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**Progranulin**

Progranulin (PGRN; granulin (precursor); GRN, epithelin precursor; proepithelin (PEPI); PC cell-derived growth factor (PCDF); acrogranin; paragranulin) is a cysteine-rich protein with a molecular weight of 68.5kDa (593aa) which is typically secreted in a highly glycosylated form (88kDa). Through proteolytic cleavage by extracellular proteases a family of active peptides (granulins A to G and paragranulin) is formed, although the precursor is biologically active itself. Progranulin has been shown to be a widely expressed pluripotent growth factor which is implicated in many processes such as tumorigenesis, wound repair, and inflammation. Recent interest in progranulin is focusing on its function in the central nervous system. Mutations in the progranulin gene, located on chromosome 17, were identified to be the agent of frontotemporal lobar degeneration (FTLD), a common cause of dementia.

Several studies detected decreased progranulin levels in serum, plasma, and CSF of carriers of a mutation in the progranulin gene (PGRN). Therefore concentration levels of this protein can be considered to be a marker for detecting a PGRN mutation. Further concentrations of serum progranulin were associated to visceral obesity, elevated plasma glucose, and dyslipidemia. Progranulin might evolve as a novel marker for chronic inflammation in obesity and type-II diabetes.

**HIGHLIGHT**

- **Progranulin (human) ELISA Kit**
  - AG-P0731EK-KI01 96 wells
  - AG-P0731TP-KI01 2 x 96 wells
  - AG-P0731PP-KI01 5 x 96 wells
  For the quantitative determination of progranulin in human serum, plasma or cell culture supernatant. SENSITIVITY: 32pg/ml (range 0 to 8ng/ml).
  
  - **Progranulin (mouse) ELISA Kit**
  - AG-P0731EK-KI01 96 wells
  - AG-P0731TP-KI01 2 x 96 wells
  - AG-P0731PP-KI01 5 x 96 wells
  For the quantitative determination of progranulin in mouse serum or cell culture supernatants. SENSITIVITY: 60pg/ml (range 0 to 16ng/ml).

- **Mab to Progranulin (human)** (PG359-7)
  - ALX-804-737-C100 100 µg
  - CLONE: PG359-7. ISOTYPE: Mouse IgG1. IMMUNOGEN: Recombinant human progranulin. SPECIFICITY: Recognizes human progranulin. Detects a band of ~90kDa by Western blot. APPLICATION: ELISA, IHC (PS), IP, WB.

- **Mab to Progranulin (mouse)** (PG319-1)
  - ALX-804-760-C050 50 µg
  - ALX-804-760-C100 100 µg
  - CLONE: PG319-1. ISOTYPE: Rat IgG2. IMMUNOGEN: Recombinant mouse progranulin. SPECIFICITY: Recognizes mouse progranulin. APPLICATION: ELISA, WB.

**Granulin C**

- **PAb to Granulin C (human)**
  - ALX-210-494-C100 100 µg
  From rabbit. IMMUNOGEN: Recombinant human granulin C. SPECIFICITY: Recognizes human granulin C and human progranulin. APPLICATION: ELISA, WB.

- **Granulin C (human) (rec.) (His)**
  - ALX-201-438-C010 10 µg
  - ALX-201-438-C050 50 µg
  Produced in E. coli. The mature peptide of human granulin C (aa 364-430) is fused at the C-terminus to a His-tag.

*Lit:
- Recent insights into the molecular genetics of dementia: R. Rademakers & A. Rovelet-Lecrux; TINS
- The molecular genetics and neuropathology of frontotemporal lobar degeneration: recent developments: I.R. Mackenzie & R. Rademakers; Neurogenetics
- Mutations in progranulin (GRN) within the spectrum of clinical and pathological phenotypes of frontotemporal dementia: J.C. van Swieten & P. Heutink; Lancet Neurol. 7, 965 (2008)
- Recent developments in frontotemporal lobar degeneration: M. Cruts & C. Van Broeckhoven; Trends Genet.
Deubiquitylating Enzyme Probes

The ubiquitin cascade in its many forms includes a large family of cysteine proteases known as deubiquitylating enzymes (DUBs).

Hemagglutinin (HA)-tagged ubiquitin molecules derivatized at the C-terminus with thiol-reactive functional groups can be used as potent, irreversible inhibitors of DUBs through their covalent modification of the active site and, consequently, can act as specific probes for enzymes with DUB activity [1]. The nature of the C-terminal derivative, for example vinyl sulfone (-VS), vinyl methylester (-VME), 2-bromoethyl (-Br) or 2-chloroethyl (-Cl), has been demonstrated to determine the subset of DUB enzymes detected [2, 3, 4]. The addition of an HA-tag facilitates sensitive identification or purification of probe-modified DUBs through recognition by HA-reactive antibodies in free or agarose immobilized form.

