New products

VOLUME 1 | 2013

ANTIBODIES, ASSAYS, SMALL MOLECULES, INHIBITORS, AND PROTEINS

Signaling | Cancer | Epigenetics & Gene Regulation | Cell Structure | Stem Cell | Neuroscience

Merck Millipore—with the expertise of Calbiochem®, Chemicon®, and Upstate®

Cancer Biomarkers

Cancer biomarkers are proteins and other biological molecules that are abnormally expressed in cells, tissues, blood, and other body fluids as a sign of the presence or progression of various cancers. Over the years, however, cancer biomarkers have become more than just disease signals used for detection and screening. They have also become targets for research, drug development and disease treatment. As such, cancer biomarker research and discovery has become one of the fastest growing areas of cancer research.

Merck Millipore provides a suite of well-published antibodies, inhibitors and assays to help researchers detect cancer biomarkers at both the cellular and tissue levels.

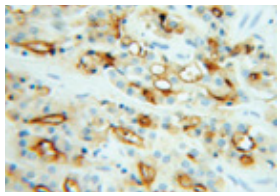
FEATURED BIOMARKER ANTIBODIES:

Anti-FOLH1 (Prostate-specific Membrane Antigen)

Catalogue No. ABC279

Folate hydrolase1 (FOLH1), also known as Prostate-specific Membrane Antigen (PSMA) or membrane glutamate carboxypeptidase (mGCP), is upregulated in prostate cancer, showing an 8-12 fold greater expression than in normal prostate. In addition to being a prostate cancer biomarker, FOLH1 may also be a possible marker for neurological disorders such as schizophrenia, Alzheimer's disease and Huntington disease.

Merck Millipore's newly released Anti-FOLH1 (Prostate-specific Membrane Antigen) polyclonal antibody that detects FOLH1 in human tissues and cells via Western blot and immunohistochemistry analysis with high specificity.



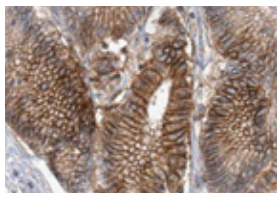
Immunohistochemistry Analysis: FOLH1 positive staining was observed in formalin-fixed paraffin embedded (FFPE) human prostate cancer tissue was using Anti-FOLH1 (Cat. No. ABC279).

Anti-Carbonic Anhydrase 9 (CA9)

Catalogue No. ABC272

Carbonic anhydrase 9 (CA9) is a transmembrane protein that catalyzes the reversible hydration of CO_2 into bicarbonate and a proton, thereby enabling tumor cells to maintain a neutral pH. It is also an endogenous marker for hypoxia and the only known tumor-associated carbonic anhydrase isoenzyme. Its expression has been found in a variety of tumor types, including colorectal cancer.

Use our new anti-CA9 polyclonal antibody to specifically detect CA9 in human and mouse tissues and cells via Western blot and immunohistochemistry analysis.



Immunohistochemistry Analysis: Carbonic anhydrase 9 (CA9) -positive staining was observed in formalin-fixed paraffin embedded (FFPE) human colon cancer tissue, using anti-CA9 (Cat. No. ABC272).

Cancer

New Antibodies, Kits, & Proteins

PUBLICATION HIGHLIGHT ON NEW ANTIBODIES:

Merck Millipore's newly released Anti-phospho-p62/SQSTM1 (Ser403), clone 4F6 monoclonal antibody (Catalogue No. MABC186) has been published in an important study a key mechanism by which cells can utilize selective macroautophagy to degrade polyubiqutinated proteins and protein aggregates that are poorly degraded by proteasomes. In the G. Matsumoto et al. paper entitled: **"Serine 403 phosphorylation of p62/SQSTM1 regulates selective autophagic clearance of ubiquitinated proteins"***

The RIKEN Brain Science Institute researchers demonstrated that the specific phosphorylation of p62/SQSTM1 at serine 403 (S403) results in increased affinity between p62 and polyubiquitin chains, resulting in the targeting of tagged proteins in sequestomes for ultimate autophagosome degradation. The researchers used the clone 4F6 monoclonal antibody to confirm by Western and Immunohistochemistry, the S403 phosphorylation of p62 *in vivo* much more robustly than using previous polyclonals. They further revealed that p62 dependent CK2 overexpression or phosphatase inhibition reduces the formation of polyglutamine-expanded huntingtin inclusion bodies. They propose that p62 phosphorylation at S403 is a potential therapeutic target for the induction of autophagic degradation of pathogenic ubiquitinated proteins in neurodegenerative diseases.

*Molecular cell (2011) 44:279-289.

Description	Host	Species Reactivity	Key Applications	Catalogue No.
Antibodies				
Anti-Annexin A1	Rabbit	Hu, Ms, Rt, Porcine, Chimpanzee, Bov	WB, IHC	ABC151
Anti-BAG3	Rabbit	Hu, Ms	WB	ABC277
Anti-BAG3, clone AC-1	Mouse	Hu	IP, IHC (P)	MABC282
Anti-BST2	Rabbit	Hu	WB, IHC (P)	ABC149
Anti-CA9	Rabbit	Hu, Ms	WB, IHC	ABC272
Anti-Caspase3 (active form), clone 3D9.3	Mouse	Hu	WB, IC, FC	MAB10753
Anti-CDC45	Rabbit	Hu	WB, IF	ABC263
Anti-CDK6	Rabbit	Hu	WB, IHC	ABC275
Anti-CDK9	Rabbit	Hu	WB, IHC	ABC294
Anti-CHMP2B	Rabbit	Hu	WB	ABC292
Anti-CTNS	Rabbit	Hu	WB, IHC	ABC276
Anti-CTSL2	Rabbit	Hu, Ms	WB	ABC286
Anti-CXCR7	Rabbit	Hu, Rt, Horse, Primate	WB, IHC (P)	ABC150
Anti-CYP24A1	Rabbit	Hu	WB	ABC278
Anti-CYP4F12	Rabbit	Hu	WB, IHC	ABC261
Anti-EPHX2	Rabbit	Hu	WB, IHC	ABC282
Anti-EPS8	Rabbit	Ms, Rt, Hu	WB	ABC116
Anti-EXOSC10	Rabbit	Hu	WB, IHC	ABC267
Anti-FANCA	Rabbit	Hu	WB	ABC287
Anti-FOLH1	Rabbit	Hu	WB, IHC	ABC279
Anti-GPX4	Rabbit	Hu, Ms	WB	ABC269
Anti-GSTM5	Rabbit	Hu	WB, IHC, IF	ABC260
Anti-HBP1	Rabbit	Hu	WB, IHC	ABC295
Anti-Isocitrate dehydrogenase (IDH1), clone W09	Rat	Hu	WB, IHC	MABC170
Anti-Isocitrate Dehydrogenase 1 (IDH1), clone RMab-3	Mouse	Hu	WB	MABC197
Anti-KLF6	Rabbit	Hu	WB	ABC265
Anti-LGALS9	Rabbit	Hu	WB	ABC262
Anti-MCM7	Rabbit	Hu, Rt, Rhesus Macaque, Chimpanzee	WB	ABC157
Anti-NOX4	Rabbit	Hu, Ms	WB, IHC	ABC271
Anti-NPC2	Rabbit	Hu	WB	ABC289
Anti-phospho-p62/SQSTM1 (Ser403), clone 4F6	Rat	Hu	WB, IHC	MABC186
Anti-phospho-ZEB2 (Ser784)	Rabbit	Ms	WB, Peptide Inhibition Assay	ABC70
Anti-PRCC	Rabbit	Hu	WB	ABC293
Anti-PRDX5	Rabbit	Hu, Ms	WB, IHC, IF	ABC281
Anti-QSOX1	Rabbit	Hu	WB, IHC, IC	ABC274
Anti-RIOK3	Rabbit	Hu, Ms	WB, IHC	ABC280
Anti-SH2D3A	Rabbit	Hu	WB	ABC270
Anti-SIGMAR1	Rabbit	Hu, Ms	WB, IHC	ABC288
Anti-SLC22A18	Rabbit	Hu, Ms, Rt	WB, IHC	ABC273
Anti-TRAF1, clone 1F3	Rat	Mky, Hu	WB, IHC, FC	MABC260
Milli-Mark™ Anti-Thymidylate Synthase-APC, clone TS106	Mouse	Hu	FC	FCMAB382APC
Kits & Assays				
LentiBrite™ RFP-p62 Lentiviral Biosensor			Transfection, IF, IC	17-10404
Proteins & Enzymes				
Flt1, active, 10 µg			Kinase Assay	14-923
Flt1, active, 250 µg			Kinase Assay	14-923M
Flt1, active, bulk			Kinase Assay	14-923-K

