



# EPIGENETICS



## Sample Extraction Kits

EPIXTRACT® Kits

## Sample Conversion Kits

5-Methylcytosine

5-Hydroxymethylcytosine

## Drug Discovery Assays and Active Enzymes

Deacetylation

CHEMILUM DE LYS® HDAC & Sirtuin Assay

FLUOR DE LYS® HDAC & Sirtuin Assays

COLOR DE LYS® HDAC & Sirtuin Assays

Active HDAC & Sirtuin Enzymes

Acetylation/Methylation/Demethylation

SUMOylation

Ubiquitylation

## Epigenetic Activators and Inhibitors

SCREEN-WELL® Epigenetics Library

HDAC Inhibitors

SIRT Modulators

Other Epigenetic Modulators

## Detection Assays

ELISA-Based

## Antibodies for Detecting Epigenetic Changes

Ubiquitylation

Lysine Modifications

SUMOylation

DNA Methylation

Histone Modifications



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## LEADING INNOVATION IN DETECTION OF POST-TRANSLATIONAL MODIFICATION

Epigenetic modulation of gene expression is one component of the proteostasis network, and is a focus of Enzo's development efforts supported by our expertise in post-translational modification biology and high-quality manufacturing of enzyme activity assays, biochemicals, antibodies, proteins, and peptide synthesis. Our epigenetics portfolio is focused on the enzymology of epigenetic regulation including HDACs, sirtuins, HATs, methyltransferases, and demethylases.

Our revolutionary FLUOR DE LYS<sup>®</sup> HDAC and Sirtuin assays allow simple, non-radioactive measurement of deacetylase activity amenable to automated platforms. These assays are founded upon an industry-leading portfolio of active enzymes and high purity peptide substrates to deliver the sensitivity needed when dissecting epigenetic pathways. We continue to provide innovative products, such as our CHEMILUM DE LYS<sup>®</sup> kit, which eliminates false data seen with other detection platforms.

In support of screening efforts, our chemists have curated the SCREEN-WELL<sup>®</sup> Epigenetics compound library, a collection of 43 biochemicals with defined activity against epigenetic regulating enzymes, each of which can be supplied individually upon request. Our portfolio of reagents also includes antibodies for the detection of key epigenetic-regulating enzymes and substrates, including modification-specific antibodies for acetylated, methylated, phosphorylated or ubiquitinated epitopes.

# Complete Toolbox for Epigenetics Research

## ISOLATE

BIOARRAY™ Methylated DNA IP Kit  
 EPIXTRACT® DNA Isolation Kit  
 EPIXTRACT® Nuclear Protein Isolation Kits  
 EPIXTRACT® Total Histone Extraction Kits  
 POLYSUMO-QAPTURE® Kit  
 SUMO-QAPTURE-T® Kit  
 UBI-QAPTURE-Q® Kit

## MODIFY

Auto-ubiquitinylation Kit  
 BIOARRAY™ Methylation Kits  
 Express DNA Methylation Kits  
 NEDDylation Kit  
 SUMOylation Kit  
 Ubiquitin Activating Kit  
 Ubiquitinylation Kit  
 Ubiquitin Conjugating Kit (HeLa Lysate-based)

## DETECT

Acetyltransferase Activity Kits  
 Antibodies for Epigenetic Modifications  
 DNMT Colorimetric Drug Discovery Kit  
 ELISAs for 5-mC and 5-hmC Methylation  
 FLUOR DE LYS®, COLOR DE LYS®, CHEMILUM DE LYS®  
 HDAC Assays  
 Methyltransferase Activity Kits

### DNA Modifications

**5-mC DNA Methylation**  
 5-Methylcytosine DNA ELISA Kit  
 Blood & Tissue DNA Methylation Kit  
 BIOARRAY™ Methylated DNA IP Kit  
 DNMT Colorimetric Drug Discovery Kit  
 Express DNA Methylation Kit

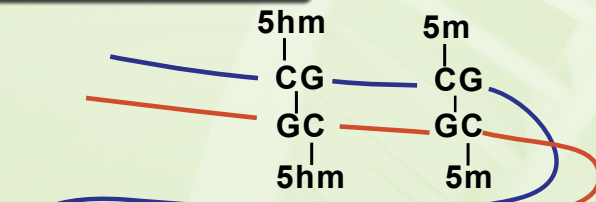
**Demethylation**  
 LSD1 Fluorometric Drug Discovery Kit  
 LSD1 Active Enzyme

**5-hmC DNA Methylation**  
 5-Hydroxymethylcytosine DNA ELISA Kit  
 BIOARRAY™ 5-hmC Methylation Kit

**Acetylation**  
 Acetyltransferase Activity Assays  
 p300/CBP Inhibitors, Activators, and Antibodies

**Ubiquitinylation**  
 UBI-QAPTURE-Q® Kit  
 Diglycyl Lysine Monoclonal Antibody (GX41)  
*In vitro* Ubiquitinylation Kit  
 Mono- & Poly-ubiquitinylation Antibodies

**Phosphorylation**  
 Phospho-specific Histone Antibodies  
 Aurora Kinase Active Enzymes & Inhibitors

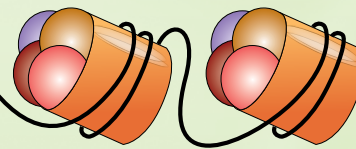


### Histone Post-translational Modifications

**Methylation**  
 Methyltransferase Activity Assays  
 CARM1, PRMT, and SET7/9 Active Enzymes  
 Mono- & Tri-methyl-specific Histone Antibodies  
 Sinefungin

**Deacetylation**  
 CHEMILUM DE LYS® HDAC & Sirtuin Assay  
 COLOR DE LYS® HDAC & Sirtuin Assay  
 FLUOR DE LYS® HDAC & Sirtuin Assays  
 HDAC Antibodies  
 Resveratrol  
 Tubacin

**SUMOylation**  
 SUMO & POLYSUMO-QAPTURE® Kits  
 SUMO-QAPTURE-T® Kits  
*In vitro* SUMOylation Kit  
 SUMO-1, -2 & -2/3 Antibodies



# SAMPLE EXTRACTION KITS

## EPIXTRACT® KITS

### Efficient Extraction Upstream for Easier Detection Downstream

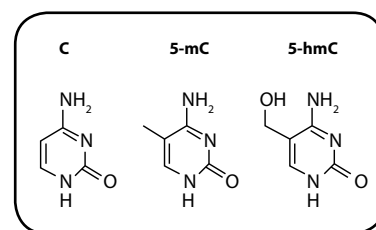
Enzo Life Sciences has been a leader in the epigenetics market, providing solutions for epigenetics analyses ranging from enzymes, modification activity and quantification assays, and epigenetics-related small molecules. Our EPIXTRACT® Kits enable rapid isolation from a wide variety of sample types.

- Guarantee reproducible, high-yield of histones, nuclear proteins, and circulating DNA
- Rapid, reliable sample isolation for downstream epigenetics applications

Product #	EPIXTRACT® Total Histone Extraction Kit		EPIXTRACT® Nuclear Protein Isolation Kit		EPIXTRACT® DNA Isolation Kit for Plasma/Serum
	ENZ-45013 (High-Throughput)	ENZ-45014	ENZ-45015 (Nucleic Acid-Free)	ENZ-45016	ENZ-45018
Size	2x96 Reactions	100 Reactions	100 Reactions	50 or 100 Reactions	50 or 100 Reactions
Sample	Cells	Cells/Tissue	Cells/Tissue	Cells/Tissue	Plasma/Serum
Format	96-well	Tube	Tube	Tube	Spin Column
Processing Time	1 Hour	1 Hour	1 Hour	< 1 Hour	< 15 Minutes

### Convenient Kits for Sample Conversion and Detection

DNA methylation can alter gene expression and cell differentiation, often resulting in unidirectional changes to genomic DNA. Because DNA methylation is involved in many processes, abnormalities in methylation patterns can lead to disease. Expanding our expertise in epigenetic modification analysis, Enzo Life Sciences offers a portfolio of products that enable detection of DNA methylation.



