

Histone H3	Histone methyltransferases		Substrate	Function	Histone demethylases		Substrate	Function
Arg2	CARM1/PRMT4		a-di-	Transcriptional activation.				
	PRMT6		a-di-	Transcriptional repression	JMJD6		di-	Cellular differentiation and proliferation during development.
Lys4	MLL1/HRX/ALL1	KMT2A		Transcriptional activation. Control of Hox gene.	JARID1A/RBP2	KDM5A	di-,tri-	Transcriptional repression. Rb-interacting protein.
	MLL2/HRX2	KMT2B	tri-	Transcriptional activation. Control of Hox gene.	JARID1B/PLU1	KDM5B	mono-,di-,tri-	Transcriptional repression.
	MLL3	KMT2C		Transcriptional activation.	JARID1C/SMCX	KDM5C	di-,tri-	Transcriptional repression. X-linked mental retardation.
	MLL4/ALR	KMT2D		Transcriptional activation.	JARID1D/SMCY	KDM5D	di-,tri-	Transcriptional repression. Male specific antigen.
	MLL5	KMT2E		Transcriptional activation. Cell cycle arrest.	LSD1/BHC110	KDM1	mono-,di-	Transcriptional repression.
	SET1A	KMT2F	mono-,di-,tri-	Transcriptional activation.	JHDM1B/FBXL10	KDM2B	tri-,	Transcriptional repression. Repression of rRNA genes.
	SET1B	KMT2G	tri-	Transcriptional activation.				
	ASH1/ASH1L	KMT2H	tri-	Transcriptional activation.				
	SET7/9	KMT7	mono-					
	SMYD3			Transcriptional activation.				
Arg8	PRMT5/SKB1		s-di-	Transcriptional repression.				
Lys9	SUV39H1	KMT1A	di-,tri-	Transcriptional repression. Heterochromatic silencing.	JMJD2A/JHDM3A	KDM4A	di-,tri-	Transcriptional repression. Genome integrity.
	SUV39H2	KMT1B	di-,tri-	Transcriptional silencing during meiosis.	JMJD2B	KDM4B	di-,tri-	Heterochromatin formation.
	G9a	KMT1C	mono-,di-	Transcriptional repression in euchromatin.	JMJD2C/GASC1	KDM4C	di-,tri-	Reduced heterochromatin in vivo. Putative oncogene.
	EuHMTase/GLP	KMT1D		Transcriptional repression in euchromatin.	JMJD2D	KDM4D	di-,tri-	
	SETDB1/ESET	KMT1E	tri-	Transcriptional repression in euchromatin.	JMJD1A/JHDM2A	KDM3A	mono-,di-	Transcriptional activation and repression.
	SETDB2/CLL8	KMT1F			JMJD1B/JHDM2B	KDM3B		
	RIZ1/PRDM2	KMT8		Transcriptional repression.	LSD1/BHC110	KDM1	mono-,di-	Transcriptional activation.
Arg17	CARM1/PRMT4		a-di-	Transcriptional activation.				
Arg26	CARM1/PRMT4		a-di-	Transcriptional activation.				
Lys27	EZH2	KMT6	tri-	Initiation of gene silencing.	UTX	KDM6A	tri-	Transcriptional activation. Essential for proper development.
					JMJD3	KDM6B	tri-	Transcriptional activation. Essential for proper development.
Lys36	SET2	KMT3A	tri-	Associate with 3' end of transcribed genes.	JHDM1A/FBXL11	KDM2A	mono-,di-,	
	NSD1	KMT3B			JHDM1B/FBXL10	KDM2B	mono-,di-	
	SMYD2	KMT3C			JMJD2A/JHDM3A	KDM4A	di-,tri-	Transcriptional repression. Genome integrity.
	ASH1	KMT2H	mono-,di-		JMJD2B	KDM4B	di-,tri-	
					JMJD2C/GASC1	KDM4C	di-,tri-	Reduced heterochromatin in vivo. Putative oncogene.
Lys79	DOT1L	KMT4	di-,tri-	Regulated during the cell cycle. Telomere silencing.				

Histone H4	Histone methyltransferases		Substrate	Function	Histone demethylases		Substrate	Function
Arg3	PRMT1		a-di-	Transcriptional activation. Heterochromatic silencing.	JMJD6		di-	Cellular differentiation and proliferation during development.
	PRMT5/SKB1		s-di-	Transcriptional repression (?).				
Lys20	SUV420H1	KMT5B	di-(?),tri-	Transcriptional repression. Heterochromatic silencing.				
	SUV420H2	KMT5C	di-(?),tri-	Transcriptional repression. Heterochromatic silencing.				
	PR-SET7/SET8	KMT5A	mono-	Cell-cycle-dependent transcriptional silencing.				