For published studies using this new product, visit: www.merckmillipore.com

LEGEND
Species: Hu=Human, Ms=Mouse, Rt=Rat, Bov=Bovine, Mky=Monkey
Applications: FC=FlowCytometry, IC=Immunocytochemistry, IHC=Immunohistochemistry, IHC(P)=Immunohistochemistry (Paraffin), IF=Immunofluorescence, IP=Immunoprecipitation, WB= Western Blotting

Cancer (continued)

New Small Molecules & Inhibitors

Description	Details	Catalogue No.
Bax Activator, BAM7	A cell-permeable pyrazolone compound that directly, selectively, and reversibly binds to the BH3-binding groove at the N-terminal face of Bax and triggers conformational changes leading to Bax oligomerization in a dose-dependent manner (IC_{50} = 3.3 - 4.4 µM) and promotes its translocation to mitochondria to induce apoptotic cell death.	196800-10MG
Carbonic Anhydrase IX Inhibitor III, Methazolamide	A cell-permeable thiadiazolylsulfonamide derivative that acts as a carbonic anhydrase (CA) inhibitor (K_i = 20 nM) with anti-glaucoma, anti-diabetic, and potential anti-neoplastic activity.	215902-50MG
Caspase-6 Inhibitor XII, pep419	A cell-permeable 18-mer synthetic peptide that acts as a selective, non-competitive inhibitor of caspase-6 (IC_{50} = 8.6 µM). Blocks the activity of processed caspase-6 as evidenced by its reduced ability to process VEID-AMC substrate.	218833-5MG
Glucose Transporter Inhibitor II	A cell-permeable thiazolidinedione compound that is shown to reversibly block glucose uptake in androgen-sensitive human prostate adenocarcinoma (LNCaP) cells transfected with GLUT1 (IC_{50} = 2 µM). Selectively reduces proliferation (IC_{50} = 2.0 µM) and induces apoptosis (IC_{50} = 2.5 µM) in LNCaP cells.	400035-10MG
Glucose Transporter Inhibitor IV, WZB117	A bis-hydroxybenzoate compound that acts as a fast-acting, irreversible blocker of glucose transport by GLUT1 in red blood cells. Shown to rapidly inhibit glucose transport in cancer cells (IC_{50} ~ 500 nM in A549 cells) and block proliferation.	400036-25MG
InSolution™ Akt Inhibitor X	A cell-permeable, reversible, and selective inhibitor of Akt phosphorylation and its *in vitro* kinase activity (complete inhibition < 5 µM). Shown to suppress growth of Rh (rhabdomyosarcoma) cell lines (IC_{50} = 2-5 µM), inhibit IGF-I-stimulated nuclear translocation of Akt.	124039-2MG
InSolution™ Cdk1 Inhibitor IV, RO-3306	A cell-permeable quinolinyl thiazolinone compound that acts as a potent and ATP-competitive inhibitor of Cdk1 (K_i = 35 nM and 110 nM for Cdk1/B1 and Cdk1/A, respectively). Short-term treatment for up to 20 hrs results in fully reversible G2/M cell cycle arrest, while prolonged treament (>48 hrs) results in apoptotic cell death in proliferating cancer cells.	217721-2MG
InSolution™ Nocodazole	Inhibitor of mitosis. Has highly specific antimicrotubular activity for mammalian cells in culture. Promotes tubulin depolymerization. Also acts as a high-affinity ligand for the cancer-related kinases ABL, c-KIT, BRAF, and MEK (K_d < 2 µM).	487929-10MG
InSolution™ Tetrahydrouridine	A potent competitive inhibitor of cytidine deaminase. Used in combination with cytosine arabinoside (Ara-C) to assess the anti-leukemic activity and anti-tumor activity of Ara-C in *in vitro* studies.	584223-25MG
IRE1 Inhibitor II	A cell-permeable salicylaldehyde compound that is shown to inhibit ER stress-induced Xbp1 mRNA splicing (100% inhibition by ≤25 µM in Tunicamycin-treated U373 cultures) in a reversible manner.	412511-25MG
LIM Kinase Inhibitor I, LIMKi 3	A cell-permeable pyrazolylthiazolo-isobutyramide compound that acts as a potent LIM kinase inhibitor (IC_{50} = 7 and 8 nM against LIMK1 and LIMK2, respectively) and effectively suppresses cellular cofilin phosphorylation (IC_{50} ~ 1 µM in A549 and MDA-MB-231 cultures).	435930-10MG
PERK Inhibitor I, GSK2606414	A cell-permeable pyrrolopyrimidinamine compound that acts as a highly potent inhibitor against EIF2AK3/PERK-catalyzed EIF2α Ser51 phosphorylation in kinase assays (IC_{50} = 400 pM; 30 min preincubation; [ATP] = 5 µM).	516535-5MG
PIM-Kinase Inhibitor X, CX-6258	An orally bioavailable oxindolo-furanyl compound that acts as a potent, reversible and ATP-competitive inhibitor of pan PIM-kinases (IC_{50} = 5, 25 and 16 nM for PIM-1, PIM-2 and PIM-3, respectively; K_i = 5 nM for PIM-1). Shown to arrest the proliferation of several human cancer cells.	526529-10MG

PUBLICATION HIGHLIGHT
ON SMALL MOLECULES:

Bax Activator, BAM7

((E)-4-(2-(2-Ethoxyphenyl)hydrazono)-3-methyl-1-(4-phenylthiazol-2-yl)-1H-pyrazol-5(4H)-one, HBr)

Merck Millipore has recently introduced Bax Activator, BAM7, a cell-permeable pyrazolone compound that directly, selectively, and reversibly binds to the BH3-binding groove at the N-terminal face of Bax and triggers conformational changes leading to Bax oligomerization (IC_{50} = 3.3 - 4.4 µM) and promote its translocation to mitochondria to induce apoptotic cell death.

Recently, Gavathiotis et al. from the Department of Pediatric Oncology at Dana-Farber Cancer Institute in Boston used this molecule and showed that it does not interact with the BH3-binding pocket of anti-apoptotic proteins or pro-apoptotic Bak and induces cell death in a Bax-dependent fashion. In their studies they used a competitive fluorescence polarization assay based on the interaction between recombinant Bax and the fluoresceinated stabilized α-helix of Bcl-2 domain modeled after BIM BH3. They have identified a geographically distinct BH3-binding groove, which mediates direct Bax activation. They suggest that this small molecule may lead to discovery of new generation of apoptotic modulators, which can directly activate pro-apoptotic members of the Bcl-2 family and may overcome apoptotic blocks in cancer cells.

Gavathiotis, E., Reyna DE, Bellairs, JA, Leshchiner ES, and Walensky LD. (2012). Nat. Chem. Biol. 8, 639-645.

For publications on using these small molecules, visit: www.merck4biosciences.com

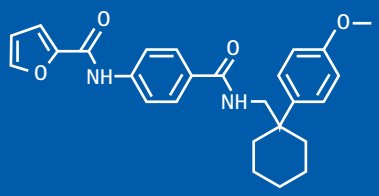
PUBLICATION HIGHLIGHT
ON SMALL MOLECULES:

Tankyrase1/2 Inhibitor IV, JW55

(N-(4-((4-(4-Methoxyphenyl)tetrahydro-2H-pyran-4-yl)methylcarbamoyl)phenyl)furan-2-carboxamide)

Merck Millipore is pleased to introduce a new cell-permeable potent, selective, and reversible inhibitor of poly(ADP-ribosyl)ation activity of tankyrase 1 and 2 (IC_{50} = 1.9 µM and 830 nM, respectively). This compound exhibits high selectivity over PARP1 (IC_{50} = 20 µM). It induces cell cycle arrest, diminishes the proliferation of SW480 colorectal cancer cells (~ 5 µM), and suppresses tumor growth in tamoxifen-induced polyposis in APC knock-out murine model (100 mg/kg, i.p.).