### High-efficiency Conversion of 5-mC and 5-hmC DNA for the Truest Downstream Analysis

- Conversion allows for resolution of single nucleotide information
- Kits provide high conversion rates without the introduction of DNA damage
- Converted output sample suitable for detection by bisulfite sequencing, methylation-specific PCR, high resolution melting curve analysis, microarray-based approaches, and next-generation sequencing

Product #	DNA Only		Blood, Tissue, FFPE, DNA		DNA Only
	Express DNA Methylation Kit (ENZ-45001, -45002, -45003)		Blood & Tissue DNA Methylation Kit (ENZ-45004)		BIOARRAY™ 5-hmC Methylation Kit (ENZ-45011)
Target & Modification	5-mC Bisulfite Modification		5-mC Bisulfite Modification		5-hmC β-Glucosyltransferase Protection
Format	Spin Column	96-Well	Spin Column	96-Well	Spin Column
Elution Volume	≥ 10 µL	≥ 15 µL	≥ 10 µL	≥ 15 µL	≥ 6 µL
Modification Efficiency	> 99.5%		> 99.5%		~100%
Processing Time	1.5 Hours		4 Hours		6-8 Hours
Input	100 pg – 2 µg of DNA		≥ 50 pg DNA, ≥ 10 Cells, Blood, Tissue, FFPE		100 ng - 500 ng DNA

# DRUG DISCOVERY ASSAYS AND ACTIVE ENZYMES

## HDAC AND SIRTUIN

### Convenient Screening Formats from the Pioneer in Non-radioactive HDAC and Sirtuin Assays

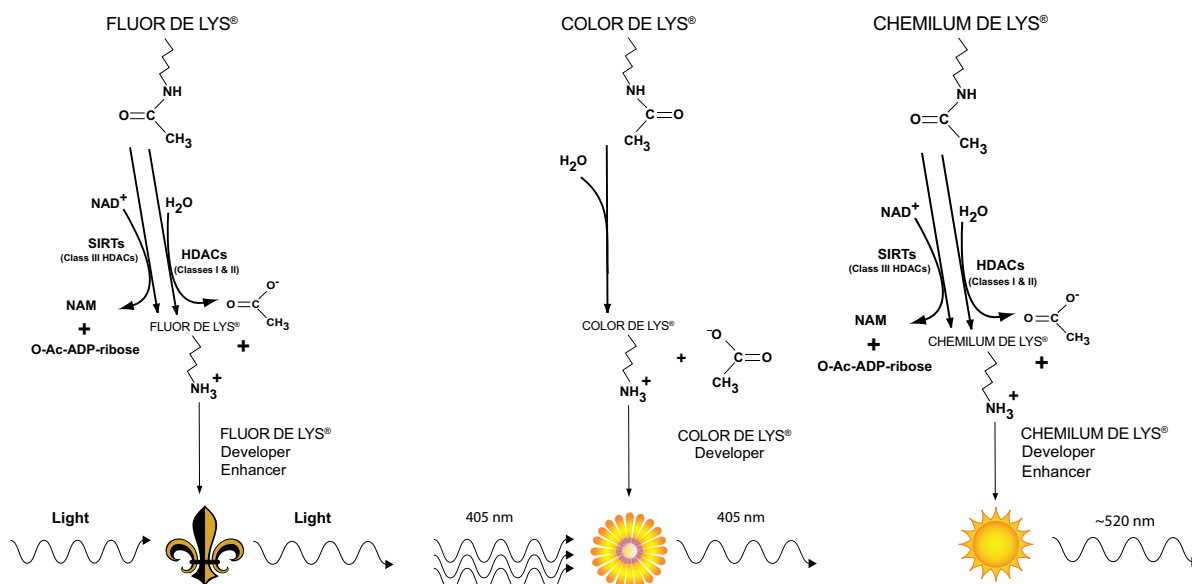
For over a decade, the FLUOR DE LYS<sup>®</sup> deacetylase assay platform has revolutionized assay of HDAC and Sirtuin enzyme activity, freeing researchers from cumbersome protocols required with radiolabeled or other modified histone-based methods. Our high quality assays utilize patented substrate/developer chemistry in combination with high-activity, high-purity enzymes, to deliver more high quality hits. Broad-class HDAC/Sirtuin screening assays are available in chemiluminescent, fluorescent, and colorimetric formats.

### Choose A Format to Fit Your Needs

**Fluorometric**  
Robust fluorescent  
screening assays

**Colorimetric**  
Option for standard  
absorbance plate readers

**Chemiluminescent**  
Ideal for cross-validation  
of fluorescent assays



**2001**

The FLUOR DE LYS<sup>®</sup> platform revolutionized the assaying of HDAC and Sirtuin enzyme activity by freeing researchers from cumbersome protocols requiring radioactivity. With an expansive citation record, this is a robust high-throughput screening method for detection of HDAC and Sirtuin modulators.

**2002**

The COLOR DE LYS<sup>®</sup> assay was developed to meet our customers' demand for an easy-to-use, highly sensitive HDAC/SIRT assay that could be used on standard absorbance-based microplate readers.

**2012**

To answer the concern over false positives resulting from fluorescent substrates, Enzo developed the CHEMILUM DE LYS<sup>®</sup> HDAC/SIRT Drug Discovery Kit. This kit delivers superior signal-to-noise ratio, with no interference from cell extract detergents. Inhibitors for both Sirtuins and HDACs are included for added flexibility. No artifactual activation by resveratrol.

## Your Best Defense Against False Data

### CHEMILUM DE LYS® HDAC/SIRT Chemiluminescent Drug Discovery Kit

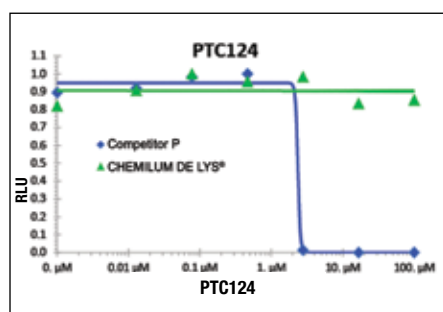
Traditional luciferase- and fluorescence-based screening assays for HDAC and Sirtuin activity are susceptible to the generation of false negatives or positives resulting from the effects of compound(s) being screened on elements of the reporter system (see table below). Based on our patent-pending CHEMILUM DE LYS® substrate and developer combination, the HDAC/SIRT Chemiluminescent Drug Discovery Kit provides a chemiluminescent alternative to radiolabeled and HPLC methods for HDAC activity. Discover the key advantages of this simple 3-step assay procedure designed to measure HDAC and Sirtuin activity in cellular or nuclear extracts, immunoprecipitates, or purified enzymes.

- High-specificity assay eliminates false positives or negatives (see table)
- Superior signal-to-noise ratio with no interference from cell extract detergents
- Consistent results from a validated system

#### Eliminate False HDAC/SIRT Screening Hits with CHEMILUM DE LYS®

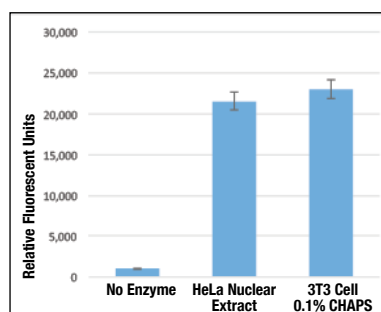
	CHEMILUM DE LYS®	Competitor HDAC Assays		
		Luciferase-Based Chemiluminescent Assay	Colorimetric Assay	Fluorometric Assay
No Artifactual Activation by Resveratrol	✓	✓		
Resistant to Protease Inhibitors	✓		✓	✓
Resistant to Kinase Inhibitors	✓		✓	✓

#### Eliminate Interference Seen in Luciferase-based Assays



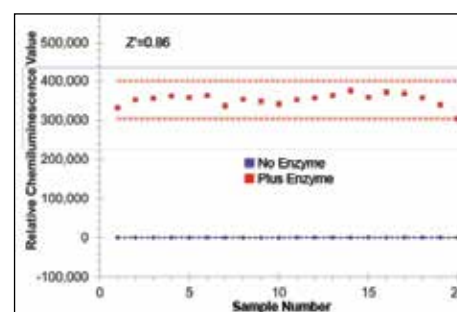
The compound, PTC124, is converted by luciferase in the presence of ATP to a high affinity multi-substrate adduct inhibitor, PTC124-AMP. PTC124 at concentrations greater than 1 μM inhibits the luciferase based assay, but has no effect on the CHEMILUM DE LYS® assay.

#### Minimize Interference from Lysis Detergents



The CHEMILUM DE LYS® assay was performed on HeLa nuclear extract, no enzyme or  $1.5 \times 10^5$  3T3 cells extracted with 0.1% CHAPS. The HDAC reaction was carried out with 25 μM CHEMILUM DE LYS® substrate for 1 hour at 37°C followed by trypsin treatment.

#### Powerful Reproducibility Ensures Consistent Results



Evaluation of Consistency by Z-factor Analysis. HeLa nuclear extract (4 μg) (red squares) or buffer (blue diamonds) was incubated for 2 hours at 24°C with 25 μM CHEMILUM DE LYS®. Reactions were stopped as described in the manual. Enhancer was added and chemiluminescence was read. Dashed lines indicate the 3x standard deviation range.

#### PRODUCT LISTING

Product Name	Product #	Size
CHEMILUM DE LYS® HDAC/SIRT Chemiluminescent Drug Discovery Kit	BML-AK532	96 Reactions



## DEACETYLATION

### Lighting the Way to Innovation

#### FLUOR DE LYS® HDAC Cellular Activity Assay Kit

HDAC activity can vary due to expression level in different cell types. Therefore, cell-based HDAC experiments are especially relevant for their ability to address the natural context of HDAC enzymes.

