

**PRMT1**

(Protein arginine N-methyltransferase 1; HMT2; HRMT1L2)

**CATALOG NO.:** HMT-11-119

**LOT NO.:**

**DESCRIPTION:** Human recombinant PRMT1 (residues 2-371 (C-terminus); Genbank Accession # NM\_001536) expressed with an N-terminal GST-tag, in *E. coli*. MW = 68.3 kDa. PRMT1, a type I arginine methyltransferase, catalyzes the transfer of a methyl group from S-adenosyl-L-methionine (SAM) to an  $\omega$ -nitrogen of the guanidino function of protein L-arginine residues ( $\omega$ -monomethylation) and the transfer of a second methyl group to the same nitrogen, yielding asymmetric dimethylarginine (aDMA)<sup>1,2</sup>. A ubiquitously expressed protein and the major source of histone H4 arginine-3 methylation (H4R3me1, H4R3me2a), PRMT1 also methylates other histones and numerous other substrates, accounting for about 85% of all arginine methylation in mammalian cells<sup>3</sup>. PRMT1 is essential to oncogenic transformation in mixed lineage leukemia (MLL), interacting with the MLL-EEN fusion protein in a transcription-activating complex also comprising histone acetyltransferase activity<sup>4</sup>. Methylation of Arg-260 in estrogen receptor  $\alpha$  (ER $\alpha$ ) by PRMT1 is required for its interaction with p85 and src and ER $\alpha$  hypermethylation is associated with a subset of breast cancers<sup>5</sup>. There is also evidence suggesting a role for elevated PRMT1 activity in heart disease<sup>6</sup> and asthma<sup>7</sup>. These various disease connections have made PRMT1 the target of recent HTS and drug discovery efforts<sup>8-10</sup>.

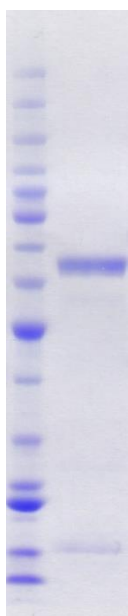
**PURITY:** >80% by SDS-PAGE.

**ASSAY CONDITIONS:** RBC's PRMT1 displays histone methyltransferase activity at enzyme concentrations of 15.6 nM and above, with various substrates, including histone H2A, GST-GAR, chicken core histones and histone H4, but with relatively low activity on histone H3.3 and HeLa Oligonucleosomes. Activity was determined as TCA-precipitated counts in a scintillation/filter plate assay (Multiscreen FB, Topcount). Reaction conditions: 50 mM Tris-HCl, pH 8.5, 50 mM NaCl, 5 mM MgCl<sub>2</sub>, 1 mM DTT, 1 mM PMSF, 1  $\mu$ M [<sup>3</sup>H]-SAM, 30°C, 60 min. with substrates as indicated (see Figure below).

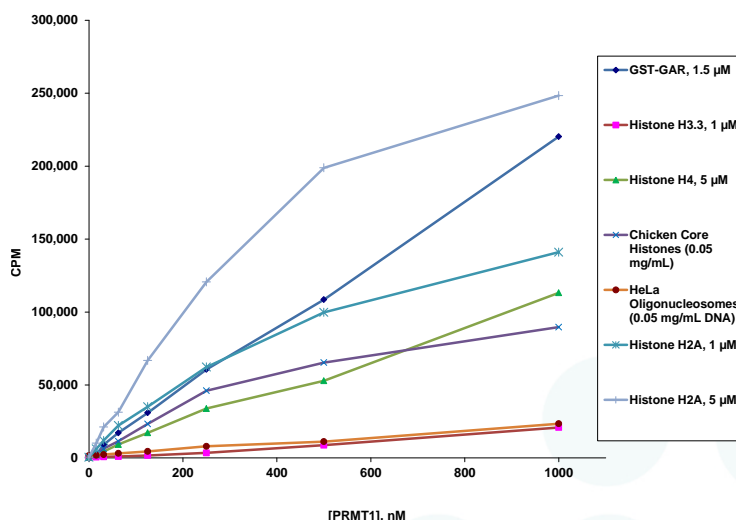
**SUPPLIED AS:** \_\_\_  $\mu$ g/ $\mu$ l in 25.4 mM Na<sub>2</sub>HPO<sub>4</sub> pH 7.4, 4.4mM KH<sub>2</sub>PO<sub>4</sub>, 137 mM NaCl, 2.7 mM KCl, 3 mM DTT, 30% (w/v) glycerol as determined by OD<sub>280</sub>

**STORAGE:** -70°C. Thaw quickly and store on ice before use. The remaining, unused, undiluted enzyme should be refrozen quickly by, for example, snap freezing in a dry/ice ethanol bath or liquid nitrogen. Freezing and storage of diluted enzyme is not recommended.

**REFERENCES:** 1) W. Lin *et al. J. Biol. Chem.* 1996 **271** 15034; 2) H.S. Scott *et al. Genomics* 1998 **15** 330; 3) J. Tang *et al. J. Biol. Chem.* 2000 **275** 7723; 4) N. Cheung *et al. Nat. Cell Biol.* 2007 **9** 1208; 5) M. Le Romancer *et al. Mol. Cell* 2008 **31** 212; 6) X. Chen *et al. Basic Res. Cardiol.* 2006 **101** 346; 7) Q. Sun *et al. J. Immunol* 2012 **188** 3506; 8) T.B. Nicholson *et al. Pharmacol. Res.* 2009 **60** 466; 9) O. Obianyo *et al. ACS Chem. Biol.* 2011 **6** 1127; 10) M.B. Dillon *et al. ACS Chem. Biol.* 2012 **7** 1198



**Coomassie blue stained SDS-PAGE (4-12% acrylamide) of 4  $\mu$ g of RBC PRMT1.** MW markers (left) are, from top, 220, 160, 120, 100, 90, 80, 70, 60, 50, 40, 30, 25, 20, 15, 10 kDa.



**Methyltransferase Activity of PRMT1.** Methylation determined as TCA-precipitable counts in a scintillation/filter plate assay. Reactions were 60 min., 30°C, with 1  $\mu$ M [<sup>3</sup>H]-SAM and protein substrates as indicated.

This product is not intended for therapeutic or diagnostic use in animals or in humans.