Proteasome ELISA Kit

Proteasomes are non-lysosomal proteolytic complexes localised primarily in the cytoplasm and in the nucleus of eukaryotic cells [1]. In patients suffering from auto-immune diseases, malignant myelo-proliferative syndromes, multiple myeloma, acute and chronic lymphatic leukemia, solid tumor, sepsis or trauma, the concentration of circulating proteasome has been found to be elevated, to correlate with the disease state, and may have prognostic significance [1].

Proteasome levels have been measured successfully by enzyme-linked immunosorbent assay (ELISA) techniques in cell lysates, serum or plasma samples [2, 3]. This approach has been used to show that proteasome concentrations in peripheral blood are elevated in patients with certain types of malignant diseases, including multiple myeloma, suggesting that circulating proteasome levels may be correlated with tumor burden. The link between elevated circulating proteasome levels and disease activity has also been demonstrated in patients with systemic autoimmune diseases [4].

This kit provides the means to quantify proteasome concentrations in biological samples using a sandwich ELISA technique, utilizing two proteasome subunit specific antibodies for capture and detection purposes, together with a highly sensitive substrate. Sample proteasome levels are determined by comparison to a 20S proteasome calibration curve produced in parallel. This kit provides sufficient material for a single 96 well plate.

Deubiquitylating Enzyme Probes

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PROPOSED USES:

1. Determination of proteasome levels in biological samples (cell lysates, tissue extracts, plasma, serum).
2. Comparison of proteasome levels in plasma/serum samples associated with a particular disease/illness with samples from healthy controls.
3. Investigation of variation in proteasome levels in abnormal cell lines/tissues.

Suggested uses:

1. Determination of proteasome levels in biological samples (cell lysates, tissue extracts, plasma, serum).
2. Comparison of proteasome levels in plasma/serum samples associated with a particular disease/illness with samples from healthy controls.
3. Investigation of variation in proteasome levels in abnormal cell lines/tissues.

Suggested uses:  
1. Active site-directed probes for detection of DUBs.  
2. Isolation and identification of DUBs.  
3. Identification of DUBs within biological samples.

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**Epigenetics & Cancer**

**New Lysine-specific Histone Demethylase [LSD1] Drug Discovery Kit**

LSD1 (KDM1; lysine-specific histone demethylase 1; AOF2), a flavin-containing amine oxidase homolog and component of various corepressor complexes, catalyzes the oxidative demethylation of mono- and dimethylated lysines in histones, p53 and DNMT1. There is increasing evidence of LSD1’s importance in epigenetic and transcriptional regulation and of its roles in processes ranging from embryogenesis to carcinogenesis making LSD1 a promising target for drug discovery.

**LSD1 Fluorimetric Drug Discovery Kit**

BML-AK544-0001 1 Kit
Includes recombinant LSD1, Histone H3 Dimethyl Lysine-4 Peptide Substrate, CELLestial™ Red Substrate detection system and everything needed to complete the assay.

- Sensitive measurement of LSD1 demethylase activity using the Histone H3 Dimethyl Lysine-4 Peptide
- CELLestial™ Red Substrate detection system allows real-time fluorometric or colorimetric detection
- Single-step, homogenous assay ideal for HTS applications
- >1000U of LDS1 supplied with each kit

**Aurora Kinase**

Aurora kinases control chromatid segregation and their expression is elevated in many human cancers making them targets of interest for anti-cancer therapeutics. Phosphorylation of serine 10 of histone H3 by aurora kinase B generates the double histone H3 modification tri-methylated K9/phosphorylated S10 (H3K9me3/S10ph), important for chromosome condensation during mitosis and epigenetic silencing of genes during differentiation.

**Aurora Kinase A (human) (rec.)**

BML-SE406-0010 10 µg
Human recombinant aurora kinase A (aa 2-403) fused at the N-terminus to a His-tag.

**ZM-447439**

BML-EI373-0001 1 mg
BML-EI373-0010 10 mg
A substituted quinazoline derivative that inhibits aurora A, B, and C (IC\textsubscript{50}=1000, 50 and 250nM respectively).

**Aurora Kinase B (human) (rec.)**

BML-SE358-0010 10 µg
Full-length human recombinant aurora kinase B fused at the N-terminus to a GST-tag.

**Latest Insight**

Recently, H. Li. et al. described a novel mechanism through which necrotic cells generate proinflammatory molecules that contribute to the sterile inflammatory response. They reported that 7BIO (7-bromoindirubin-3’-oxime), a potent inducer of caspase-independent necrosis, activates the inflammasome and triggers the release of the proinflammatory cytokines IL-1β and IL-18.