- Cell-permeable substrate for monitoring intracellular deacetylase activity
- Provides accurate activity information reflective of endogenous regulation
- Allows detection of inhibitors or activators that act indirectly to affect deacetylase activity
- Suitable for high-throughput analysis

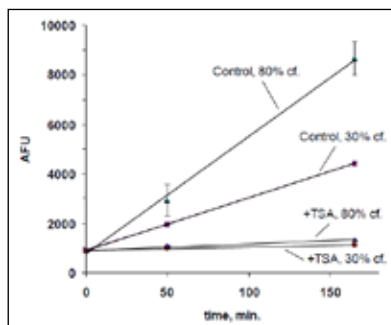
#### GENERAL HDAC/SIRTUIN ASSAY KITS

Product Name	Product #	Size
FLUOR DE LYS® HDAC Cellular Activity Assay Kit	BML-AK503	96 Reactions
FLUOR DE LYS® HDAC Activity Assay Kit	BML-AK500	96 Reactions
FLUOR DE LYS® Green HDAC Activity Assay Kit	BML-AK530	96 Reactions

#### ENZYME-SPECIFIC HDAC/SIRTUIN ASSAY KITS

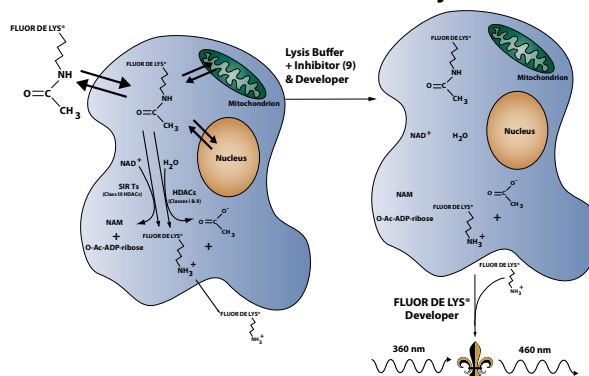
FLUOR DE LYS® HDAC1 Activity Assay Kit	BML-AK511	96 Reactions
FLUOR DE LYS® HDAC2 Activity Assay Kit	BML-AK512	96 Reactions
FLUOR DE LYS® HDAC3/NCOR1 Activity Assay Kit	BML-AK531	96 Reactions
FLUOR DE LYS® HDAC6 Activity Assay Kit	BML-AK516	96 Reactions
FLUOR DE LYS® HDAC8 Activity Assay Kit	BML-AK518	96 Reactions
FLUOR DE LYS® SIRT1 Drug Discovery Kit	BML-AK555	96 Reactions
FLUOR DE LYS® SIRT2 Drug Discovery Kit	BML-AK556	96 Reactions
FLUOR DE LYS® SIRT3 Drug Discovery Kit	BML-AK557	96 Reactions
FLUOR DE LYS® SIRT5 Drug Discovery Kit	BML-AK513	96 Reactions
FLUOR DE LYS® Green SIRT5 Drug Discovery Kit	BML-AK514	96 Reactions

#### Monitor intracellular deacetylase activity over a wide range of cell densities



FLUOR DE LYS® Substrate Deacetylation at Two Cell Densities. HeLa cells were seeded at either  $0.5 \times 10^4$  (30% confluence) or  $2 \times 10^4$  (80% confluence) cells per well and grown two days to the indicated confluences. Cells were then incubated with 200  $\mu\text{M}$  FLUOR DE LYS® Substrate, +/- 1  $\mu\text{M}$  Trichostatin A (BML-GR309), and fluorescence was determined as described in product manual (AFU = Arbitrary Fluorescence Units, CytoFluor II, PerSeptive Biosystems, Ex. 360 nm, Em. 460 nm, Gain 85).

#### A cell-permeable substrate for detection of intracellular HDAC activity



#### Citations

1. F.W. Peng, *et al.*; *Bioorg. Med. Chem. Lett.* (2015)
2. J.T. Pai, *et al.*; *Molecules.* (2015)
3. D.H. Nguyen-Tran, *et al.*; *Dis. Model Mech.* (2014)
4. Q. Tan, *et al.*; *Bioorg. Med. Chem.* 22, 358 (2014)
5. E. Marastoni, *et al.*; *Bioorg. Med. Chem. Lett.* 23, 4091 (2013)
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7. W. Guerrant, *et al.*; *Bioorg. Med. Chem. Lett.* 23, 3283 (2013)
8. D. Huang, *et al.*; *Eur. J. Med. Chem.* 52, 111 (2012)
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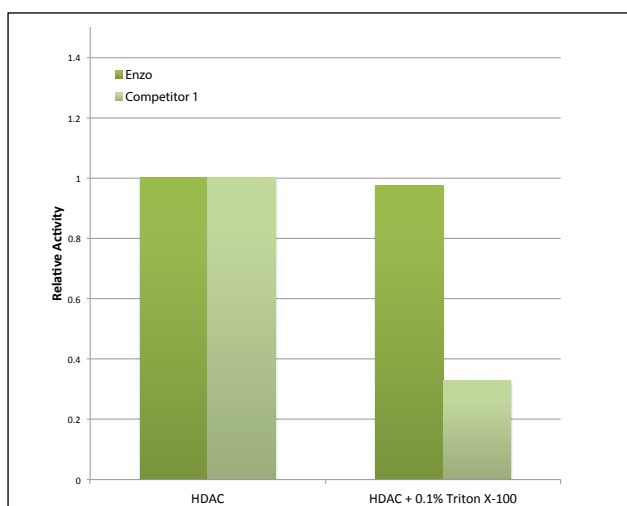
## Simplicity Delivered

### COLOR DE LYS® HDAC Colorimetric Activity Assay Kit

COLOR DE LYS® assay is designed to measure HDAC activity in cell or nuclear extracts, immunoprecipitates, or purified enzymes. The included HeLa nuclear extract can be used as a positive control, or as a source of HDAC1 and 2 for use in inhibitor screening.

- Simple two-step protocol with < 1 hour time to results
- Colorimetric readout at 405 nm compatible with most plate readers
- Resistant to detergent interference common to antibody-based assays
- Eliminates need for radioactivity, extractions, and/or chromatography
- Suitable for high-throughput analysis

#### Minimize Interference from Lysis Detergents



#### Our COLOR DE LYS® HDAC Colorimetric Assay is Less Sensitive to Detergents than Competitive Antibody-Based Assays.

HeLa nuclear extract (8.3 µg) was added to the substrate and buffer recommended by the manufacturer in the presence or absence of 0.1% Triton X-100®. After 1 hour at 37°C, the reaction was stopped and processed as recommended by the manufacturer.

Triton X-100® showed little or no effect on the COLOR DE LYS® reaction, but caused an apparent 70% inhibition of the antibody-based assay.

## PRODUCT LISTING

Product Name	Product #	Size
COLOR DE LYS® HDAC Colorimetric Activity Assay Kit	BML-AK501	96 Reactions

## Citations

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2. L. Han, *et al.*; Bioorg. Med. Chem. 22, 1529 (2014)
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7. G.L. Gravina, *et al.*; Endocr. Relat. Cancer 20, 321 (2013)
8. M.A. Suter, *et al.*; FASEB J. 26, 5106 (2012)
9. I.M. Munoz, *et al.*; J. Biol. Chem. 287, 32346 (2012)
10. A. Druz, *et al.*; Nucleic Acids Res. 40, 7291 (2012)

## HDAC AND SIRTUIN

Enzo Life Sciences provides a comprehensive offering of widely cited active HDAC and Sirtuin proteins.

ACTIVE ENZYMES - HDAC AND SIRTUIN		
Product Name	Product #	Size
HDAC (rat liver)	ALX-202-052	2 mL
HDAC1 (human) (recombinant) (His-tag)	BML-SE456	50 µg
HDAC2 (full-length) (human) (recombinant) (His-tag)	BML-SE533	50 µg
HDAC2 (human) (1-488) (recombinant) (His-tag)	BML-SE500	50 µg
HDAC3 (human) (recombinant) (His-tag)	BML-SE507	50 µg
HDAC3 / NCOR1 complex (human) (recombinant)	BML-SE515	50 µg
HDAC6 (human) (recombinant) (His-tag)	BML-SE508	50 µg
HDAC8 (human) (recombinant)	BML-SE145	100 U
HDAC10 (human) (recombinant) (His-tag)	BML-SE559	50 µg
HDAC11 (human) (recombinant) (His-tag)	BML-SE560	50 µg
SIRT1 (human) (recombinant) (His-tag)	BML-SE239	100 U
SIRT2 (human) (recombinant) (His-tag)	BML-SE251	500 U
SIRT3 (human) (recombinant) (His-tag)	BML-SE270	500 U
SIRT5 (human) (recombinant) (His-tag)	BML-SE555	50 KU

SUBSTRATES - HDAC AND SIRTUIN		
Product Name	Product #	Size
FLUOR DE LYS® Deacetylase Substrate	BML-KI104	50 µL
FLUOR DE LYS® H4-AcK16 Deacetylase Substrate	BML-KI174	0.5 µmol
FLUOR DE LYS® HDAC8 Deacetylase Substrate	BML-KI178	0.5 µmol
FLUOR DE LYS® SIRT1 Deacetylase Substrate	BML-KI177	0.5 µmol
FLUOR DE LYS® SIRT2 Deacetylase Substrate	BML-KI179	0.5 µmol
FLUOR DE LYS®-Green Substrate	BML-KI572	50 µL
FLUOR DE LYS®-Succinyl, Desuccinylase Substrate	BML-KI590	50 µL
FLUOR DE LYS®-Succinyl Green, Desuccinylase Substrate	BML-KI591	50 µL
FLUOR DE LYS® Developer Concentrate	BML-KI105	300 µL
FLUOR DE LYS® Developer II	BML-KI176	1.25 mL