Recently, Waaler et al. from Oslo University Hospital in Norway used this compound and showed that it blocks the PARP domain of tankyrase 1 and tankyrase 2, which leads to stabilization of AXIN2. They show that AXIN2 stabilization leads to increased degradation of β-catenin and reduced canonical Wnt signaling (signaling (IC_{50} = 470 nM in Wnt 3a-induced HEK293 cells transfected with ST-Luc). They have shown that JW55 inhibits canonical Wnt signaling in colon carcinoma cells containing mutations in either the APC locus or in an allele of β-catenin.



Waaler J, Machon O, Tumov, L, Dinh, H, Korinek V, Wilson SR, Paulsen JE, Pedersed, NM, Eide, TJ, Machonova, O, Gradl D, Voronkov A, von Kries JP, and Krauss, S (2012). Cancer Res. 72, 2822-2832.

Cancer (continued)

New Small Molecules & Inhibitors (continued)

Description	Details	Catalogue No.
PKM2 Activator II, DASA	A cell-permeable diarylsulfonamide (DASA) compound that acts as a potent and selective activator of tumor-specific M2 isozyme of pyruvate kinase (PKM2; AC_{50} = 65 nM). DASA treatment is shown to cause a diminution in cellular glutathione levels, and higher oxidative stress-induced cell death.	550602-10MG
RAD51 Inhibitor, B02	A cell-permeable pyridinylvinyl-quinazolinone compound that is shown to specifically inhibit human RAD51 (IC_{50} = 27.4 µM). Directly interacts with RAD51 (K_d = 5.6 µM), and disrupts its binding to DNA and nucleoprotein filament formation.	553525-25MG
RAGE Antagonist Peptide, RAP	An S100P-derived peptide based competitive antagonist for receptor for advanced glycation end product (RAGE). Shown to disrupt the interaction between RAGE and its ligands, such as S100P, S100A4 and HMGB-1 in binding assays and in multiple cancer cell lines (~2 µM).	553031-10MG
STAT3 Inhibitor XII, SPI	A cell-permeable STAT3 SH2 domain-derived (588-615) 28-mer peptide that competitively prevents STAT3 binding to cognate pTyr peptide motif, represses STAT3 dimerization, induces apoptosis and acts as a selective constitutive STAT3 activation inhibitor in several tumor cells at 50 µM.	573127-5MG
Survivin Inhibitor, YM155	A cell-permeable imidazolium derivative that suppresses survivin expression, blocks survivin promoter activity, and induces apoptosis in a variety of tumor cell lines (IC_{50} = 540nM) in a dose-dependent manner.	574662-10MG
Tankyrase1/2 Inhibitor IV, JW55	A cell-permeable phenylcarbamoylfuran-carboxamide compound that acts as a potent, selective, and reversible inhibitor of poly(ADP-ribosyl)ation activity of tankyrase 1 and 2 (IC_{50} = 1.9 and 0.83 µM, respectively). Shown to induce cell cycle arrest and diminish the proliferation of SW480 colorectal cancer cells (~ 5 µM).	575547-25MG
Threonine Dehydrogenase Inhibitor, QC1	A cell-permeable quinazolinecarboxamide (QC) compound that acts as a potent, reversible, and mixed noncompetitive inhibitor of threonine dehydrogenase activity (IC_{50} ~ 0.5 µM for mTDH). Shown to block threonine catabolism, induce autophagy and impede the growth of highly proliferating mouse embryonic stem cells (mESCs; EC_{50} ~3 µM).	603425-10MG
Thymidylate Kinase Inhibitor, YMU1	A cell-permeable, non-toxic pyridineisothiazolone compound that acts as a potent, reversible, and ATP-competitive inhibitor of human Thymidylate kinase (TMPK) (IC_{50} = 610 nM; K_i = 180 nM). Significantly increases (3 to 35 fold) the sensitivity of a variety of tumor cell lines to doxorubicin (Catalogue No. 324380).	606015-10MG
UbcH13 Inhibitor, NSC697923	A cell-permeable nitro-tosylfuran compound that selectively inhibits the E2 Ubiquitin-conjugating enzyme Ubc13- catalyzed K63-linked polyUb chain formation by preventing Ubc13-Ub thioester bond formation. Effectively inhibits Ubc13-Uev1A (UBE2V1) E2 complex-mediated NF-κB activation (Effective Conc. = 2 µM in HEK293T, MEF, RAW264.7, and SUDHL-6 cultures).	662107-25MG

For publications on using these small molecules, visit: www.merck4biosciences.com

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- No nucleic acid amplification
- No transfection
- No cell lysis
- No toxicity

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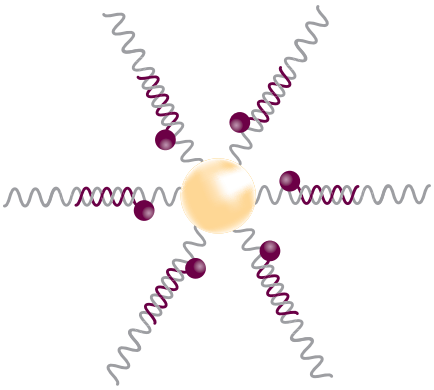