**7BIO**

ALX-430-149-M005 5 mg
ALX-430-149-M025 25 mg
Induces a rapid caspase-independent cell death process distinct from apoptosis. Demonstrated selective inhibition of aurora kinase B (IC\textsubscript{50}=4.6µM) and aurora kinase C (IC\textsubscript{50}=0.7µM) whereas the homologous aurora kinase A is poorly inhibited.

**Lit:**


**ZM-447439**


Histones

Histones are the major protein constituents of chromatin in the eukaryotic nucleus. These proteins undergo different post-translational modifications, including phosphorylation, acetylation, and methylation, which have profound effects on the chromatin remodeling. Histone modifications act in diverse biological processes such as transcription, replication, DNA repair, and apoptosis.

**Histone H3 Peptide**

Ac-Gln-Thr-Ala-Arg-Lys-Ser-Thr-Gly-Lys-Ala-Pro-Arg-Lys-Gln-Leu-Ala-Thr-Lys-NH₂

BML-P271-0500 0.5 mg

Comprising residues 5-23 of the human histone H3 N-terminal tail, this peptide is centered on Lys¹⁴, preferred acetylation site for the GCN5/pCAF family of histone acetyltransferases (HATs). May be used as a substrate for assay of pCAF and hGCN5 HATs.

**Histone H3 Dimethyl Lysine-4 Peptide**

H-Ala-Arg-Thr-Lys(Me₂) Gln-Thr-Ala-Arg-Lys-Ser-Thr-Gly-Gly-Lys-Ala-Pro-Arg-Lys-Gln-Leu-Ala- NH₂

BML-P256-0500 0.5 mg

Residues 1-21 from the N-terminal tail of human histone H3, dimethylated on the side-chain (ε-amino function) of Lys⁴. Useful as a substrate for histone lysine demethylases, for example LSD1.

**MAb to Histone H3 (K9 trimethylated) (6F12-H4)**

ALX-804-673-C050 50 µg


**MAb to Histone H4 (K20 monomethylated) (5E10-D8)**

ALX-804-674-L001 1 ml


**MAb to Histone H4 (K20 trimethylated) (4H1-G3)**

ALX-804-675-L001 1 ml


**MAb to Histone H4 (K20 trimethylated) (6F8-D9)**

ALX-804-676-L001 1 ml


Sirtuins

Sirtuins (SIRT 1-7) or class III histone deacetylases (HDACs), are NAD⁺-dependent protein deacetylases/ADP ribosyltransferases that target a wide range of cellular proteins in the nucleus, cytoplasm, and mitochondria for posttranslational modifications. Sirtuins are involved in important biological processes ranging from apoptosis, cancer prevention, DNA damage repair, and stress resistance to regulation of energy expenditure and aging.

<table>
<thead>
<tr>
<th>Product</th>
<th>Prod. No.</th>
<th>Size</th>
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<tbody>
<tr>
<td>SIRT1 (human) (rec.) (His)</td>
<td>BML-SE239-0100</td>
<td>100 U</td>
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<tr>
<td>SIRT2 (human) (rec.) (His)</td>
<td>BML-SE251-0500</td>
<td>500 U</td>
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<tr>
<td>SIRT3 (human) (rec.) (His)</td>
<td>BML-SE270-0500</td>
<td>500 U</td>
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<tr>
<td>SIRT5 (human) (rec.) (His)</td>
<td>BML-SE555-0500</td>
<td>500 µg</td>
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<tr>
<td>SIRT6 (human) (rec.) (His)</td>
<td>ALX-201-449-C010</td>
<td>10 µg</td>
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<td></td>
<td>ALX-201-449-C050</td>
<td>50 µg</td>
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</tbody>
</table>

FIGURE: Immunocytochemistry of irradiated mouse embryonic fibroblasts (MEFs) stained with DAPI and MAb to Histone H3 (K9 methylated) (6F12-H4) (Prod. No. ALX-804-673). Figure courtesy of Susanne Opravil and Thomas Jenuwein, Institute of Molecular Pathology (IMP) Vienna, Austria.
Small Molecules for Stem Cell Research

The proliferation, differentiation and survival of stem cells are regulated by both intrinsic and extrinsic influences dependent on signal transduction pathways. Small molecules - enzyme inhibitors and receptor agonists & antagonists - are powerful tools for the manipulation and dissection of stem cell biology. Multiple pathways and kinases have been identified to play a role in stem cell self-renewal leading to the use of small molecules for deriving, maintaining and expanding stem cell populations. Similarly, many molecules have been identified which can induce the differentiation of stem cells into various cell types.

**Self Renewal**

PD 98,059
ALX-385-023-M001 1 mg
ALX-385-023-M005 5 mg
ALX-385-023-M010 10 mg
ALX-385-023-M100 100 mg
A MEK inhibitor that enhances self-renewal of embryonic stem cells.