SUBSTRATE PREFERENCES FOR HDAC AND SIRTUIN ENZYMES												
Substrate	HDAC							HeLa Nuclear Extract	Sirtuin			
	1	2	3	6	8	10	11		1	2	3	5
FLUOR DE LYS® Deacetylase Substrate	+++	++	++++	++	+	++++	++	++	+	+	+	+
FLUOR DE LYS® H4-AcK16	+++	+++	++++	+++++	+++	n.d.	+++	+++	++++	+++	+	+++
FLUOR DE LYS® HDAC8	++++	+++++	++++	+++++	+++++	n.d.	+++++	+++++	+++	++++	+++	+++++
FLUOR DE LYS® SIRT1	+++++	+++++	+++++	+++++	+	+++++	+++++	+++++	+++++	+++++	+++	+++++
FLUOR DE LYS® SIRT2	+++	++++	++++	++++	++	+	+	++++	++	+++++	+++++	++++
FLUOR DE LYS® Substrate Concentration	5 µM	5 µM	50 µM	50 µM	25 µM	25 µM	5 µM	25 µM	25/500 µM	25 µM	10 µM	500 µM

## High-throughput Assay for Detection of LSD1 Modulators

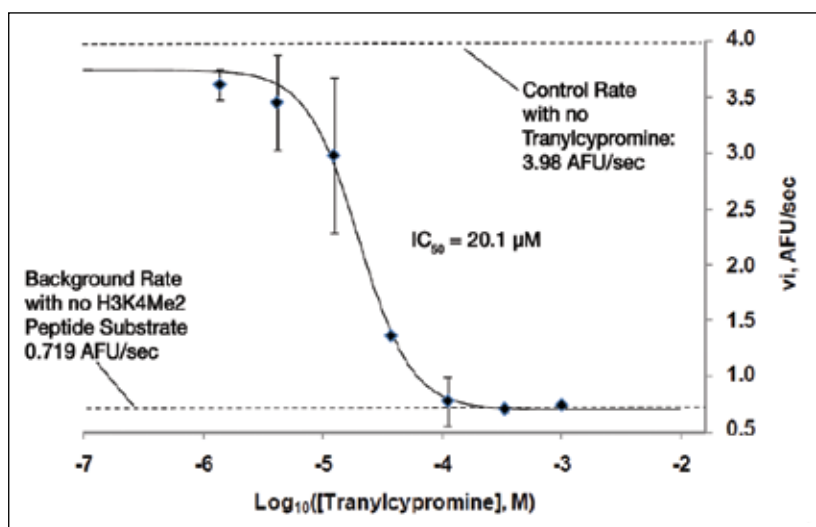
### LSD1 Fluorometric/Colorimetric Drug Discovery Kit

#### A CELLESTIAL® Red Hydrogen Peroxide Assay System

The LSD1 Fluorometric Drug Discovery Kit provides all necessary reagents for measuring human LSD1 activity in a sensitive, real-time fluorescent or colorimetric assay. LSD1 is inhibited by a number of established monoamine oxidase inhibitor drugs, including tranylcypromine. That and the fact that its expression is elevated in a number of cancers may make it a promising target for drug development.

- CELLESTIAL® Red Substrate allows real-time fluorometric or colorimetric detection
- Single-step, homogeneous assay ideal for high-throughput screening applications
- 1000 U of LSD1 supplied with each kit

#### High Sensitivity Assay for Measuring Demethylation Efficiency



#### Easily Detect Inhibitors of LSD1

Tranylcypromine Inhibition of LSD1. LSD1 enzyme (0.1 µg/µL) was incubated with the indicated concentrations of tranylcypromine for 30 minutes at room temperature (23°C). Samples (0.5 µg, 5 µL) were then transferred to wells for the demethylation assay with 20 µM H3K4Me2 peptide. Fluorescence was measured at 47 sec intervals on a CytoFluor™ II fluorescence plate reader (PerSeptive Biosystems, Ex. 530 nm, Em. 590 nm, Gain = 60).

#### RELATED PRODUCTS

Product Name	Product #	Size
LSD1 Fluorometric/Colorimetric Drug Discovery Assay	BML-AK544	96 Reactions
LSD1 (KDM1) (human, recombinant)	BML-SE544	50 µg
Histone H3 dimethyl lysine-4 peptide	BML-P256	0.5 mg

#### ACETYLTRANSFERASE/METHYLTRANSFERASE ACTIVITY ASSAYS

Product Name	Product #	Size
Acetyltransferase Activity Kit	ADI-907-026	96 Reactions
Methyltransferase Activity Kit	ADI-907-025	96 Reactions
Methyltransferase HT Activity Kit	ADI-907-032	96 Reactions

# SUMOylation

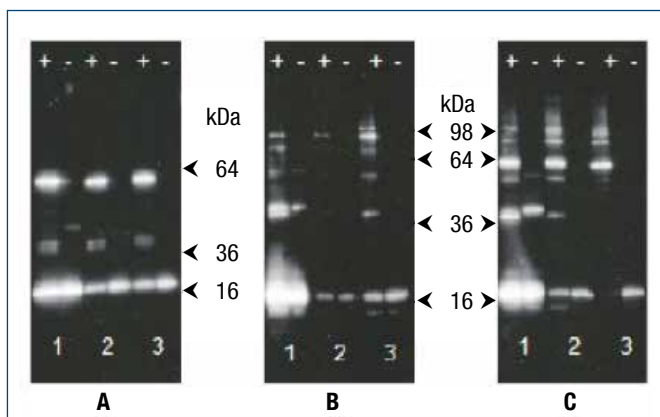
## Modify and Detect With Ease

### SUMOylation Kit

Most highly cited kit for generation of SUMOylated proteins *in vitro*

- Fastest assay time on the market, just under 1.5 hour to answer
- Simple 4-step assay: **Mix** → **Incubate** → **Quench** → **Results**
- Versatile kit with multiple applications including:
  - Investigate sumoylation effect on enzyme activity or regulation of cellular processes
  - Identify novel proteins that are targets for SUMOylation
  - Generate substrates for deSUMOylating enzymes

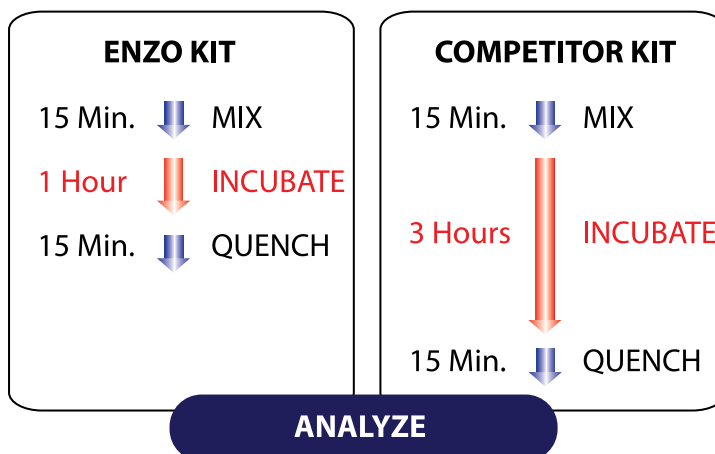
This kit provides a means of generating SUMOylated proteins *in vitro*, by covalent linkage of the carboxy-terminal of SUMO-1, -2 or -3 to specific lysine residues on the target protein via isopeptide bonds, using the SUMOylation enzyme cascade. A control target protein is provided together with all other necessary components. SUMO-specific antibodies are provided for detection of SUMOylated proteins via SDS-PAGE and Western blotting.



### SUMOylate and Detect a Broad Range of Target Proteins

Western Blot of SUMOylation Assays for RANGAP1 control target and SP100/p53 target proteins. Assays set-up and run as described in "Assay Protocol." SUMOylated proteins were detected by Western Blotting on SUMOylation assays containing on Figure A: RANGAP1 (Prod. No. BML-UW9755), Figure B: p53 (Prod. No. BML-FW9370) and Figure C: SP100 (Prod. No. BML-UW9825) target proteins with 1: SUMO1 (Prod. No. BML-UW9195), 2: SUMO2 (Prod. No. BML-UW9205) and 3: SUMO3 (Prod. No. BML-UW9215) substrates using the appropriate SUMO antibody (1: Prod. No. BML-PW9460, 2/3: Prod. No. BML-PW9465) as described in "Analysis by Western Blotting."