SmartFlare™ Probes – Cancer

Description	Catalogue No.
AFP Hu-Cy5 SmartFlare™ Probe	SF-469
ATM Hu-Cy5 SmartFlare™ Probe	SF-404
E-Cadherin Hu-Cy3 SmartFlare™ Probe	SF-423
E-Cadherin Hu-Cy5 SmartFlare™ Probe	SF-422
EGFR Hu-Cy5 SmartFlare™ Probe	SF-151
EGFR Ms-Cy5 SmartFlare™ Probe	SF-116
ERα Hu-Cy3 SmartFlare™ Probe	SF-106
ERα Hu-Cy5 SmartFlare™ Probe	SF-107
FGF2 Hu-Cy5 SmartFlare™ Probe	SF-493
FGFR2 Hu-Cy5 SmartFlare™ Probe	SF-405
HIF-1α Hu-Cy3 SmartFlare™ Probe	SF-164
HIF-1α Hu-Cy5 SmartFlare™ Probe	SF-122
HIF-1α Ms-Cy3 SmartFlare™ Probe	SF-185
HIF-1α Ms-Cy5 SmartFlare™ Probe	SF-186
KIT Hu-Cy5 SmartFlare™ Probe	SF-410
MAPK1 Hu-Cy3 SmartFlare™ Probe	SF-182
MAPK1 Hu-Cy5 SmartFlare™ Probe	SF-181
MAPK1 Ms-Cy3 SmartFlare™ Probe	SF-484
MAPK1 Ms-Cy5 SmartFlare™ Probe	SF-475
MET Hu-Cy5 SmartFlare™ Probe	SF-421
miR-101-3p Hu-Cy5 SmartFlare™ Probe	SF-403
miR-106b-5p Hu-Cy5 SmartFlare™ Probe	SF-436
miR-125b-5p Hu-Cy5 SmartFlare™ Probe	SF-467
miR-126-3p Hu-Cy5 SmartFlare™ Probe	SF-489
miR-132-3p Hu-Cy3 SmartFlare™ Probe	SF-428
miR-132-3p Hu-Cy5 SmartFlare™ Probe	SF-452
miR-143-3p Hu-Cy3 SmartFlare™ Probe	SF-426
miR-143-3p Hu-Cy5 SmartFlare™ Probe	SF-488
miR-145-5p Hu-Cy5 SmartFlare™ Probe	SF-481
miR-150-5p Hu-Cy5 SmartFlare™ Probe	SF-435
miR-155-5p Hu-Cy3 SmartFlare™ Probe	SF-183
miR-155-5p Hu-Cy5 SmartFlare™ Probe	SF-184
miR-15-5p Hu-Cy5 SmartFlare™ Probe	SF-486
miR-15a-5p Hu-Cy5 SmartFlare™ Probe	SF-430
miR-15b-5p Hu-Cy3 SmartFlare™ Probe	SF-427
miR-16-5p Hu-Cy3 SmartFlare™ Probe	SF-149
miR-16-5p Hu-Cy5 SmartFlare™ Probe	SF-178
miR-17-5p Hu-Cy3 SmartFlare™ Probe	SF-179
miR-17-5p Hu-Cy5 SmartFlare™ Probe	SF-180
miR-181a-5p Hu-Cy5 SmartFlare™ Probe	SF-451
miR-183-5p Hu -Cy5 SmartFlare™ Probe	SF-437
miR-18a-5p Hu-Cy5 SmartFlare™ Probe	SF-496
miR-194-5p Hu-Cy5 SmartFlare™ Probe	SF-434
miR-196a-5p Hu-Cy5 SmartFlare™ Probe	SF-468
miR-199b-3p Hu-Cy5 SmartFlare™ Probe	SF-443
miR-200c-3p Hu-Cy5 SmartFlare™ Probe	SF-450
miR-205-5p Hu-Cy5 SmartFlare™ Probe	SF-419
miR-208a Hu-Cy5 SmartFlare™ Probe	SF-431
miR-215 Hu-Cy5 SmartFlare™ Probe	SF-429
miR-21-5p Hu-Cy3 SmartFlare™ Probe	SF-471
miR-222-3p Hu-Cy5 SmartFlare™ Probe	SF-432
miR-223-3p Hu-Cy5 SmartFlare™ Probe	SF-495
miR-22-3p Hu-Cy5 SmartFlare™ Probe	SF-466
miR-29a-3p Hu-Cy5 SmartFlare™ Probe	SF-424
miR-29b-3p Hu-Cy3 SmartFlare™ Probe	SF-425
miR-29b-3p Hu-Cy5 SmartFlare™ Probe	SF-487
miR-30c-5p Hu-Cy3 SmartFlare™ Probe	SF-441
miR-30c-5p Hu-Cy5 SmartFlare™ Probe	SF-457
miR-31-5p Hu-Cy5 SmartFlare™ Probe	SF-445
miR-424-5p Hu-Cy5 SmartFlare™ Probe	SF-408
miR-451 Hu-Cy3 SmartFlare™ Probe	SF-192
miR-451 Hu-Cy5 SmartFlare™ Probe	SF-191
miR-542-3p Hu-Cy5 SmartFlare™ Probe	SF-420
RB1 Hu-Cy5 SmartFlare™ Probe	SF-407
Twist Hu-Cy3 SmartFlare™ Probe	SF-111
Twist Hu-Cy5 SmartFlare™ Probe	SF-110
Twist Ms-Cy5 SmartFlare™ Probe	SF-127
VEGF Ms-Cy5 SmartFlare™ Probe	SF-120
Vimentin Hu-Cy5 SmartFlare™ Probe	SF-462
Vimentin Rt-Cy5 SmartFlare™ Probe	SF-473

SmartFlare™ Probes – General

Description	Catalogue No.
miRNA Scramble-Cy3 Control SmartFlare™ Probe	SF-147
miRNA Scramble-Cy5 Control SmartFlare™ Probe	SF-146
Scramble Cy3+Uptake Cy5 Control SmartFlare™ Probe	SF-105
Scramble Cy5+Uptake Cy3 Control SmartFlare™ Probe	SF-104
Scramble-Cy3 Control SmartFlare™ Probe	SF-103
Scramble-Cy5 Control SmartFlare™ Probe	SF-102
Uptake-Cy3 Control SmartFlare™ Probe	SF-114
Uptake-Cy5 Control SmartFlare™ Probe	SF-137

Cell Structure

New Antibodies, Kits, & Proteins

Description	Host	Species Reactivity	Key Applications	Catalogue No.
Antibodies				
Anti-ACF7/MACF1a	Rabbit	Hu	IHC, Dot Blot, IC	ABT137
Anti-Anillin, clone 5F3.1	Mouse	Hu	WB, IC	MABT96
Anti-CDON	Rabbit	Hu, Ms	WB	ABT150
Anti-Cenexin, clone 2F6.1	Mouse	Hu	WB	MABT154
Anti-CHAD	Rabbit	Hu	WB	ABT297
Anti-CLDN4	Rabbit	Hu, Ms	WB	ABT305
Anti-DSG2	Rabbit	Hu	WB	ABT290
Anti-Fibromodulin	Rabbit	Hu	WB	ABT124
Anti-Fibromodulin	Rabbit	Hu	WB	ABT300
Anti-GCC185	Rabbit	Hu, Ms	IHC(P), IC	ABT162
Anti-KIF3B	Rabbit	Hu	WB, IC	ABT97
Anti-Lamellipodin	Rabbit	Hu, Ms, Rt	WB, IC	ABT133
Anti-Laminin α1/β1, clone AL-4	Rat	Ms	WB, IC	MAB1905-I
Anti-MYH11	Rabbit	Hu, Ms	WB, IHC	ABT293
Anti-MYLPF	Rabbit	Ms, Hu	WB	ABT299
Anti-Occludin	Rabbit	Hu	WB	ABT146
Anti-PITRM1	Rabbit	Hu, Ms	WB	ABT303
Anti-POSTN	Rabbit	Hu, Rt	WB, IHC	ABT292
Anti-Shugoshin-like 1	Rabbit	Hu, Ms, Rt	WB, IC	ABT118
Anti-STX8	Rabbit	Hu	WB, IHC, IC	ABT298
Anti-TAGLN	Rabbit	Hu, Ms	WB, IHC	ABT304
Anti-TGN46	Rabbit	Hu, Ms, Rt, Canine	WB, IP, IC	ABT95
Anti-TPX2	Rabbit	Hu	WB, IP, IC	ABT177
Anti-TRIM54	Rabbit	Hu	WB, IF	ABT302
Anti-ZMPSTE24	Rabbit	Hu	WB, IHC	ABT294
Milli-Mark™ Anti-Integrin α3-APC, clone P1B5	Mouse	Hu	FC	FCMAB387APC
Kits & Assays				
LentiBrite™ GFP Control Lentiviral Biosensor			Transfection, IF, IC	17-10387
LentiBrite™ RFP Control Lentiviral Biosensor			Transfection, IF, IC	17-10409
QCM™ High Sensitivity Non-cross-linked Collagen Invasion Assay, 24-well (8 µm), Colorimetric			Invasion Assay	ECM1401
Proteins & Enzymes				
PAK1, active; 10 µg			Kinase Assay	14-927
PAK1, active; 250 µg			Kinase Assay	14-927M
PAK1, active; BULK			Kinase Assay	14-927-K

PUBLICATION HIGHLIGHT ON NEW ANTIBODIES:

Merck Millipore is pleased to announce the introduction of Anti-TPX2 antibody (Catalogue No. ABT177) to their portfolio. This antibody can be used for detection of TPX2 by Western blotting, immunocytochemistry, or by immunoprecipitation in human samples. TPX2 is a microtubule-associated protein that recruits Aurora A kinase to microtubules during mitosis. The N-terminal domain of TPX2 interacts with Aurora A and protects Thr288 in its T-loop from dephosphorylation by PP1.

Recently, Aguirre-Portoles et al. from the Spanish National Cancer Research Center in Madrid, Spain reported that TPX2 is essential for maintaining the genomic stability and any subtle change in its expression can favor tumor development. They also report that lack of TPX2 caused early embryonic lethality during pre-implantation stage in mice. They indicate that TPX2+/- mice are more prone to develop a wide spectrum of tumors and suggest that TPX2 may act as a tumor suppressor by protecting the genomic stability of cells. They hypothesize that TPX2+/- mice accumulate aneuploidy with advancing age, which increases their genetic instability and makes them more susceptible to tumor development.

Aguirre-Portoles, C., et al. 2012. Tpx2 Controls Spindle Integrity, Genome Stability, and Tumor Development. Cancer Res. 72, 1518–28.