6BIO
ALX-430-156-M001 1 mg
Potent, reversible and ATP-competitive inhibitor of glycogen synthase kinase-3α/β (GSK-3α/β). Promotes survival and self-renewal of human and mouse embryonic stem cells.


SB-203580
BML-E286-0001 1 mg
BML-E286-0005 5 mg
A p38 inhibitor useful for deriving and maintaining embryonic stem cells. Increases growth-factor-induced DNA synthesis and mitosis of adult cardiomyocytes consistent with dedifferentiation of these mature cells.


**Survival**

Y-27632 . 2HCl
ALX-270-333-M001 1 mg
ALX-270-333-M005 5 mg
ALX-270-333-M025 25 mg
Highly potent, cell permeable, selective and ATP competitive inhibitor of ROCK1 and ROCK2 (IC₅₀=800nM). Enhances survival and cloning efficiency of human embryonic stem cells.


BIX 01294
ALX-270-473-M002 2 mg


(±)-BAY K 8644
ALX-550-213-M005 5 mg
ALX-550-213-M025 25 mg
Potent, direct acting, voltage-sensitive Ca²⁺ channel (L-type) agonist. Enables reprogramming of Oct4/Klf4-transduced mouse embryonic fibroblasts.


Valproic acid . Na
ALX-550-304-G005 5 g
Enhances iPS formation in mouse embryonic fibroblasts in the absence of exogenous c-Myc, which may be tumorigenic. Inhibits histone deacetylase 1 (HDAC1) (IC₅₀=0.4mM). Inhibitor of human cytochrome P450 2C9 2C9 isofrom (Kᵢ=600µM). Inducer of apoptosis in human leukemia cells.


**Cardiac Stem Cells**

Trichostatin A [TSA]
BML-GR309-0001 1 mg
BML-GR309-0005 5 mg
A class I & II HDAC inhibitor. Induces increased acetylation of GATA4, a cardiac-specific transcription factor, and increased cardiac muscle differentiation.


BML-275
(Dorsomorphin; Compound C)
BML-EI369-0005 5 mg
BML-EI369-0025 25 mg
A selective small molecule inhibitor of BMP signaling. Promotes cardiomyogenesis in embryonic stem cells.


incorporating
**Neuronal & Hematopoietic Stem Cells**

**Retinoic acid, all trans**
- BML-GR100-0500 500 mg
- BML-GR100-5000 5 g

Active metabolite of vitamin A. Extensively used in neuronal differentiation protocols.

**Lysophosphatidic acid (LPA)**
- BML-LP100-0005 5 mg
- BML-LP100-0025 25 mg

Induces clonal generation of mouse neurospheres via proliferation of neuronal progenitors positive for sca-1 and AC133, markers of hematopoietic and neural stem cells.

**DAPT**
- ALX-270-416-M005 5 mg
- ALX-270-416-M025 25 mg

A γ-secretase inhibitor, which antagonizes Notch signaling through inhibition of Notch processing. DAPT-treatment can influence hematopoietic cell fate decisions and enhances neuronal differentiation in embryonic stem cell-derived embryoid bodies independent of sonic hedgehog (shh) signaling.

**Purmorphamine**
- ALX-420-045-M001 1 mg
- ALX-420-045-M005 5 mg
- ALX-420-045-M025 25 mg

Agonist of smoothened by activation of the Hedgehog (Hh) pathway. Promotes the differentiation of human and murine mesenchymal progenitor cells into osteoblasts.

**Dexamethasone**
- BML-EI126-0001 1 g
- BML-EI126-0005 5 g

Anti-inflammatory glucocorticoid. Modulates osteogenesis of mesenchymal stem cells.

**Ciglitazone**
- BML-GR205-0005 5 mg
- BML-GR205-0025 25 mg

Thiazolidinediones stimulate adipogenesis and decrease osteoblastogenesis in human mesenchymal stem cells.

---

**Pancreatic Stem Cells**

**Cyclopamine**
- BML-GR334-0001 1 mg
- BML-GR334-0005 5 mg

An alkaloid sonic hedgehog pathway inhibitor. Cyclopamine induces expression of pdx-1, a transcription factor essential for pancreas development, β-cell differentiation and insulin secretion, and stimulates insulin secretion in differentiation protocols of mouse embryonic stem cells.

**Ly 294002**
- BML-ST420-0005 5 mg
- BML-ST420-0025 25 mg

Pi-3 kinase inhibition favors differentiation versus proliferation in embryonic stem cells. Pi-3 kinase inhibitors have also been used in conjunction with nicotinamide to mature mouse embryonic stem cell-derived insulin-producing cells.