### Enzo's Kit Modifies & Detects SUMOylation in One-third of the Time



### Citations

1. M. Bermúdez-López, *et al.*; PLoS Biol 13, e1002089 (2015)
2. H. Ramachandran, *et al.*; PLoS One 10, e0130275 (2015)
3. T. Kobayashi, *et al.*; Oncogene 34, 2251 (2014)
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7. S.S. Myatt, *et al.*; Oncogene 33, 4316 (2014)
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9. I.N. Soares, *et al.*; Mol. Cell. Proteomics 12, 3253 (2013)
10. A. Ahner, *et al.*; Mol. Biol. Cell 2, 74 (2013)

<b>PRODUCT LISTING</b>		
<b>SUMO Assay Kits</b>		
<b>Product Name</b>	<b>Product #</b>	<b>Size</b>
SUMOylation Kit	BML-UW8995	20 Reactions
SUMO-QAPTURE-T® Kit	BML-UW1000A	10 Reactions
POLYSUMO-QAPTURE® Kit	BML-UW0955	10 Reactions

<b>PRODUCT LISTING</b>		
<b>SUMO Proteins</b>		
<b>Product Name</b>	<b>Product #</b>	<b>Size</b>
SP100 fragment (human) (recombinant) (GST-tag)	BML-UW9825	100 µg
SUMO activating enzyme E1 (human) (recombinant) (His-tag)	BML-UW9330	25 µg
Poly-SUMO-2 chains	BML-UW9670	25 µg
Poly-SUMO-2 chains	BML-UW9675	25 µg
SUMO-1 (human) (1-097), (recombinant)	ALX-201-045	500 µg
SUMO-1 (human) (1-101), (recombinant)	ALX-201-044	250 µg
SUMO-1 (human) (recombinant) (agarose-immobilized)	BML-UW0095	0.5 mL
SUMO-1 (human) (recombinant) (biotin conjugate)	BML-UW0545	100 µg
SUMO-1 (human) (recombinant) (GST-tag)	BML-UW0160	500 µg
SUMO-1 (human) (recombinant) (His-tag)	BML-UW9195	500 µg
SUMO-1 [E93R] (human) (recombinant) (GST-tag)	BML-UW0175	100 µg
SUMO-1 activating enzyme (human), (recombinant)	ALX-201-090	10 µg
SUMO-1 pro (human) (recombinant) (His-tag)	BML-UW9190	500 µg
SUMO-1-AMC	BML-UW0040	50 µg
SUMO-2 (human) (1-93) (recombinant)	ALX-201-089	500 µg
SUMO-2 (human) (1-95) (recombinant)	ALX-201-088	250 µg
SUMO-2 (human) (recombinant) (GST-tag)	BML-UW0165	500 µg

# UBIQUITINYLATION

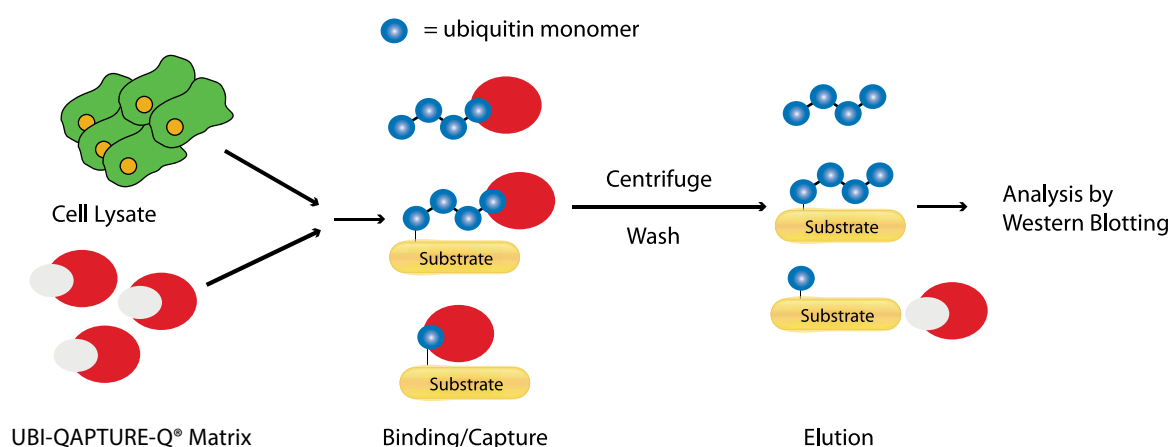
## Qapture the Full Range of Ubiquitin-protein Conjugates

### UBI-QAPTURE-Q® Kit

For isolation and enrichment of mono- and poly-ubiquitylated proteins

- Superior binding characteristics unlike other commercially available kits which only capture long polyubiquitin chain-conjugated proteins
- Provides high efficiency performance with minimal non-specific binding
- Compatible with a wide range of lysate buffers and cell/tissue samples from a variety of species

#### Easy 3-Step Process: Capture, Concentrate, and Detect



## PRODUCT LISTING

### UBIQUITIN ASSAY KITS

Product Name	Product #	Size
UBI-QAPTURE-Q® Kit	BML-UW8995	20 x 20 µL
Auto-Ubiquitylation Kit	BML-UW0970	10 Reactions
NEDDylation Kit	BML-UW0590	20 Reactions
Ubiquitin Activating Kit	BML-UW0400A	96 Reactions
Ubiquitin Conjugating Kit (HeLa lysate-based)	BML-UW9915	20 x 50 µL
Ubiquitylation Kit	BML-UW9920	50 x 50 µL

## Citations

1. N. Platonova, *et al.*; *Genes Chromosomes Cancer* (2015)
2. S. Delogu, *et al.*; *Oncotarget* 6, 2222 (2015)
3. D. Sosnowska, *et al.*; *J Gerontol A Biol Sci Med Sci* 69, 1448 (2014)
4. P. Chandrasekaran, *et al.*; *PLoS One* 9, e86998 (2014)
5. J.H. Yoon, *et al.*; *EMBO Mol. Med.* 5, 1720 (2013)
6. J. Shen, *et al.*; *Arthritis Rheum.* 65, 3107 (2013)
7. S. Gourguechon, *et al.*; *J. Cell Sci.* 126, 2246 (2013)
8. H. Zhang, *et al.*; *J. Biol. Chem.* 288, 22359 (2013)
9. M. Kästle, *et al.*; *Free Radic. Biol. Med.* 53, 1468 (2012)

## PRODUCT LISTING

### UBIQUITIN AND UBIQUITIN-LIKE PROTEINS

Product Name	Product #	Size	Product Name	Product #	Size
[[K <sup>11</sup> -only]Ub)n-ubiquitinylated substrate	BML-UW0620	25 µg	Ubiquitin (biotinylated)	BML-UW8705	100 µg
[[K <sup>27</sup> -only]Ub)n-ubiquitinylated substrate	BML-UW0625	25 µg	Ubiquitin (bovine) (native) (methylated)	BML-UW8555	1 mg
[[K <sup>29</sup> -only]Ub)n-ubiquitinylated substrate	BML-UW0630	25 µg	Ubiquitin (human) (fluorescein labeled)	BML-UW1240	100 µg
[[K <sup>33</sup> -only]Ub)n-ubiquitinylated substrate	BML-UW0635	25 µg	Ubiquitin (human) (recombinant)	BML-UW0280	1 mg
[[K <sup>48</sup> -only]Ub)n-ubiquitinylated substrate	BML-UW0640	25 µg	Ubiquitin (human) (recombinant) (GST-tag)	BML-UW8620	1 mg
[[K <sup>6</sup> -only]Ub)n-ubiquitinylated substrate	BML-UW0615	25 µg	Ubiquitin (human) (recombinant) (His-tag)	BML-UW8610	1 mg
[[K <sup>63</sup> -only]Ub)n-ubiquitinylated substrate	BML-UW0645	25 µg	Ubiquitin [D77] (human) (recombinant) (untagged)	BML-UW0345	1 mg
[(N $\epsilon$ -biotinyl)Lys <sup>6</sup> , (N $\epsilon$ -biotinyl)Lys <sup>48</sup> ]Ubiquitin	BML-UW8475	100 µg	Ubiquitin [K <sup>06R</sup> ] (human) (recombinant) (untagged)	BML-UW0245	1 mg
[(N $\epsilon$ -biotinyl)Lys <sup>6</sup> , (N $\epsilon$ -biotinyl)Lys <sup>63</sup> ]Ubiquitin	BML-UW8480	100 µg	Ubiquitin [K <sup>11R</sup> ] (human), (recombinant) (untagged)	BML-UW0250	1 mg
[(N $\epsilon$ -biotinyl)Lys <sup>6</sup> ]Ubiquitin	BML-UW8470	100 µg	Ubiquitin [K <sup>27R</sup> ] (human) (recombinant) (untagged)	BML-UW0255	1 mg
Chloroethyl ubiquitin (HA-tag)	BML-UW0885	25 µg	Ubiquitin [K <sup>29R</sup> ] (human) (recombinant) (untagged)	BML-UW0260	1 mg
Deca-ubiquitin (linear)	BML-UW0815	100 µg	Ubiquitin [K <sup>33R</sup> ] (human) (recombinant) (untagged)	BML-UW0265	1 mg
Di-ubiquitin (K <sup>48</sup> -linked)	BML-UW9800	100 µg	Ubiquitin [K <sup>63R</sup> ] (human) (recombinant) (untagged)	BML-UW0275	1 mg
Di-ubiquitin (K <sup>63</sup> -linked)	BML-UW0730	50 µg	Ubiquitin [K <sup>allR</sup> ] (human) (recombinant) (untagged)	BML-UW0205	1 mg
Di-ubiquitin (linear)	BML-UW0775	100 µg	Ubiquitin activating enzyme E1 (human) (recombinant) (His-tag)	BML-UW9410	50 µg
Hepta-ubiquitin (linear)	BML-UW0800	100 µg	Ubiquitin aldehyde (recombinant)	BML-UW8450	50 µg
Hexa-ubiquitin (linear)	BML-UW0795	100 µg	Ubiquitin binding entities, sampler pack	BML-UW0120	1 Pack
Linear polyubiquitin chains sampler pack	BML-UW0825	1 Pack	Ubiquitin K <sup>06</sup> -only (human) (recombinant) (untagged)	BML-UW0210	1 mg
NEDD8 pro (human) (recombinant) (GST-tag)	BML-UW8740	100 µg	Ubiquitin K <sup>11</sup> -only (human) (recombinant) (untagged)	BML-UW0215	1 mg
NEDD8 pro (human) (recombinant) (His-tag)	BML-UW9220	500 µg	Ubiquitin K <sup>27</sup> -only (human) (recombinant) (untagged)	BML-UW0220	1 mg
Nona-ubiquitin (linear)	BML-UW0810	100 µg	Ubiquitin K <sup>29</sup> -only (human) (recombinant) (untagged)	BML-UW0225	1 mg
Octa-ubiquitin (linear)	BML-UW0805	100 µg	Ubiquitin K <sup>33</sup> -only (human) (recombinant) (untagged)	BML-UW0230	1 mg
Penta-ubiquitin (linear)	BML-UW0790	100 µg	Ubiquitin K <sup>48</sup> -only (human) (recombinant) (untagged)	BML-UW0235	1 mg
Poly-ubiquitin chains (Ub <sub>2-16</sub> ) (K <sup>48</sup> -linked)	BML-UW0670	100 µg	Ubiquitin K <sup>63</sup> -only (human) (recombinant) (untagged)	BML-UW0240	1 mg
Poly-ubiquitin chains (Ub <sub>2-7</sub> ) (K <sup>63</sup> -linked)	BML-UW9570	100 µg	Ubiquitin vinyl methyl ester (HA-tag)	BML-UW0880	25 µg
Polyubiquitin chains Ub <sub>2-7</sub> (linear) (recombinant)	BML-UW1010	100 µg	Ubiquitin vinyl sulfone, (HA-tag)	BML-UW0155	25 µg
Tetra-ubiquitin (K <sup>48</sup> -linked)	BML-UW8645	25 µg	Ubiquitin-Rhodamine	BML-SE761	25 µg
Tetra-ubiquitin (linear)	BML-UW0785	100 µg	Ubiquitin <sup>+1</sup> (recombinant) (His-tag)	BML-UW8790	100 µg
Tri-ubiquitin (linear)	BML-UW0780	100 µg	Ubiquitin <sub>5</sub> <sup>+1</sup> (recombinant) (His-tag)	BML-UW8855	25 µg
Ubc9 (human) (recombinant) (untagged)	BML-UW9320	100 µg	Ubiquitin-conjugating enzyme sampler pack	BML-UW8975	1 Pack
UbcH1 (human) (recombinant) (His-tag)	BML-UW9020	100 µg	Ubiquitin-conjugating enzyme sampler pack	BML-UW8975	1 Pack
Ubiquitin	BML-UW8795	5 mg	Ubn-ubiquitinylated substrate	BML-UW0610	25 µg
Ubiquitin (agarose-immobilized)	BML-UW8630	0.5 mL			