For published studies using this new product, visit: www.merckmillipore.com

For publications on using these small molecules, visit: www.merck4biosciences.com

LEGEND
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New Small Molecules & Inhibitors

Description	Details	Catalogue No.
Mitochondrial Fusion Promoter, M1	A cell-permeable phenylhydrazone that restores mitochondrial tubular network formation in MEF lacking either of the two outer mitochondrial membrane (OMM) mitofusins (EC_{50} = 5.3 and 4.42 mM, respectively, in Mfn1 or Mfn2 knockout MEF cells).	475859-25MG

New Antibodies, Kits, & Proteins

Description	Host	Species Reactivity	Key Applications	Catalogue No.
Antibodies				
Anti-acetyl-Histone H3 (Lys56)	Rabbit	Hu	WB, Dot Blot, ChIP	07-677-I
Anti-acetyl-phospho Histone H1.4/H3 (Lys26/Lys9,Ser27/Ser10)	Rabbit	Hu, Ms, Rt	Dot Blot, IP	ABE375
Anti-ARID1B	Rabbit	Hu	WB, IP	ABE316
Anti-Arsenite methyltransferase	Rabbit	Hu	WB, IHC (P)	ABE405
Anti-ATF4	Rabbit	Hu	WB, ChIP	ABE387
Anti-Cohesin subunit SA-2	Rabbit	Hu	WB, IP, IC	ABE394
Anti-CSTF1	Rabbit	Hu	WB	ABE583
Anti-Dicer1, clone N167/7	Mouse	Rt, Ms, Hu	WB, IHC	MABN461
Anti-Dnmt2	Rabbit	Hu	IHC, WB	ABE404
Anti-Elongator complex protein 3	Rabbit	Hu	IP, IHC (P)	ABE395
Anti-FKBP5	Rabbit	Hu	WB, IHC	ABE580
Anti-HOXD13	Rabbit	Hu, Ms	WB, IHC	ABE581
Anti-MeCP2, clone 4H7	Rat	Ms, Porcine, Rt	WB, IP, ChIP, IC, IHC	MABE328
Anti-Mili/Piwil-2, clone 13E-3	Mouse	Ms	WB, IP, IC	MABE363
Anti-NIPP-1	Rabbit	Hu, Ms	WB, IC	ABC61
Anti-N-lysine methyltransferase SMYD2	Rabbit	Hu, Ms	WB, IP, IHC (P)	ABE329
Anti-phopsho-RNAPII (Thr4), clone 1G7	Rat	Hu, Ms, Yeast	WB, IP, IC, ChIP	MABE348
Anti-phospho-RNAPII (Tyr1), clone 3D12	Rat	Hu	WB, IP, ChIP	MABE350
Anti-phospho-STAT2 (Tyr689)	Rabbit	Hu, Ms	IP	ABE541
Anti-PRMT6	Rabbit	Hu	WB	ABE124
Anti-RBBP5, clone 3H5.1	Mouse	Hu, Ms, Rt	WB, IC	MABE220
Anti-SET and MYND domain-containing protein 3 (SMYD3)	Rabbit	Hu, Ms, Rt, Chimpanzee	WB, IHC (P)	ABE315
Anti-SNF2L, clone SNF 2C4	Rat	Hu	WB, IHC	MABE366
Anti-Suv4–20h2, clone 6B9	Rat	Hu	WB	MABE369
Anti-TGFβ2-Specific	Rabbit	Hu	WB, IHC, IC	ABE586
Anti-TRAF3	Rabbit	Hu, Ms	WB, IHC	ABE585
Anti-Tristetraprolin (TTP), clone hTTP-214	Mouse	Hu	WB	MABE65
Anti-WHSC1/NSD2, clone 29D1	Mouse	Hu	WB, ChIP, IP	MABE191
Anti-Zeb 1	Rabbit	Ms, Hu, Bov, Chicken, Frog	WB	ABD53
Anti-ZEB1	Rabbit	Hu	WB, IC	ABN285
Milli-Mark™ Anti-Chk2-FITC, clone 7	Mouse	Hu	FC	FCMAB424F
Milli-Mark™ Anti-HDAC2-PE, clone 3F3	Mouse	Hu	FC	FCMAB423PE
Kits & Assays				
CpGenome™ 5-hmC Quantitation Kit				17-10091
CpGenome™ 5-mC & 5-hmC Human DNA Standards		Hu	DNA Methylation Assay	S8003
CpGenome™ 5-mC & 5-hmC Mouse DNA Standards		Ms	DNA Methylation Assay	S8004

PUBLICATION HIGHLIGHT ON NEW ANTIBODIES:

Merck Millipore's newly released Anti-phospho-RNAPII (Tyr1), clone 3D12 monoclonal antibody (MABE350) has been published in an important study describing a key mechanism in the DNA transcription process. In the recent A. Mayer et al. Science paper entitled: **"CTD tyrosine phosphorylation impairs termination factor recruitment to RNA polymerase II"***

The Munich-based researchers show that the C-terminal domain (CTD) of actively elongating Pol II is phosphorylated at conserved tyrosine residues and that this modification impairs recruitment of key termination factors. Using the well characterized clone 3D12 monoclonal antibody they showed that CTD domain is phosphorylated at Tyr1, in addition to the previously known two serine sites. Further, they used the 3D12 clone in ChIP-chip to reveal that genome-associated Pol II is phosphorylated at Tyr1. Their results expand our understanding of critical, ancient eukaryotic DNA transcription, by extending the previously proposed CTD code for the coordination of the transcription cycle with factor recruitment.

*Science (2012) 336:1723-1725.

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New Small Molecules & Inhibitors

Description	Details	Catalogue No.
JMJD Histone Demethylase Inhibitor III	A substrate (methyl lysine) and cofactor (α-ketoglutarate) mimicking bivalent benzylamino-butylamino-N-hydroxybutenoic acid compound that acts as a selective *in vitro* inhibitor of Jumonji domain-containing histone demethylases (JHDMs; IC_{50} = 4.3, 3.4, 5.9, 10 and 43 µM for JMJD2A, JMJD2C, JMJD2E, PHF8 and JMJD3, respectively).	420202-5MG
JMJD Histone Demethylase Inhibitor IV, Methylstat	A methyl ester prodrug of *in vitro* active N-hydroxybutenoic acid compound that is shown to preferentially induce hypermethylation of histone proteins (EC_{50} for H3K4me3 and H3K9me3 = 10.3 and 8.6 µM in KYSE150 cells, and 6.7 and 6.3 µM in MCF7 cells, respectively), and arrests cell growth.	420203-10MG