---

**Mesenchymal Stem Cells**

**Purmorphamine**
- ALX-420-045-M001 1 mg
- ALX-420-045-M005 5 mg
- ALX-420-045-M025 25 mg

Agonist of smoothened by activation of the Hedgehog (Hh) pathway. Promotes the differentiation of human and murine mesenchymal progenitor cells into osteoblasts.

**Dexamethasone**
- BML-EI126-0001 1 g
- BML-EI126-0005 5 g

Anti-inflammatory glucocorticoid. Modulates osteogenesis of mesenchymal stem cells.

**Ciglitazone**
- BML-GR205-0005 5 mg
- BML-GR205-0025 25 mg

Thiazolidinediones stimulate adipogenesis and decrease osteoblastogenesis in human mesenchymal stem cells.
Biologically Active Small Molecules

**Photoactivable Retinoic Acid**

**Caged Retinoic Acid**

ALX-460-037-MC05 0.5 mg

Synthetic. Photoactivatable form of retinoic acid.


**Terpenoid With Potent Anti-Tumor Activity**

**Oridonin**

[Rubescessin A]

ALX-350-390-M010 10 mg
ALX-350-390-M050 50 mg
ALX-350-390-M250 250 mg

Isolated from *Rabdosa rubescens*. Diterpene with potent anti-tumor activity. Induces apoptosis and autophagy.


**A Radical Scavenger**

**Orsellinic acid**

ALX-350-391-M001 1 mg

Isolated from fungus *Chaetomium* sp. Blocks PAF-mediated neuronal apoptosis. Shows free radical scavenging activity.


**Microcystins**

**Microcystin-WR**

ALX-350-167-C025 25 µg
ALX-350-167-C100 100 µg

Isolated from *Microcystis aeruginosa*.

**Microcystin-RR (desmethylated)**

ALX-350-168-C025 25 µg
ALX-350-168-C100 100 µg

Isolated from *Microcystis aeruginosa*.

**Receptor Tyrosine Kinase**

**Tie-2 (human) (rec.)**

[BKD]

BML-SE437-0010 10 µg

Produced in insect cells. Active Tie-2 (aa 771- end).

**Tie-2 Inhibitor 7**

ALX-270-495-M001 1 mg

Cell permeable Tie-2 inhibitor (IC_{50}=1µM).

**Tie-2 Inhibitor 13**

ALX-270-434-M001 1 mg

Potent and cell permeable Tie-2 inhibitor (IC_{50}=600nm).

**A New Mouse/Rat KAT II Inhibitor**

**(S)-ESBA . HCl**

[(S)-(4-Ethylsulfonyl)benzoylalanine . HCl]

ALX-550-529-M001 1 mg
ALX-550-529-M005 5 mg
ALX-550-529-M010 10 mg

Potent and selective mouse/rat kynurenine aminotransferase II (KAT II) inhibitor.


For a comprehensive bibliography please visit our website.

**NEW**

MICROCYSTINS

**Microcystin-WR**

ALX-350-167-C025 25 µg
ALX-350-167-C100 100 µg

Isolated from *Microcystis aeruginosa*.

**Microcystin-RR (desmethylated)**

ALX-350-168-C025 25 µg
ALX-350-168-C100 100 µg

Isolated from *Microcystis aeruginosa*.

Caged Retinoic Acid

Oridonin

(S)-ESBA . HCl

Tie-2 Inhibitor 7

Microcystin-WR

Orsellinic acid

Microcystin-RR (desmethylated)

Tie-2 Inhibitor 13

incorporating

www.enzolifesciences.com
**Latest Additions**

**SDMA (human) ELISA Kit**

ALX-850-331-K101

For the quantitative determination of asymmetric dimethylarginine (SDMA) in human EDTA-plasma and serum. Does not cross-react with ADMA, NMMA or L-arginine. QUANTITY: 96 wells (~80 tests). SENSITIVITY: 0.05µmol/l (range 0.1 to 2µmol/l), expected value: 0.47µmol/l ± 0.14µmol/l.

**Dimethylargininase-1**

Dimethylargininase (DDAH) is a Cys-hydrolase, which, through catabolism of mono- and dimethylated derivatives of L-arginine, regulates the activity of nitric oxide synthase (NOS). DDAH-1 is mainly present in tissues expressing the constitutive forms of nitric oxide synthase such as brain and kidney.

**PAb to Dimethylargininase-1**

ALX-215-066-R100 100 µl

From rabbit. IMMUNOGEN: Full lenght bovine dimethylargininase 1 (DDAH-1). SPECIFICITY: Recognizes human, mouse, bovine and porcine DDAH-1. Detects a band of ~35kDa by Western blot. Does not cross-react with DDAH-2. APPLICATION: WB.