# EPIGENETIC ACTIVATORS AND INHIBITORS

## Benchmark Against Known Epigenetic Modulators

### Epigenetics Compound Library

The SCREEN-WELL® Epigenetics library is a curated set of compounds with defined activity against epigenetic modulating enzymes. It is a convenient tool for use with HDAC and Sirtuin drug discovery kits:

- Contains 43 compounds with defined activity against lysine-modifying enzymes and DNA methylation
- Available in 100 µL and 500 µL formats, dissolved in DMSO
- Includes a variety of structurally and mechanistically different compound classes targeting HDACs, SIRTs, HATs, HMTs, DNMTs, and Lysine demethylases

COMPOUND LIBRARY		
Product Name	Product #	Size
SCREEN-WELL® Epigenetics Library	BML-2836	100 µg/well, 500 µg/well

We offer a diverse collection of Epigenetic pathway targeting compounds.

HDAC INHIBITORS			
Product Name	Product #	Activity	Size
Apicidin	BML-GR340	HDAC inhibitor	1 mg, 5 mg
BML-210	BML-GR330	HDAC inhibitor	1 mg, 5 mg
BML-281	BML-GR361	HDAC6 inhibitor	1 mg, 5 mg
Depudecin	BML-EI319	HDAC inhibitor	100 µg
HC Toxin	BML-GR320	HDAC inhibitor	1 mg
ITSA-1	BML-GR350	HDAC inhibitor	25 mg, 100 mg
M344	ALX-270-297	HDAC inhibitor	1 mg, 5 mg
MC1293	ALX-270-344	HDAC1 inhibitor	5 mg
Niltubacin	BML-GR363	HDAC inhibitor	100 µg, 500 µg
Nullscript	BML-GR327	HDAC inhibitor	1 mg, 5 mg
Oxamflatin	ALX-270-379	HDAC inhibitor	1 mg, 5 mg
Parthenolide	BML-T113	HDAC inhibitor	50 mg, 250 mg
Phenylbutyrate sodium	BML-EI320	HDAC inhibitor	1 g
Scriptaid	BML-GR326	HDAC inhibitor	1 mg, 5 mg
Sodium butyrate	ALX-270-301	HDAC inhibitor. Apoptosis inducer.	1 g
Splitomicin	BML-GR331	HDAC inhibitor	5 mg, 25 mg
Suberoyl bis-hydroxamic acid	BML-GR323	HDAC inhibitor	100 µg, 500 µg
Trichostatin A	BML-GR309	HDAC inhibitor	1 mg, 5 mg
Trichostatin C	ALX-280-239	HDAC inhibitor	0.5 mg
Tubacin	BML-GR362	HDAC inhibitor	100 µg, 500 µg

SIRT MODULATORS			
6-Chloro-2,3,4,9-tetrahydro-1H-carbazole-1-carboxamide	ALX-270-437	SIRT inhibitor	1 mg
Aristoforin	ALX-350-129	SIRT inhibitor	1 mg
BML-266	BML-GR346	SIRT inhibitor	10 mg, 50 mg
BML-278	BML-GR359	SIRT activator	5 mg, 25 mg
Resveratrol	BML-FR104	Antioxidant. SIRT1 activator.	100 µg, 500 µg
Sirtinol	ALX-270-308	SIRT inhibitor	1 mg, 5 mg, 25 mg
Triacetyl resveratrol	BML-FR119	SIRT activator	10 mg, 50 mg

OTHER EPIGENETIC MODULATORS			
Product Name	Product #	Activity	Size
(-)-Epigallocatechin gallate	ALX-270-263	Inhibitor of NOS, telomerase and DNMT	10 mg, 50 mg
AGK2	ALX-270-484	SIRT2 inhibitor	1 mg, 5 mg
B2	ALX-270-485	SIRT2 inhibitor	0.5 mg
beta-Rubromycin	ALX-380-067	Inhibitor of HIV-1 reverse transcriptase and human telomerase	1 mg, 5 mg
Betulinic acid (High Purity)	ALX-350-277	Antitumor and anti-HIV agent	5 mg, 25 mg, 100 mg
Betulinic acid 1	ALX-350-298	Proteasome activator	0.1 mg, 0.5 mg, 1 mg
BIX 01294	ALX-270-473	G9a histone methyltransferase inhibitor	2 mg, 10 mg
BML-282	BML-EI400	UCH inhibitor	5 mg
BPPA	BML-GR321	Telomerase inhibitor	25 mg
Butein	ALX-350-246	Tyrosine kinase inhibitor	10 mg
Butyrolactone 3	ALX-270-411	Inhibitor of histone acetyltransferase Gcn5	5 mg
Celastrol	ALX-350-332	Anti-inflammatory and immunosuppressive	5 mg, 25 mg
Chaetocin	BML-GR349	Methyltransferase inhibitor	200 µg
clasto Lactacystin β-Lactone	BML-PI108	Proteasome inhibitor	100 µg
Compound A	ALX-550-516	Glucocorticoid receptor modulator	5 mg, 25 mg
CTPB	ALX-420-033	p300 HAT activator	1 mg, 5 mg
Curcumin (high purity)	ALX-350-028	Inhibitor of Lipoxygenase and COX	10 mg, 50 mg, 250 mg
Epoxomicin	BML-PI127	Key inhibitor for use in proteasome research.	100 µg
Garcinol	BML-GR343	HAT inhibitor	10 mg, 50 mg
Glilotoxin	BML-PI129	Proteasome inhibitor	2 mg, 10 mg
Hypothemycin	ALX-380-116	MEK inhibitor	250 µg, 1 mg
Kendomycin	ALX-380-066	Endothelin receptor antagonist	500 µg
Lactacystin (native)	ALX-350-245	Proteasome inhibitor	100 mg, 500 mg, 1g
Nutlin03	ALX-430-128	Inhibitor of p53/MDM2 interaction	1 mg, 5 mg, 25 mg
O6-Benzylguanine	ALX-480-019	DNA alkyltransferase substrate and inhibitor	10 mg
Piceatannol	ALX-270-202	Syk inhibitor. SIRT1 activator.	1 mg, 5 mg, 50 mg
Pristimerin	ALX-350-411	Antitumor agent	5 mg, 25 mg
Quercetin . dihydrate	ALX-385-001	Antioxidant flavonoid	5 g, 25 g
Sinefungin	ALX-380-070	Methyltransferase inhibitor	1 mg, 5 mg
Suramin . hexasodium salt	ALX-430-022	Purinergic receptor inhibitor	50 mg, 250 mg, 1 g
TCID	BML-EI399	UCH-L3 inhibitor	10 mg, 50 mg
Thielavin B	ALX-350-340	Inhibitor of Glucose-6-phosphatase and PLC	0.5 mg
Tranylcypromine	BML-EI217	Demethylase inhibitor	1 g, 5 g
Valproic acid . sodium salt	ALX-550-304	Anti-convulsant and anti-depressant	5 g
Zebularine	BML-GR344	DNMT inhibitor	10 mg

### ELISA-Based Detection

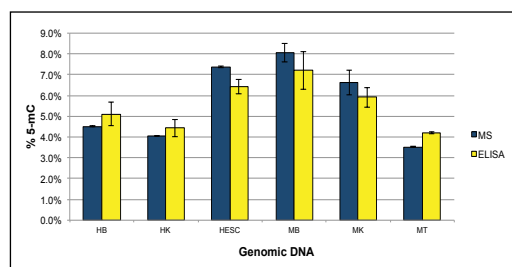
#### Convenient Kits for Sample Conversion & Detection

DNA methylation can alter gene expression and cell differentiation, often resulting in unidirectional changes to genomic DNA. Its involvement in so many cellular processes may lead to errors resulting in abnormal DNA methylation patterns which can lead to disease. Expanding our expertise in epigenetic modification analysis, Enzo Life Sciences now offers a portfolio of products that enable detection of DNA methylation which includes 5-Methylcytosine and 5-Hydroxymethylcytosine DNA ELISA kits.