LEGEND

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Neuroscience

NEW ANTIBODIES, KITS, & PROTEINS

Description	Host	Species Reactivity	Key Applications	Catalogue No.
Antibodies				
Anti-Achaete-scute homolog 1, clone 6D8.1	Mouse	Hu	WB, IHC	MABD64
Anti-Aldh1L1, clone N103/39	Mouse	Hu, Ms, Rt	WB, IHC	MABN495
Anti-AMIGO-1, clone L86/33	Mouse	Rt, Hu	WB, IHC	MABN499
Anti-ARL6IP6	Rabbit	Hu, Ms, Bov	WB, IHC (P)	ABN208
Anti-ARPC3	Rabbit	Hu, Ms		ABN176
Anti-ASIC1, clone N271/44	Mouse	Rt, Ms	WB, IHC	MABN462
Anti-AXL	Rabbit	Hu	WB	ABN275
Anti-BICD2	Rabbit	Hu	WB, IHC	ABN332
Anti-BMP2	Rabbit	Hu, Ms	WB, IHC	ABN303
Anti-BRAL1	Rabbit	Hu	WB, IHC	ABN349
Anti-Brevican, clone N294A/6	Mouse	Hu, Rt	WB, IHC	MABN491
Anti-CAPS-1	Rabbit	Ms, Rt, Hu	WB, IHC	ABN329
Anti-CAPS-2	Rabbit	Hu, Ms, Rt	WB, IHC	ABN326
Anti-Cav3.1, Ca^{2+} channel, clone N178A/9	Mouse	Ms, Rt	WB, IHC	MABN464
Anti-Copper ATPase 1 (Menke's disease protein), clone L60/4	Mouse	Hu, Rt	WB, IHC	MABN470
Anti-CROP	Rabbit	Hu	WB, IHC	ABN312
Anti-C-type lectin-like domain family 1 (CLECL1)	Rabbit	Hu	WB, IHC (P)	ABN166
Anti-CXCR7	Rabbit	Hu	WB	ABN279
Anti-CYP24A1	Rabbit	Hu	WB	ABN201
Anti-Dicer1, clone N167/7	Mouse	Rt, Ms, Hu	WB, IHC	MABN461
Anti-DISC1	Rabbit	Hu, Rt, Ms	IHC, IC, WB	ABN308
Anti-DMBT1	Rabbit	Hu	IHC (P)	ABN256
Anti-Doc2b Protein, clone N150/21	Mouse	Rt, Ms	WB	MABN477
Anti-Dopamine D3 receptor, clone N331/19	Mouse	Rt, Hu	IHC, IC	MABN463
Anti-EVI-5	Rabbit	Ms, Rt, Hu	IHC, WB	ABN194
Anti-F4/80, clone 18G2.1	Mouse	Hu	WB	MABN158
Anti-FA2H	Rabbit	Hu	WB, IHC	ABN310
Anti-FDPS	Rabbit	Hu, Ms	WB	ABN283
Anti-FEZ2	Rabbit	Ms, Hu	WB, IF	ABN342
Anti-FEZ2 (C-terminus)	Rabbit	Hu, Ms	WB, IF	ABN341
Anti-Fig4/Sac3, clone N202/7	Mouse	Ms, Rt	WB	MABN494
Anti-FOXM1	Rabbit	Hu, Rt	WB, IHC	ABN286
Anti-FZR1	Rabbit	Hu	WB	ABN288
Anti-GABA(A)R, α1 Protein, clone N95/35	Mouse	Ms, Rt	WB, IHC	MABN489
Anti-GABA(B)R2 Protein, clone N81/2	Mouse	Hu, Ms, Rt	WB, IHC	MABN488
Anti-GPR65	Rabbit	Hu, Rhesus Macaque	IHC	ABN203
Anti-Gsh2	Rabbit	Hu, Ms, Chimpanzee, Horse	WB, IHC	ABN104
Anti-HCCS	Rabbit	Hu	WB, IHC	ABN301
Anti-HEXB	Rabbit	Hu	WB, IHC	ABN264
Anti-IL22RA2	Rabbit	Hu	WB, IHC (P)	ABN164
Anti-KIF5A	Rabbit	Hu, Ms	WB, IC	ABN266
Anti-KLF6, clone 12A8.3	Mouse	Hu, Ms	WB, IHC	MABN119
Anti-KLF7, clone 8G8.1	Mouse	Hu	WB	MABN120
Anti-LDHA	Rabbit	Hu	WB, IHC, IF	ABN311

For published studies using this new product, visit: www.merckmillipore.com

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Neuroscience (continued)

NEW ANTIBODIES, KITS, & PROTEINS

Description	Host	Species Reactivity	Key Applications	Catalogue No.
Anti-LGI1	Rabbit	Hu, Ms, Rt	WB, IHC	ABN307
Anti-LGI2	Rabbit	Hu	WB	ABN335
Anti-LGI3	Rabbit	Hu	WB	ABN351
Anti-LGI4	Rabbit	Hu	WB	ABN347
Anti-LGI4 (C-terminus)	Rabbit	Rt, Hu	WB	ABN346
Anti-LRFN2	Rabbit	Hu, Ms, Rt	WB, IHC	ABN339
Anti-LRFN4	Rabbit	Ms, Hu	WB, IHC	ABN337
Anti-LRFN5	Rabbit	Ms, Hu	WB, IHC	ABN340
Anti-MANF	Rabbit	Hu, Ms, Rt	WB, IHC	ABN306
Anti-MAO-A, clone 6G11.E1	Mouse	Hu	WB	MABN306
Anti-MMEL1	Rabbit	Hu, Ms, Rt	IHC, WB	ABN165
Anti-MZB1	Rabbit	Hu	WB, IHC	ABN274
Anti-NAV1	Rabbit	Ms, Hu	WB	ABN291
Anti-NCAM1	Mouse	Ms, Rt	WB, IHC	MABN221
Anti-NENF	Rabbit	Hu, Rt	WB, IHC	ABN352
Anti-Neurotrypsin	Rabbit	Hu, Ms, Rt	WB, IHC	ABN333
Anti-NIPSNAP	Rabbit	Hu	WB, IHC	ABN343
Anti-NIPSNAP (N-terminus)	Rabbit	Hu, Ms	WB, IHC	ABN354
Anti-NR1H2 (LXR β), clone 1E1.1	Mouse	Hu	WB	MABN82
Anti-PANK2	Rabbit	Hu	WB	ABN259
Anti-PANX1	Rabbit	Hu	WB	ABN270
Anti-PRDX1	Rabbit	Hu	WB, IHC, IF	ABN268
Anti-Precerebellin	Rabbit	Hu, Ms	WB, IHC	ABN304
Anti-PSD93, clone N18/30	Mouse	Ms, Hu, Rt	WB, IHC	MABN497
Anti-PTGDS	Rabbit	Hu, Rhesus Macaque	WB, IHC	ABN253
Anti-PTGES2	Rabbit	Hu	WB, IHC	ABN282
Anti-Rcan2	Rabbit	Hu, Rt, Ms	WB, IHC	ABN328
Anti-SAPAP1	Rabbit	Hu	WB, IHC	ABN309
Anti-SAPAP2	Rabbit	Hu, Ms	WB, IHC	ABN353
Anti-SAPAP3	Rabbit	Ms, Rt, Hu	WB, IHC	ABN325
Anti-SAPAP4	Rabbit	Hu, Rt	WB, IHC	ABN334
Anti-SCRAPPER	Rabbit	Hu	WB, IHC	ABN327
Anti-SLC17A1	Rabbit	Hu	WB	ABN276
Anti-SLC22A12	Rabbit	Hu	WB	ABN273
Anti-Slitrk1 (C-terminus)	Rabbit	Rt, Hu	WB, IHC	ABN345
Anti-Slitrk4	Rabbit	Hu, Ms	WB, IHC	ABN338
Anti-Slitrk5	Rabbit	Ms, Hu	WB, IHC	ABN344
Anti-SNRPE	Rabbit	Hu	WB, IHC	ABN313
Anti-Sox1, clone 2B3.3	Mouse	Ms	WB	MABN155
Anti-SUMF2	Rabbit	Hu	WB, IHC	ABN265
Anti-TMEM106B, clone TME-N 6F2	Rat	Hu, Rt	WB, IF	MABN473
Anti-TTBK1	Rabbit	Hu, Ms	WB, IHC	ABN348
Anti-TTC8	Rabbit	Hu, Ms, Primate, Horse, Porcine	WB, IHC	ABN209
Anti-TXN	Rabbit	Hu	WB, IHC, IF	ABN277
Anti-ZFP36L1	Rabbit	Hu, Ms, Rt, Bov, Horse, Canine	WB	ABN192
Milli-Mark™ Anti-GABA A Receptor b2/3-PE, clone 62-3G1	Mouse	Rt	FC	FCMAB408PE
Milli-Mark™ Anti-Reelin-FITC, a.a. 164-496, clone G10	Mouse	Hu, Ms	FC	FCMAB341F

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Neuroscience (continued)

NEW ANTIBODIES, KITS, & PROTEINS

Description	Host	Species Reactivity	Key Applications	Catalogue No.
Proteins & Enzymes				
LRRK2, active			Kinase Assay	14-919
LRRK2, active			Kinase Assay	14-919-K
LRRK2, active			Kinase Assay	14-919M

New Small Molecules & Inhibitors

Description	Details	Catalogue No.
Dopamine Receptor Antagonist II, Thioridazine, HCl	A phenothiazine class antipsychotic and dopamine receptor (DR) antagonist that is reported to exhibit cancer stem cells differentiating (EC_{50} ≤9.4 µM for v1H9) and anti-leukemic activity, without affecting non-neoplastic H9 hESC, adult fibroblast-derived iPSC, or hematopoietic stem-progenitor cells.	324387-2GM
KMO Inhibitor II, JM6	An orally bioavailable *in vivo* prodrug of KMO Inhibitor I, Ro 61-8048 (Catalogue No. 420361) that is shown to be metabolically unstable and slowly release Ro 61-8048 in blood and act as a neuroprotectant. Shown to prevent synaptic loss and behavioral deficits in AD and HD mouse model and increase the survival.	420361-10MG
Prolyl Endopeptidase Inhibitor III, KYP-2047	A cell-permeable, potent, fast-acting, and selective inhibitor of prolyl oligopeptidase (PREP) (K_i = 23 pM). Reported to cross the blood-brain barrier.	537012-5MG