**DLL1**

DLL1 is a human homolog of the Notch Delta ligand and is a member of the delta/serrate/jagged family. It plays a role in mediating cell fate decisions during hematopoiesis.

**MAb to DLL1 (human) (D1L165-6)**

ALX-804-758-C050 50 µg

ALX-804-758-C100 100 µg

CLONE: D1L165-6. ISOTYPE: Mouse IgG1. IMMUNOGEN: Recombinant human DLL1. SPECIFICITY: Recognizes human DLL1. APPLICATION: ELISA, WB.

**DLL1, Soluble (human) ELISA Kit**

AG-45A-0027EK-K101 96 wells

AG-45A-0027TP-K101 2 x 96 wells

AG-45A-0027PFP-K101 5 x 96 wells

For the quantitative determination of soluble DLL1 in human serum, plasma or cell culture supernatant. SENSITIVITY: 120pg/ml (range 0 to 16ng/ml).

**VMP1 [Vacuole Membrane Protein 1]**

VMP1 is a transmembrane protein that co-localizes with LC3, a marker of the autophagosomes. It interacts with beclin-1, a mammalian autophagy initiator, through the VMP1-Atg domain, which is essential for autophagosome formation. VMP1 endogenous expression co-localizes with LC3 in pancreas tissue undergoing pancreatitis-induced autophagy.

**PAb to Vacuole Membrane Protein 1**

ALX-215-068-C200 200 µg

From rabbit. IMMUNOGEN: Synthetic peptide corresponding to aa 386-406 of human vacuole membrane protein 1 (VMP1). SPECIFICITY: Recognizes human, mouse and rat VMP1. APPLICATION: IHC (PS), IP, WB.

**c-IAP1**

c-IAP1 is one of eight identified human inhibitor of apoptosis proteins (IAPs) and is known to inhibit specific caspases.

**MAb to c-IAP1 (1E1-1-10)**

ALX-803-335-C100 100 µg

CLONE: 1E1-10. ISOTYPE: Rat IgG2. IMMUNOGEN: Synthetic peptide corresponding to aa 221-232 of mouse c-IAP1. SPECIFICITY: Recognizes human and mouse c-IAP1. Detects a band of ~62kD by Western blot. APPLICATION: WB.

**Meteorin**

Meteorin is a protein of 31 kDa secreted by perivascular astrocytes, neural and glia progenitors. It is a potent neurotrophic growth factor that induces axonal outgrowth and plays important roles in glial cell differentiation. Meteorin expressed in the astrocytes surrounding blood vessels attenuates angiogenesis and promotes vascular maturation.

**PAb to Meteorin (human) (AT142)**

ALX-210-968-C100 100 µg

From rabbit. IMMUNOGEN: Recombinant human meteorin (aa 24-293). SPECIFICITY: Recognizes human meteorin. APPLICATION: WB.

**FIGURE**

Typical standard curve for DLL1, Soluble (human) ELISA Kit
AMPK – A Key Energy Regulator

The AMP-activated protein kinase (AMPK) system acts as a sensor of cellular energy status that is conserved in all eukaryotic cells. AMPK comprises three subunits; the alpha subunit is catalytic, the beta subunit contains a glycogen-sensing domain, and the gamma contains two regulatory sites that bind the activating and inhibitory nucleotides AMP and ATP. Hormones and cytokines such as insulin, leptin, and adiponectin interact with the system, and it appears to play a key role in maintaining energy balance at the whole body level. The AMPK system is the target for the antidiabetic drug metformin.

**AMPK Inhibitor**

<table>
<thead>
<tr>
<th>Product</th>
<th>Activity</th>
<th>Prod. No.</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>BML-275</td>
<td>A cell permeable pyrazolopyrimidine derivative that inhibits AMP Kinase (K_\text{d}=109nM in the absence of AMP) in an ATP-competitive manner. It displays no significant inhibition of ZAPK, SYK, PKC, PKA and JAK3. Decreases food intake in mice and inhibits the effects of AICAR and metformin. It has recently been shown to inhibit BMP type I receptors ALK2, ALK3 and ALK6.</td>
<td>BML-EI369-0005 5 mg</td>
<td>BML-EI369-0025 25 mg</td>
</tr>
</tbody>
</table>

**AMPK Enzyme**

<table>
<thead>
<tr>
<th>Product</th>
<th>Activity</th>
<th>Prod. No.</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMPK (human) (rec.)</td>
<td>Active AMPK composed of subunits α1, β1 and γ1, full length, expressed in insect cells.</td>
<td>BML-SE491-0005 5 µg</td>
<td>BML-SE491-0020 20 µg</td>
</tr>
</tbody>
</table>

