ENZ-51016)

Brighter, More Robust Fluorescent Calcium Mobilization Assays

- Dyes optimized for cell permeability and retention deliver superior signal
- Low-cost alternative developed for use with conventional dual-dispensing microplate readers
- GFP-CERTIFIED® FLUOFORTE® Calcium Assay Kit (ENZ-51020) compatible with common green-emitting fluorescent markers

ATP dose response curves in CHO-M1 cells. CHO cells were seeded overnight. The cells were incubated with 100  $\mu$ L of Life Technologies' Fluo-4 Direct™ kit, Molecular Device's Calcium 4 kit or FLUOFORTE® dye. ATP (20  $\mu$ L/well) was added by FlexStation to achieve the final indicated concentrations. FLUOFORTE® generated the highest intensity signal.

### Obtain Robust Signal Intensity 2x Brighter Than Fluo-4



## FOCUSED COMPOUND LIBRARIES FOR NEUROMODULATOR SCREENING

Enzo has a long and successful history identifying, synthesizing, and commercializing known bioactives for use as research tool compounds and assembling focused libraries for chemical genomics, receptor de-orphaning, drug repurposing, pathway analysis, and more.

- Compounds supplied in ready-to-screen format in biocompatible solvents
- Complete documentation includes SD files for inclusion in your database
- Bulk compounds available for re-supply

### SCREEN-WELL® Library Compounds

Endocannabinoids	58
Fatty Acids	65
FDA-Approved Drugs	770
Ion Channel Ligands	70
Natural Products	502
Neurotransmitters	661
Orphan Ligands	84

## More than just libraries...

Enzo offers over 3,000 biologically characterized small molecules as stand-alone catalog items, including ion channel activators, neurotransmitters, kinase, protease & phosphatase inhibitors, and more.

# HIGH-QUALITY DETECTION SOLUTIONS

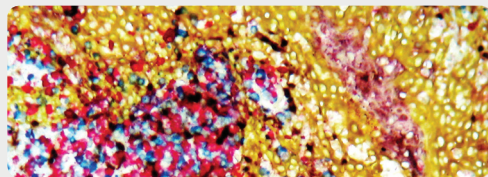
## MULTIPLEX DETECTION KITS

Superior MULTIVIEW® IHC Kits for Efficient Detection of Multiple Antigens in a Single Tissue Sample

- Biotin-free nanopolymer-based system for superior multiplex antigen detection
- Complete kit includes HIGHDEF® chromogens for sensitive, crisp 2-color development
- Preserves precious tissue while reducing reagent and labor costs
- Expandable with additional chromogens (sold separately)

### Multiplex Detection Kits

PRODUCT NAME	PRODUCT #
MULTIVIEW® (mouse-HRP/rabbit-AP) Kit	ADI-950-100
MULTIVIEW® (mouse-HRP/mouse-AP) Kit	ADI-950-101



## NANOPOLYMER DETECTION REAGENTS & KITS

Highest Sensitivity, Lowest Background POLYVIEW® PLUS HRP Detection Reagents & Kits

- Biotin-free nanopolymer detection circumvents endogenous biotin background
- High intensity color development delivers sharp, crisp staining
- Suitable for both IHC and ISH detection
- Compatible for both manual and automated platforms

### Nanopolymer Detection Reagents & Kits

PRODUCT NAME	PRODUCT #
POLYVIEW® PLUS HRP (Anti-Rabbit) Reagent	ENZ-ACC103
POLYVIEW® PLUS HRP (Anti-Mouse) Reagent	ENZ-ACC104
POLYVIEW® PLUS AP (Anti-Rabbit) Reagent	ENZ-ACC110
POLYVIEW® PLUS HRP-DAB (Anti-Rabbit) Kit	ENZ-KIT159
POLYVIEW® PLUS HRP-DAB (Anti-Mouse) Kit	ENZ-KIT160