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New Antibodies, Kits, & Proteins

Description	Host	Species Reactivity	Key Applications	Catalogue No.
Antibodies				
Anti-CASK	Rabbit	Hu, Ms, Rt	WB	ABS225
Anti-CXCL10	Rabbit	Hu	ELISA	ABF50
Anti-Cytochrome P450 (scc), a.a. 421-441	Rabbit	Rt	WB, IHC (P)	ABS235
Anti-Cytochrome P450 (SCC), a.a. 509-526	Rabbit	Rt	WB, IHC (P)	ABS236
Anti-DKK1	Rabbit	Hu	WB, IHC, IF	ABS375
Anti-FKBPL	Rabbit	Hu	WB, IHC	ABS373
Anti-HOP, clone 17E8.1	Mouse	Hu	WB	MABS182
Anti-ITPA	Rabbit	Hu	WB, IHC, IC	ABS374
Anti-MAT1A	Rabbit	Hu	WB, IHC	ABS376
Anti-Neomycin Phosphotransferase II	Rabbit	Hu	WB	AC113
Anti-phospho-MKK4 (Ser257/Thr261)	Rabbit	Hu, Ms, Rt, Bov, Xenopus, Zebrafish	WB, Peptide Inhibition Assay	ABS160
Anti-phospho-RalA (Ser194)	Rabbit	Hu, Bov, Rt, Xenopus, Zebrafish	WB, Peptide Inhibition Assay	07-2119
Anti-phospho-RalB (Ser198)	Rabbit	Hu, Bov	Dot Blot, WB	ABS173
Anti-RIPK1	Rabbit	Hu	WB	ABS378
Anti-TALDO1	Rabbit	Hu, Ms	WB, IHC, IC	ABS377
Anti-TBXAS1	Rabbit	Hu	WB, IHC	ABS372
Anti-TPMT	Rabbit	Hu	WB, IHC	ABS380
Kits & Assays				
PI 3-Kinase 3-step HTRF® Assay		Hu, Ms	Kinase Assay	33-040
PI 3-Kinase 3-step HTRF® Assay		Hu, Ms	Kinase Assay	33-041
PI 3-Kinase Class II HTRF® Assay		Hu, Ms	Kinase Assay	33-038
PI 3-Kinase Class II HTRF® Assay		Hu, Ms	Kinase Assay	33-039
PIP4-Kinase HTRF® Assay		Hu, Ms	Kinase Assay	33-054
PIP4-Kinase HTRF® Assay		Hu, Ms	Kinase Assay	33-055
PIP5-Kinase HTRF® Assay		Hu, Ms	Kinase Assay	33-125
Proteins & Enzymes				
CLK4, active			Kinase Assay	14-917
CLK4, active			Kinase Assay	14-917-K
CLK4, active			Kinase Assay	14-917M
IKKε, active; 10 ug			Kinase Assay	14-926
IKKε, active; 250 ug			Kinase Assay	14-926M
IKKε, active; BULK			Kinase Assay	14-926-K
JAK1, active			Kinase Assay	14-918
JAK1, active			Kinase Assay	14-918-K
JAK1, active			Kinase Assay	14-918M
TYK2, active; 10 ug			Kinase Assay	14-924
TYK2, active; 250 ug			Kinase Assay	14-924M
TYK2, active; BULK			Kinase Assay	14-924-K
Wee1, active			Kinase Assay	14-925
Wee1, active			Kinase Assay	14-925-K
Wee1, active			Kinase Assay	14-925M

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Signaling (continued)

New Small Molecules & Inhibitors

Description	Details	Catalogue No.
Autotaxin Inhibitor IV, HA155	A highly potent (IC_{50} = 5.7 nM) para-isomer boronate analog of Autotaxin Inhibitor II, HA130 (Catalogue No. 189511) that efficiently blocks thrombin-stimulated lysophosphatidic acid secretion in platelets and in mammalian cells.	189513-10MG
Casein Kinase I Inhibitor V, LH846	A cell-permeable benzothiazolo compound that acts a potent, selective, and reversible inhibitor of CKIδ (IC_{50} = 290 nM). Shown to block CKIδ-dependent period protein PER1 phosphorylation and diminish its proteasomal degradation in a dose-dependent manner.	218850-10MG
Cryptocrome Activator, KL001	A cell-permeable carbazole compound that competes against FAD (flavin adenine dinucleotide) for cryptocrome (CRY) 1 & 2 binding. Shown to selectively stabilize cellular CRY1/2 protein, effectively lengthening the period and reducing the amplitude of the circadian transcription rhythms of Bmal1 and Per2 promoter-mediated transcription activity.	233624-25MG
CXCR7 Agonist, VUF11207	A styrene-amide derivative that acts as a high affinity and high potency ligand of CXCR7 chemokine receptor (pK_i = 8.1) and induces the recruitment of β-arrestin 2 and subsequent interenalization of CXCR7.	239824-10MG
Fucosyltransferase Inhibitor, 2F-Peracetyl-Fucose	A cell-permeable fluorinated fucose derivative that acts as an inhibitor of fucosyltransferases following its uptake and metabolic transformation into a GDP-fucose mimetic.	344827-10MG
HNF4 Antagonist, BI6015	A cell-permeable phenylsulfonylbenzimidazole that is shown to dock in the ligand-binding pocket of both HNF4α and HNF4γ and antagonize HNF4α DNA binding activity in HepG2 cells (by 93%; 10 µM overnight), effectively inhibiting HNF4α-dependent cellular activities (Effective conc. 1 to 5 µM).	375240-25MG
InSolution™ CFTR Inhibitor-172	A cell-permeable 2-thio-4-thiazolidinone compound that acts as a potent, reversible, rapid, and voltage-independent inhibitor of CFTR (cystic fibrosis transmembrane conductance regulator)-mediated Cl- transport in human airway cells (K_i ~ 300 nM).	219674-5MG
InSolution™ IRAK-1/4 Inhibitor	A cell-permeable benzimidazole compound that acts as a potent and selective inhibitor of interleukin-1 receptor-associated kinases (IC_{50} = 300 nM and 200 nM for IRAK-1 and -4). Shown to exhibit little activity against a panel of 27 other kinases (IC_{50} >10 µM), including lck and src.	407602-5MG
InSolution™ PARP Inhibitor VIII, PJ34	A water-soluble phenanthridinone derivative that acts as a potent anti-inflammatory agent and a reversible inhibitor of poly(ADP-ribose) polymerase (PARP; EC_{50} = 20 nM). Suppresses neutrophil infiltration and nitric oxide production in peritonitis.	528151-2MG
IRE1 Inhibitor III, 4u8C	A cell-permeable coumarin o-hydroxyaldehyde that inhibits IRE1 RNase activity in a time- and dose-dependent manner (IC_{50} = 550 and 45 nM, respectively, with 0 and 16 min drug preincubation in RNA cleavage assays).	412512-25MG

For publications on using these small molecules, visit: www.merck4biosciences.com

New Small Molecules & Inhibitors (continued)