**AMPK Substrates**

<table>
<thead>
<tr>
<th>Product</th>
<th>Activity</th>
<th>Prod. No.</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAMS Peptide</td>
<td>HMRSAMSGLHLVKRR; derived from rat acetyl-CoA carboxylase (K_m=33.3µM).</td>
<td>BML-P231-0001</td>
<td>1 mg</td>
</tr>
<tr>
<td>Biotinylated SAMS Peptide</td>
<td>Same as BML-P231 (above) but biotinylated at its amino terminus.</td>
<td>BML-P232-0001</td>
<td>1 mg</td>
</tr>
<tr>
<td>Biotinylated SAMS Peptide, Phosphorylated</td>
<td>Same as BML-P232 (above) but phosphorylated at Ser7. A useful control peptide for BML-P231 and BML-P232.</td>
<td>BML-P233-0001</td>
<td>1 mg</td>
</tr>
<tr>
<td>AMARA Peptide Substrate</td>
<td>AMARAASAAALARRR; synthetic AMPK substrate.</td>
<td>BML-P270-0001</td>
<td>1 mg</td>
</tr>
</tbody>
</table>

**Latest Insight**

AMPK is strongly stimulated by exercise and plays a central role in sensing energy status. A recent study found that treatment of sedentary mice with AICAR mimicked many of the positive effects of exercise. Four weeks of AICAR treatment induced metabolic genes, decreased fat mass, increased oxygen consumption and enhanced running endurance by 44%. This study not only helps to characterize the molecular pathways that lead to the beneficial effects of exercise, but also suggests that exercise mimetic drugs may have therapeutic potential in treating muscle diseases like wasting and frailty or more broadly for treatment of obesity or heart disease where exercise has positive benefits.

**AICAR**

[5-Aminoimidazole-4-carboxamide 1-ß-D-ribofuranoside]

BML-EI330-0050 50 mg
BML-EI330-0250 250 mg

Activates AMP Kinase in whole cells. Mimics the effects of insulin on the expression of two gluconeogenic genes PEPCK and glucose-6-phosphatase. Inhibits PPAR_\alpha coactivation and adipocyte differentiation. Substrate for the AICAR transformylase activity of ATIC.

DPPIV – An Important Target for Diabetes

Dipeptidyl peptidases (DPPs) are members of the class of proteases known as prolyl peptidases, which cleave proteins after proline residues. DPPIV (CD26) is the most well-known of the family due to its involvement in diabetes, but it and other family members play roles in apoptosis, cell migration, and bioactive peptide cleavage, and are implicated in cancer, inflammation, pain, and blood, autoimmune & neurological disorders.

DPPIV Drug Discovery Kit
BML-AK499-0001 1 Kit
Uses a convenient microplate format to screen DPPIV inhibitors colorimetrically or fluorimetrically. Included are active enzyme, substrates and standards, assay buffer, a control inhibitor (P32/98), microplates, and a detailed instruction booklet. QUANTITY: 1 kit sufficient for 96 assays.

P32/98
BML-P1142-0010 10 mg
BML-P1142-0050 50 mg
P32/98 (Ile-thiazolidide) is a specific, competitive transition-state substrate analog inhibitor of dipeptidyl peptidase IV (DPIV; DPPIV; CD26) with a Kᵢ of 130nM.