#### 5-Methylcytosine DNA ELISA Kit (ADI-900-224)

- Accurately quantitate 5-mC in any DNA sample in < 3 hours
- Ideal for high-throughput analysis
- High specificity comparable to LC-MS/MS-MRM analysis

#### ELISA Results Closely Correlate to Mass Spectrometry Analysis



Genomic DNA Mass Spectrometry versus ELISA analysis: The 5-methylcytosine DNA ELISA kit (Prod. # ADI-900-224) quantifies 5-mC in numerous DNA samples with close correlation to LC-MS/MS-MRM analysis. Genomic DNA samples include: human brain (HB), human kidney (HK), human embryonic stem cell (HESC), mouse brain (MB), mouse kidney (MK), and mouse testes (MT).

#### SELECT ELISAS FOR EPIGENETIC RESEARCH

Product Name	Product #	Size	Sensitivity (Range)	Species	Sample Types	Assay Time
5-Methylcytosine DNA ELISA Kit	ADI-900-224	1x96 Well	~0.5% 5-methylcytosine per 100ng single-stranded DNA (5-100% (100 ng/μL))	Species independent	DNA	< 3 Hours
5-Hydroxymethylcytosine DNA ELISA Kit	ADI-900-225	1x96 Well	<0.02% 5-hydroxymethylcytosine DNA per 100ng input DNA (0.03-0.55% (100 ng/μL))	Species independent	DNA	< 3 Hours

# ANTIBODIES FOR DETECTING EPIGENETIC CHANGES

## UBIQUITIN AND UBIQUITIN MODIFICATION ANTIBODIES

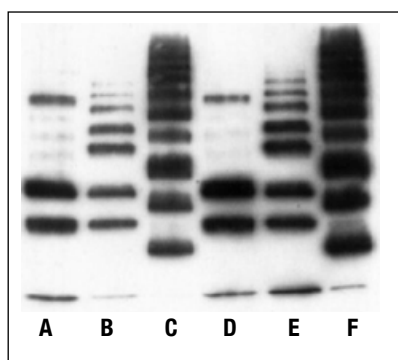
### Go For the Gold!

#### Mono- and Poly-ubiquitinated Conjugates (FK2)

The gold standard antibody for detection of ubiquitinated proteins

- Detect K<sup>29</sup>-, K<sup>48</sup>-, and K<sup>63</sup>-linked mono- and poly-ubiquitinated proteins
- Most cited multi-ubiquitin antibody with over 500 citations
- Validated for WB, IP, IHC and ELISA applications
- Available as HRP, biotin, ATTO 488, and FITC conjugates

This monoclonal antibody to Mono- and Poly-ubiquitinated Conjugates (FK2) has been extensively characterized by one-dimensional Western blotting and has been shown to recognize K<sup>29</sup>-, K<sup>48</sup>-, and K<sup>63</sup>-linked mono- and poly-ubiquitinated proteins but not free ubiquitin. It has been used for a wide range of applications including immunoprecipitation, ELISA and Western blot. FK2 is available with a variety of labels to meet your specific research needs.



#### The FK2 clone has been validated for a variety of applications including Western Blot analysis

Western blot of multi-ubiquitin chains using mAb to Poly-ubiquitinated Conjugates (FK1) (Prod. No. BML-PW8805) (lanes A-C) and mAb to Mono- and Poly-ubiquitinated Conjugates (FK2) (Prod. No. BML-PW8810) (lanes D-F). Lanes A & D: K<sup>48</sup>-linked chains. Lanes B & E: K<sup>29</sup>-linked chains. Lanes C & F: K<sup>63</sup>-linked chains.

#### Citations:

1. F. A. Wright, *et al.*; J. Biol. Chem. (2015)
2. S. Kobayashi, *et al.*; PNAS (2015)
3. D.S. Pitcher, *et al.*; EBioMedicine 2, 642 (2015)
4. W.N. Wilson, *et al.*; Comp. Biochem. Physiol. A Mol. Integr. Physiol. 183, 27 (2015)
5. T. Thorslund, *et al.*; Nature 10, 1038 (2015)
6. J.A. Awuh, *et al.*; PNAS (2015)
7. S.S. Kharat, *et al.*; Oncogene (2015)
8. K.K. Raval, *et al.*; J. Biol. Chem. 290, 3121 (2015)
9. A. Zlatanou, *et al.*; Oncogene (2015)
10. M. Watanabe, *et al.*; Toxicology 322, 43 (2014)

### UBIQUITIN-REACTIVE ANTIBODIES

Product Name	Product #	Size
Mono- and polyubiquitinated conjugates monoclonal antibody (FK2) (fluorescein labeled)	BML-PW1210	25 µL
Mono- and polyubiquitinated conjugates monoclonal antibody (FK2)	BML-PW8810	500 µg
Mono- and polyubiquitinated conjugates monoclonal antibody (FK2) (ATTO 488 conjugate)	BML-PW1335	25 µL
Mono- and polyubiquitinated conjugates monoclonal antibody (FK2) (HRP conjugate)	BML-PW0150	100 µg
Mono- and polyubiquitinated conjugates monoclonal antibody (FK2) (biotin conjugate)	BML-PW0755	25 µL
Polyubiquitinated conjugates monoclonal antibody (FK1)	BML-PW8805	500 µg
Polyubiquitin (K <sup>63</sup> -linkage-specific) monoclonal antibody (HWA4C4)	BML-PW0600	25 µL
Polyubiquitin (K <sup>63</sup> -linkage-specific) monoclonal antibody (HWA4C4) (HRP conjugate)	BML-PW0605	100 µg
Ub <sup>+1</sup> polyclonal antibody	BML-PW9780	25 µL
Ubiquitin monoclonal antibody (EX-9)	BML-PW0580	100 µL
Ubiquitin monoclonal antibody (EX-9) (fluorescein labeled)	BML-PW1225	25 µL
Ubiquitin monoclonal antibody (P4D1) (HRP conjugate)	BML-PW0935	100 µL
Ubiquitin monoclonal antibody (P4G7)	ENZ-ABS142	200 µL
Ubiquitin polyclonal antibody	ADI-SPA-200	200 µg
Ubiquitin polyclonal antibody (DyLight™ 488 conjugate)	ADI-SPA-200-488	50 µg
Ubiquitin monoclonal antibody (P4G7-H11)	ADI-SPA-203	200 µg
Ubiquitin-protein conjugates polyclonal antibody (fluorescein labeled)	BML-PW1235	25 µL
Ubiquitin monoclonal antibody (P4D1)	BML-PW0930	100 µg

<b>ANTIBODIES FOR ACTIVATING ENZYMES, CONJUGATING ENZYMES, AND LIGASES</b>		
<b>Product Name</b>	<b>Product #</b>	<b>Size</b>
AMSH (human) polyclonal antibody	BML-PW0655	100 µL
CYLD (human) polyclonal antibody	BML-PW0760	100 µL
Huwe1 (mouse) polyclonal antibody	BML-PW0950	100 µL
MYSM1 (human) polyclonal antibody	BML-PW0660	100 µL
Parkin (human) polyclonal antibody	BML-PW9365	25 µL
SENP6 (human) polyclonal antibody	BML-PW0370	100 µL
SUMO-1 activating enzyme subunit SAE1 (human) polyclonal antibody	ALX-210-328	50 µg
SUMO-1 activating enzyme subunit SAE1 (human) polyclonal antibody	ALX-210-328	50 µg
UBA6 (human) polyclonal antibody	BML-PW0525	25 µL
UBA6 (human) polyclonal antibody	BML-PW0525	25 µL
Ubc9 polyclonal antibody	ALX-210-233	50 µg
UBE1L (human) polyclonal antibody	ALX-210-391	100 µL
Ubiquitin activating enzyme (CT) polyclonal antibody	BML-PW8395	25 µL
Ubiquitin activating enzyme (CT) polyclonal antibody	BML-PW8395	25 µL
Ubiquitin activating enzyme (NT) polyclonal antibody	BML-PW8385	25 µL
Ubiquitin activating enzyme polyclonal antibody	BML-PW8390	25 µL