Description	Details	Catalogue No.
JAK3 Inhibitor VIII, NSC114792	A cell-permeable steroidal-purinethione compound that targets JAK3 kinase domain and selectively inhibits JAK3, but not JAK1, JAK2, or TYK2, activity in cell-free immuncomplex kinase assays, and effectively blocks the constitutive Jak3 and STAT5 phosphorylations (complete inhibition at 10 µM) in BaF3-JAK3V674A and BLNK-/- BKO84 culltures.	420146-10MG
LYP Inhibitor II, LTV-1	A cell-permeable thiobarbituryl-benzoate compound that acts as a highly potent and reversible inhibitor of lymphoid tyrosine phosphatase (LYP) (IC_{50} = 508 nM) and thereby enhances TCR signaling in intact cells.	540218-10MG
MyoVin-1	A pyrazolopyrimidine compound that blocks ADP release from the actomyosin complex and acts as a potent, reversible and uncompetitive inhibitor of actin-stimulated ATPase activity of myosin V (K_i = 6.3 and 5.5 µM by single- and double-headed myosin V).	475984-5MG
Nucleic Acid Sensing TLRs Antagonist E6446-02	An isoxazolyl compound that specifically inhibits the endosomal activation of nucleic acid-sensing TLRs (IC_{50} ~ 0.03, < 8.0 and ~ 30 µM for TLR9, TLR7/8 and TLR4 in agonist stimulated HEK293 cells stably transfected with TLR9/TLR7/TLR4 and ELAM-1-luciferase, respectively) and acts as a selective TLR9 antagonist.	614315-10MG
REV-ERB Agonist II, SR9009	A pyrrolidinecarbamate compound that acts as a specific REV-ERB-α/β agonist. Exhibits a direct and reversible binding (K_d = 800 nM REV-ERB-α) and shows excellent selectivity over a panel of 46 other nuclear receptors.	554726-25MG
S1P1 Receptor Agonist III	An orally bioavailable polar head group lacking carbamoylnicotinamide compound that acts as a potent and reversible agonist of hS1P1 receptor (EC_{50} = 35 nM with 96% efficacy). Shown to efficiently reduce the circulating lymphocyte levels in rats (1 mg/kg, p.o.).	567734-10MG
Sialyltransferase Inhibitor, 3Fax-Peracetyl Neu5Ac	A cell-permeable sialylic acid analog that upon cellular uptake is transformed into a CMP-Neu5Ac mimetic bearing a C3 fluorine substituent at the axial position, effectively inhibiting sialyltransferase in a donor substrate CMP-Neu5Ac-competitive manner.	566224-10MG
Sphingosine Kinase 1 Inhibitor II, PF-54	A cell-permeable hydroxymethylpyrrolidine compound that acts as a highly potent, reversible inhibitor of sphingosine kinase 1 (SphK1) (IC_{50} = 2.7 nM; K_i = 3.6 nM against human SphK1), and exhibits ~130-fold greater selectivity for Sphk1 over SphK2 (IC_{50} = 356 nM).	567741-5MG
TRPML Agonist, ML-SA1	A membrane permeable dihydroquinolinyloxo-isoindolinedione compound that acts as a potent and selective agonist of lysosomal mucolipin transient receptor potential (TRP) channel 1,2,3 (TRPML) in all mammalian cells. Shown to rapidly activate whole-endolysosome TRPML-like current and induce lysosomal Ca^{2+} release (~10 µM).	648493-25MG

For publications on using these small molecules, visit: www.merck4biosciences.com

Stem Cell Research

PUBLICATION HIGHLIGHT ON NEW ANTIBODIES:

Merck Millipore's newly released Anti-SSEA-5, clone 8e11 monoclonal antibody (MABD88) has been published in an important cancer study describing how an antibody to a novel antigen can remove teratoma-formation potential from incompletely differentiated hESC cultures. In the recent Nature Biotechnology paper entitled: **"An antibody against SSEA-5 glycan on human pluripotent stem cells enables removal of teratoma-forming cells"***

C. Tang and collaborators raised a monoclonal antibody against hESCs, designated anti-stage-specific embryonic antigen (SSEA)-5, which binds a previously unidentified antigen highly and specifically expressed on hPSCs—the H type-1 glycan. Through extensive characterization, including Western blotting, flow cytometry, and immunocytochemistry, the Stanford University researchers were able to not only show specificity, but demonstrate that the 8e11 clone could alone greatly deplete the teratoma-initiation potential of partially differentiated cultures. In combination with relatively few additional markers, the researchers are significantly closer to creating a universally applicable protocol for prospective removal of residual undifferentiated cells and greatly improving the safety of hPSC therapies.

* Nature Biotechnology (2011) 29:829-834.

New Antibodies, Kits, & Proteins

Description	Host	Species Reactivity	Key Applications	Catalogue No.
Antibodies				
Anti-BCRP1, clone 5D3, Alexa Fluor® 488 conjugate	Mouse	Hu, Rt	IC	MAB4155A4
Anti-BCRP1, clone 5D3, Cy3 conjugate	Mouse	Hu	IC	MAB4155C3
Anti-CD349/Frizzled 9, clone W3C4	Mouse	Hu	FC	MABD86
Anti-Dax1	Rabbit	Hu, Rt	WB, IHC (P)	ABD77
Anti-Nuclei, clone 235-1, Alexa Fluor® 488 conjugate	Mouse	Hu	IC	MAB1281A4
Anti-Nuclei, clone 235-1, Cy3 conjugate	Mouse	Hu	IC	MAB1281C3
Anti-Podocalyxin-like protein I (Cytotoxic), clone mAb 84	Mouse	Hu	WB, IC, FC	MABD89
Anti-SSEA-5, clone 8e11	Mouse	Hu	FC, IC	MABD88
Kits & Assays				
OsteoMAX-XF™ Differentiation Medium			Cell Culture, Stem Cell Culture	SCM121
Cell Lines				
EmbryoMax® Primary Mouse Embryo Fibroblasts, Neo Resistant, Not Mitomycin C treated, Strain FVB, passage 1			Stem Cell Culture	PMEF-NL-P1
EmbryoMax® Primary Mouse Embryo Fibroblasts, Not Mitomycin C Treated, Strain CF1, passage 1			Stem Cell Culture	PMEF-CFL-P1

New Small Molecules & Inhibitors

Description	Details	Catalogue No.
AhR Antagonist II, SR1	A cell-permeable purine compound that acts as a high affinity (IC_{50} = 40 nM against [^{125}I]-N3Br2DD binding to human AhR) AhR antagonist (IC_{50} = 127 nM against 3 nM TCDD-induced luciferase reporter activity in HepG2 cultures. Enhances proliferation and expansion of hematopoietic stem cells.	182706-5MG
Dopamine Receptor Antagonist II, Thioridazine, HCl	A phenothiazine class antipsychotic and dopamine receptor (DR) antagonist that is reported to exhibit cancer stem cells differentiating (EC_{50} ≤9.4 µM for v1H9) and anti-leukemic activity, without affecting non-neoplastic H9 hESC, adult fibroblast-derived iPSC, or hematopoietic stem-progenitor cells.	324387-2GM
Hepatic Differentiation Inducer, SJA710-6	A cell-permeable imidazopyridinamine compound that selectively and potently induces differentiation of mesenchymal stem cells (MSCs) into hepatocyte-like cells (~47% at 5 µM).	375110-25MG
Hh Signaling Antagonist XI, MRT-14	A cell-permeable acylurea compound that acts as an antagonistic Smo ligand (IC_{50} = 120 nM against 5 nM Bodipy-cyclopamine binding to murine Smo-transfected HEK293 cells).	373277-10MG
InSolution™ Hh/Gli Antagonist, GANT61	A cell-permeable hexahydropyrimidine compound that acts as downstream Hedgehog (Hh) pathway-selective blockers and target Gli-mediated gene transactivation (IC_{50} ~5 µM) in SAG-stimulated Shh-L2 cells, and exhibits *in vivo* antitumor efficacy.	373403-2MG
Wnt Agonist I in DMSO	A cell-permeable, potent, and selective activator of Wnt signaling that does not inhibit the activity of GSK-3β (IC_{50} >60 µM). Shown to mimic the effect of Wnt and induce β-catenin and TCF (T-cell fate)-dependent transcriptional activity (EC_{50} = 700 nM in HEK-293T cells).	681664-2MG

For published studies using this new product, visit: www.merckmillipore.com

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LEGEND
Species: Hu=Human, Ms=Mouse, Rt=Rat, Bov=Bovine, Mky=Monkey
Applications: ChIP=Chromatin IP, FC=FlowCytometry, IC=Immunocytochemistry, IHC=Immunohistochemistry, IHC(P)=Immunohistochemistry (Paraffin), IF=Immunofluorescence, IP=Immunoprecipitation, WB= Western Blotting

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Lit No. PR4442ENEU BS-GEN-13-07829 Printed in the USA. 03/2013