Prolyl Peptidase Enzymes & Substrates for Selectivity Screening

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Prod. No.</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enzymes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPPII/DPP7 (human) (rec.)</td>
<td>DPPII cleaves short bioactive peptides such as substance P, glucagon, and bradykinin.</td>
<td>BML-SE564-0010</td>
<td>10 µg</td>
</tr>
<tr>
<td>DPPIII (human) (rec.)</td>
<td>DPPIII cleaves biologically active peptides such as enkephalins, angiotensins, and endomorphins.</td>
<td>BML-SE529-0010</td>
<td>10 µg</td>
</tr>
<tr>
<td>DPPIV (human) (rec.)</td>
<td>Active soluble DPPIV, residues Asn²⁹-Pro⁷⁶⁶.</td>
<td>BML-SE434-0025</td>
<td>25 mU</td>
</tr>
<tr>
<td>DPP8 (human) (rec.)</td>
<td>DPP8 may have roles in cell adhesion, migration, and apoptosis.</td>
<td>BML-SE527-0010</td>
<td>10 µg</td>
</tr>
<tr>
<td>DPP9 (human) (rec.)</td>
<td>DPP9 may have roles in cell adhesion, migration, and apoptosis.</td>
<td>BML-SE528-0010</td>
<td>10 µg</td>
</tr>
<tr>
<td>FAP (human) (rec.)</td>
<td>Active soluble FAP, residues Ser²⁹-Asp⁷⁶⁰.</td>
<td>BML-SE409-0010</td>
<td>10 µg</td>
</tr>
<tr>
<td>POP/PREP (human) (rec.)</td>
<td>POP cleaves peptide hormones and neuropeptides such as oxytocin, angiotensins, and bradykinin.</td>
<td>BML-SE545-0010</td>
<td>10 µg</td>
</tr>
<tr>
<td><strong>Substrates</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GP-pNA (Chromogenic Substrate)</td>
<td>Chromogenic substrate for DPPIV, DPP7/II, DPP8, PCP, and POP.</td>
<td>BML-P188-0025</td>
<td>25 mg</td>
</tr>
<tr>
<td>GP-AMC (Fluorogenic Substrate)</td>
<td>Fluorogenic substrate for DPPIV, DPPII/VII, DPP8, DPP9, and FAP.</td>
<td>BML-P189-0005</td>
<td>5 mg</td>
</tr>
<tr>
<td>VP-AMC (Fluorogenic Substrate)</td>
<td>Fluorogenic substrate cleaved by DPPIV, DPP8, and FAP.</td>
<td>BML-P448-0005</td>
<td>5 mg</td>
</tr>
<tr>
<td>DP-AMC (Fluorogenic Substrate)</td>
<td>Fluorogenic substrate cleaved by DPPIV, DPPII/VII, and likely DPP8.</td>
<td>BML-P449-0005</td>
<td>5 mg</td>
</tr>
<tr>
<td>WP-AMC (Fluorogenic Substrate)</td>
<td>Fluorogenic substrate likely cleaved by DPPIV and DPP8.</td>
<td>BML-P450-0005</td>
<td>5 mg</td>
</tr>
</tbody>
</table>
FluoForte™ Calcium Assay Kit

**Brilliant Results for Calcium Assay Discovery**

Utilizing the brightest and most sensitive fluorescent Ca\(^{2+}\) indicator, the FluoForte™ Calcium Assay kit provides much higher signal intensity and the largest assay window on the market. This homogeneous fluorescence-based assay kit detects calcium mobilization across a broad spectrum of biological targets. The easy-to-use protocol does not require a wash step or exogenous addition of a quencher dye, which could adversely affect receptor-ligand interaction kinetics. FluoForte™ provides comparable EC\(_{50}\) values and is visibly brighter than Fluo-4 Direct™ and Calcium 4, allowing measurements of challenging cell lines and receptors.

The assay can be performed in a convenient 96-well or 384-well microplate format and easily adapts to automation with dye loading at room temperature.

![FluoForte™ - AM vs Fluo-4 AM](image)

**FIGURE 1:** Hela cells were seeded overnight at 40,000 cells per 100µl per well in a 96-well black wall/clear bottom Costar® plate. The growth medium was removed, and the cells were incubated with 100µl of 4µM Fluo-4 AM or FluoForte™ AM in HHBS at 37 °C, 5% CO\(_2\) incubator for 1 hour. The cells were washed twice with 200µl HHBS, ATP (20µl/well) was added to achieve concentrations of 100nM with dye efflux inhibitor, then immediately imaged with a fluorescence microscope (Carl Zeiss, Inc.) using FITC channel.

<table>
<thead>
<tr>
<th>Product</th>
<th>Prod. No.</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>FluoForte™ Calcium Assay Kit (starter pack)</td>
<td>ENZ-51017</td>
<td>10 x 96-well plates</td>
</tr>
<tr>
<td>FluoForte™ Calcium Assay Kit (high-throughput)</td>
<td>ENZ-51016</td>
<td>100 x 96-well plates</td>
</tr>
<tr>
<td>FluoForte™ Reagent</td>
<td>ENZ-52014</td>
<td>5 x 50 µg</td>
</tr>
<tr>
<td>FluoForte™ Reagent</td>
<td>ENZ-52015</td>
<td>1 mg</td>
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</table>

**Just Released**

<table>
<thead>
<tr>
<th>Product</th>
<th>Prod. No.</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>GFP-Certified™ FluoForte™ Calcium Assay Kit for microplates</td>
<td>ENZ-51020-KP010</td>
<td>1 Kit</td>
</tr>
<tr>
<td>GFP-Certified™ FluoForte™ Calcium Assay Kit for microplates</td>
<td>ENZ-51020-KP100</td>
<td>10 x 1 Kit</td>
</tr>
<tr>
<td>GFP-Certified™ FluoForte™ Reagent</td>
<td>ENZ-52016-SC50</td>
<td>5 x 50 µg</td>
</tr>
<tr>
<td>GFP-Certified™ FluoForte™ Reagent</td>
<td>ENZ-52016-M001</td>
<td>1 mg</td>
</tr>
</tbody>
</table>