<b>UBIQUITIN-LIKE REACTIVE ANTIBODIES</b>		
<b>Product Name</b>	<b>Product #</b>	<b>Size</b>
FAT10 polyclonal antibody	BML-PW9585	100 µL
FAT10 polyclonal antibody	BML-PW9680	100 µL
Fub1 (human) polyclonal antibody	BML-PW9615	25 µL
ISG15 (human) polyclonal antibody	BML-PW9575	100 µL
NEDD8 (human) polyclonal antibody	BML-PW9340	100 µL
NEDD8 polyclonal antibody	ALX-210-194	200 µL
Sp100 (human) polyclonal antibody	BML-PW0325	100 µL
Sp100 (SUMO modified) (human) polyclonal antibody	BML-PW0330	25 µL
SUMO-1 (human) (CT) polyclonal antibody	BML-PW9460	25 µL
SUMO-1 (human) (NT) polyclonal antibody	BML-PW8330	25 µL
SUMO-1 (human) polyclonal antibody	BML-PW0505A	25 µg
SUMO-2 (human) polyclonal antibody	BML-PW0510A	25 µg
SUMO-2/3 (human) (NT) polyclonal antibody	BML-PW9465	25 µL
Ubl5 (human) polyclonal antibody	BML-PW9605	25 µL
Urm1 (human) polyclonal antibody	BML-PW9595	25 µL
Use1 (human) polyclonal antibody	BML-PW0770	100 µL

## EPIGENETIC MODIFICATION ANTIBODIES

<b>ANTIBODIES FOR DETECTION OF UBIQUITIN AND UBIQUITIN MODIFICATIONS</b>		
<b>Product Name</b>	<b>Product #</b>	<b>Size</b>
Ubiquitin activating enzyme (NT), pAb	BML-PW8385	25 µL, 100 µL
Ubiquitin activating enzyme, pAb	BML-PW8390	25 µL, 100 µL
Ubiquitin conjugating enzyme UbcH1, pAb	BML-UG9520	25 µL, 100 µL
Ubiquitin mAb (EX9) (fluorescein-labeled)	BML-PW1225	25 µL
Ubiquitin mAb (EX9)	BML-PW0580	25 µL
Ubiquitin mAb (EX9) (HRP conjugate)	BML-PW0835	25 µL
Ubiquitin, mAb (P4D1)	BML-PW0930	100 µg, 1 mg
Ubiquitin, mAb (P4D1) (fluorescein-labeled)	BML-PW1220	25 µL
Ubiquitin, mAb (P4D1) (HRP conjugate)	BML-PW0935	25 µL, 100 µL
Ubiquitin, mAb (P4G7-H11)	ADI-SPA-203	50 µg, 200 µg
Ubiquitin, pAb	ADI-SPA-200	50 µg, 200 µg
Ubiquitin, pAb (DyLight™ 488 conjugate)	ADI-SPA-200-488	50 µg, 200 µg
Ubiquitin, pAb (PE conjugate)	ADI-SPA-200PE	50 µg, 200 µg
Ubiquitin-protein conjugates pAb (fluorescein-labeled)	BML-PW1235	25 µL
Ubiquitin-protein conjugates, pAb	BML-UG9510	100 µL
Ubl5 (human), pAb	BML-PW9605	25 µL, 100 µL
Urm1 (human), pAb	BML-PW9595	25 µL
Use1 (human), pAb	BML-PW0770	25 µL, 100 µL

### **LYSINE MODIFICATIONS**

Acetylated Lysine, pAb	ADI-KAP-TF120	100 µg
Acetylated Lysine, pAb (biotin conjugate)	ADI-KAP-TF1201B	100 µg
Acetylated Lysine, pAb (HRP conjugate)	ADI-KAP-TF1203	100 µg
Acetyl-lysine, pAb	BML-SA615	100 µL
Acetyl-Lysine, pAb	BML-SA440	400 µL
Acetyl-lysine, pAb (affinity-purified)	BML-SA627	100 µL
Butyryl-lysine, pAb (affinity-purified)	BML-SA682	100 µL
Diglycyl Lysine, mAb (GX41)	ADI-908-310	100 µg
Dimethyl-lysine, pAb	BML-SA667	100 µL
Dimethyl-lysine, pAb (affinity-purified)	BML-SA668	50 µg
Methylated Lysine, pAb	ADI-KAP-TF121	100 µg
Methylated Lysine, pAb (biotin conjugate)	ADI-KAP-TF1211B	100 µg
Methylated Lysine, pAb (HRP conjugate)	ADI-KAP-TF1213	100 µg

### **SUMO PROTEINS OR MODIFICATIONS**

SUMO-1 (human) (CT), pAb	BML-PW9460	25 µL, 100 µL
SUMO-1 (human) (NT), pAb	BML-PW8330	25 µL, 100 µL
SUMO-1 (human), pAb	BML-PW0505	25 µL, 100 µL
SUMO-1 activating enzyme subunit SAE1 (human), pAb	ALX-210-328	50 µg
SUMO-2 (human), pAb	BML-PW0510	25 µL, 100 µL
SUMO-2/3 (human) (NT), pAb	BML-PW9465	25 µL, 100 µL
SEN6 (human), pAb	BML-PW0370	25 µL, 100 µL
Sp100 (human), pAb	BML-PW0325	25 µL, 100 µL
Sp100 (SUMO-modified) (human), pAb	BML-PW0330	25 µL, 100 µL

## EPIGENETIC MODIFICATION ANTIBODIES

### ANTIBODIES FOR DETECTION OF:

#### DNA METHYLATION

Product Name	Product #	Size
Dnmt1, mAb	ALX-804-369	100 µg
Dnmt3a (mouse), mAb	ALX-804-370	100 µg
Dnmt3b, mAb	ALX-804-233	100 µg

#### HDAC AND SIRTUIN

Product Name	Product #	Size
HDAC1, mAb	ALX-804-599	200 µg
HDAC1, pAb	BML-SA401	100 µg
HDAC2, pAb	BML-SA402	100 µg
HDAC3, pAb	BML-SA403	100 µg
HDAC4 (NT), pAb	ALX-210-339	100 µg
HDAC4, pAb	BML-SA404	100 µg
HDAC5, pAb	ALX-210-340	100 µg
HDAC6, pAb	ALX-210-341	100 µg
SIRT1 (human), pAb	BML-SA427	100 µL
SIRT2 (human), pAb	BML-SA444	100 µL
SIRT3, pAb	BML-SA463	100 µL
SIRT5, pAb	BML-SA464	100 µL
Sirtuin 6 (human), mAb	ALX-804-771	50 µg

#### HISTONE AND HISTONE MODIFICATIONS

Product Name	Product #	Size
Histone H2AX (pSer139), pAb	ADI-905-771	100 µg
Histone H3 (acetyl-Lys9), pAb	ADI-905-705	100 µg
Histone H3 (dimethyl-Lys9), pAb	ADI-905-778	100 µg
Histone H3 (K9 trimethylated), mAb (6F12-H4)	ALX-804-673	50 µg
Histone H3 (pSer10), pAb	ADI-905-780	100 µg
Histone H3 (pSer28), pAb	ADI-KAP-CC012	50 µL
Histone H3 (pSer28), pAb	ADI-905-752	100 µg
[K20-monomethyl]Histone H4, mAb (5E10-D8)	ALX-804-674	1 mL
[K20-trimethyl]Histone H4, mAb (4H1-G3)	ALX-804-675	1 mL
[K20-trimethyl]Histone H4, mAb (6F8-D9)	ALX-804-676	1 mL



**Global Headquarters**  
**ENZO LIFE SCIENCES, INC.**

10 Executive Blvd.  
Farmingdale, NY 11735  
Ph: 800.942.0430  
Fax: 631.694.7501  
info-usa@enzolifesciences.com

**European Sales Office**  
**ENZO LIFE SCIENCES (ELS) AG**

Industriestrasse 17  
CH-4415 Lausen, Switzerland  
Ph: +41 61 926 8989  
Fax: +41 61 926 8979  
info-eu@enzolifesciences.com

**LOCAL EUROPEAN OFFICES**

**Belgium & Luxembourg**

Enzo Life Sciences BVBA  
Avenue Louise 65/Box 11  
1050 Bruxelles  
Belgium  
Ph: +32 3 466 0420  
Fax: +32 3 808 7033  
info-be@enzolifesciences.com

**France**

Enzo Life Sciences (ELS) AG  
Branch Office Lyon  
13, avenue Albert Einstein,  
F-69100 Villeurbanne, France  
Ph: +33 472 440 655  
Fax: +33 481 680 254  
info-fr@enzolifesciences.com

**Germany**

Enzo Life Sciences GmbH  
Basler Strasse 57a  
DE-79540 Lörrach  
Germany  
Ph: +49 7621 5500 526  
Fax: +49 7621 5500 527  
info-de@enzolifesciences.com

**Netherlands**

Enzo Life Sciences BVBA  
Postbus 47  
NL-4940 AA Raamsdonksveer  
Netherlands  
Ph: +32 3 466 0420  
Fax: +32 3 808 7033  
info-nl@enzolifesciences.com

**UK & Ireland**

Enzo Life Sciences (UK) Ltd.  
1 Colleton Crescent  
Exeter EX2 4DG  
Ph: 0845 601 1488 (UK customers)  
Ph: +44 1392 825900  
Fax: +44 1392 825910  
info-uk@enzolifesciences.com

**For local distributors and detailed product information visit us online:**  
**[www.enzolifesciences.com](http://www.enzolifesciences.com)**