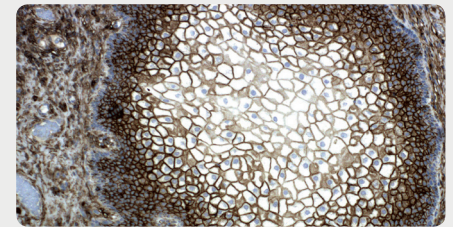
## STREPTAVIDIN DETECTION REAGENTS

High Sensitivity, Low Background SAVIEW® PLUS Reagents

- Streptavidin-based detection with reduced background
- Applicable for custom multiplexing IHC protocols
- Suitable for IHC and ISH detection
- Compatible for both manual and automated platforms

### Streptavidin Detection Kits

PRODUCT NAME	PRODUCT #
SAVIEW® PLUS HRP Reagent	ENZ-ACC102
SAVIEW® PLUS AP Reagent	ENZ-ACC111



# WORRY-FREE NEUROSCIENCE ANTIBODIES

Enzo offers over 3,000 widely cited and thoroughly validated antibodies, including nearly 500 for key markers of neurodegenerative disease, GPCRs, nerve cell structure proteins, and neural signal transduction. Each of our antibodies is backed by our **Worry-Free Antibody Trial Program**.

### NEUROTRANSMITTERS

ACTH	NPY
ANP	GABA
BNP	GLP-1
CCK	Serotonin (5-HT)
CGRP	Substance P
Dopamine	

### NEUROTRANSMITTER BIOSYNTHESIS

Aromatic L-amino acid decarboxylase (AADC)  
 Dopamine  $\beta$ -hydroxylase (DBH)  
 Glutamic Acid Decarboxylase (GAD)  
 Heme Oxygenase-1 (HO-1)  
 Phenylethanolamine N-methyltransferase (PNMT)  
 Tyrosine Hydroxylase (TH)  
 Tryptophan Hydroxylase (TPH)

### NEUROTRANSMITTER RECEPTORS

Adrenergic ( $\alpha_{2A}$ , $\alpha_{1B}$ , $\beta_1$ , $\beta_2$ )	GluR1
Angiotensin II ( $AT_1$ & $AT_2$ )	Muscarinic ( $M_1$ , $M_2$ , $M_3$ )
Bradykinin ( $B_1$ & $B_2$ )	Opioid ( $\delta$ & $\mu$ )
Cannabinoid ( $CB_1$ & $CB_2$ )	Serotonin (5-HT <sub>1A</sub> )
Dopamine ( $D_1$ & $D_2$ )	Somatostatin (1, 2, 3, 4)
GABA <sub>A</sub> & GABA <sub>B</sub>	Vasopressin ( $V_{1a}$ , $V_{1b}$ , $V_2$ )

### NEURODEGENERATIVE MARKERS

14-3-3	$\alpha$ -Synuclein
$\beta$ -amyloid	Parkin
BACE	SOD-1
GSK-3 $\beta$	SMN1
Huntingtin & HIP	
Presenilin 1 & 2	
Tau & Phospho-Tau	

### SYNAPTIC VESICLE MARKERS

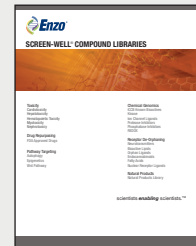
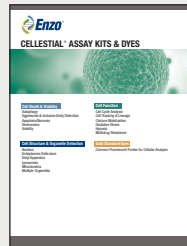
Actin	Synapsin
Bassoon	Synaptophysin
Munc-18	Synaptotagmin
PSD95	Syntaxin
SAP97	VAMP
SNAP $\alpha/\beta$	

### ION CHANNEL ANTIBODIES

2-Pore Domain Potassium Channels  
 Voltage-gated Potassium Channels  
 Sodium Calcium Exchanger  
 GABA Receptor Subunits  
 TRP Channels (A, C, M, V)  
 NMDA Receptor Subunits



**You may also be interested in:**



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serving science through innovation

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*Quality Management Systems and Environmental certified according to EN ISO 9001, ISO 13485 and EN ISO 14001*

**Put our experience to work for you!**

Our broad range of scientific expertise and industry-proven manufacturing capabilities enables us to provide a comprehensive set of neuroscience tools to save you time and money!

MB6-110216