Site-Specific Methylation

Enzyme	Recognition Sequence	Sites cut	Sites not cut
Aat I	AGGCCT	?	AGGm5CCT AGGCm5CT AGGCm4CT
Aat II	GACGTC	?	GACGTm5C GAm5CGTC
Acc I	GTMKAC	?	GTMKm6AC# GTMKAm5C
Acc II	CGCG	?	m5CGCG
Acc III	TCCGGA	Tm5CCGGA TCm5CGGA	TCCGGm6A
Afl III	ACRYGT	?	Am5CRYGT
Age I	ACCGGT	?	Am5CCGGT ACm5CGGT
Aha II	GRCGYCb	?	GRm5CGYC GRCGYm5C
Alu I	AGCT	?	m6AGCT AGm4CT AGm5CT# AGhm5CT
Alw I	GGATC	?	GGm6ATC GGATm4C
Aos II	GRCGYC	?	GRm5CGYC
Apa I	GGGCCC	?	GGGm5CCC# GGGCCm5C
ApaL I	GTGCAC	GTGCm6AC	GTGCAm5C
Apy I	CCWGG	Cm5CWGGb	m5CCWGG
Ase I	ATTAAT	ATTm6AAT	?
Asp700 I	GAAN4TTC	GAm6AN4TTC GAAN4TTm5C	Gm6AAN4TTC
Asp718 I	GGTACC	GGTm6Am5CCb GGTAm5Cm5Cb	GGTACm5C
Asu II	TTCGAA	TTm5CGAA	?
Ava I	CYCGRG	Cm5CCGGG	m5CYCGRG CYm5CGRG CTCGm6AGb
Avi II	AGCGCT	m6AGCGCT	AGm5CGCT
Bal I	TGGCCA	?	TGGm5CCA# TGGCm5CAb
BamH I	GGATCC	GGATCm5C GGm6ATCC GGm6ATCm5C GGATCm4C	GGATm4CC# GGATm5CC GGAThm5Chm5C
Ban I	GGYRCCb	GGm5CGCC GGYRCm4C	?
Ban II	GRGCYC	GRGCYm5C	GRGm5CYC
Ban III	ATCGAT	?	ATCGm6AT
Bbi II	GRCGYC	?	GRm5CGYC
BbrP I	CACGTG	?	m5CAm5CGTG
Bbs I	GAAGAC	GAAGAm5C	?
Bbu I	GCATGC	GCATGm5C	GCm6ATGC
Bbv I	GCWGC	?	Gm5CWGC#
Bcl I	TGATCAb	TGATm5CA	TGm6ATCA TGAThm5CA
Bcn I	CCSGG	m5CCSGG	Cm4CSGG#
Bfr I	CTTAAG	?	m5CTTAAG GCCN5GGm5Cb GCm4CN5GGCb
Bgl II	AGATCT[b]	AGm6ATCT	AGATm5CT AGAT[h]m5CT
Bna I	GGATCC	GGm6ATCC	GGATm4CC GGATm5CC#
Bsa I	GGTCTC	?	GGTCTm5C
BsaA I	YACGTR	?	YAm5CGTR
BsaB I	GATN4ATC	?	GATN4ATm5C
Bsm I	GAATGC	GAATGm5C	Gm6AATGC
BsmA I	GTCTC	?	GTCTm5C
Bsp106 I	ATCGAT	?	ATCGm5AT#
BgI I	GCCN5GGC	GCm5CN5GGCb	Gm5CCN5GGC
Bsp1286 I	GDGCHC	GDGCHm5C	GDGm5CHC
BspH I	TCATGA	?	TCm6ATGA TCATGm6A
BspM I	ACCTGC	ACCTGm5C	?
BspM II	TCCGGA	TCCGGm6A	Tm5CCGGA TCm5CGGA
BssH II	GCGCGCb	?	Gm5CGCGC
Bst I	GGATCC	GGm6ATCC GGATCm5C	GGATm4CC GGATm5CC GGATCm4C
BstB I	TTCGAA	?	TTCGm6AA TTm5CGAA
BstE II	GGTNACC	GGTNAm5Cm5Cb	GGTNAhm5Chm5C GGTNACm4C
BstN I	CCWGGb	m5CCWGGb Cm5CWGG Cm4CWGG m5Cm5CWGGb	hm5Chm5CWGG
BstU I	CGCG	?	m5CGCG
BstX I	CCAN6TGG	?	m5CCAN6TGG
BstY I	RGATCY	RGm4ATCY RGATm5CY	RGATm4CY
BsuE I	CGCG	?	m5CGCG
BsuF I	CCGG	?	m5CCGG#
BsuM I	CTCGAG	?	CTm5CGAG#
BsuQ I	CCGG	?	mCCGG
BsuR I	GGCC	?	GGm5CC#b
Ccr I	CTCGAG	?	CTCGm6AG
Cfo I	GCGC	?	Gm5CGC Ghm5CGhm5C
Cfr I	YGGCCR	?	YGGm5CCR#
Cfr6 I	CAGCTG	?	CAGm4CTG# CAGm5CTG
Cfr9 I	CCCGGGb	Cm5CCGGG CCm5CGGG	m4CCCGGG m5CCCGGG Cm4CCGGG# CCm4CGGG
Cfr10 I	RCCGGY	?	Rm5CCGGY# RCm5CGGY
Cfr13 I	GGNCC	?	GGNm5CC#
Cla I	ATCGAT	?	m6ATCGAT ATm5CGAT ATCGm6AT#
Cpe I	TGATCA	?	TGm6ATCA
Csp I	CGGWCCG	CGGWCm5CG	CGGWm5CCG m5CGGWCCG
Csp45 I	TTCGAA	?	TTCGm6AA
CviJ I	RGCY	?	RGm5CY#
CviP I	CC	Cm5C	m5CC#
Dde I	CTNAG	?	m5CTNAG# hm5CTNAG
Dpn I	Gm6ATCb	Gm6ATC Gm6ATm5Cb Gm6ATm4C	GATC GATm4C GATm5C
Dpn II	GATC	?	Gm6ATC#
Dra I	TTTAAA	TTTAm6AA	?
Dra II	RGGNCCY	?	RGGNCm5CY
Eae I	YGGCCR	?	YGGm5CCR# YGGCm5CR
Eag I	CGGCCG	?	CGGm5CCG m5CGGCm5CG

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^{m5}C = C5-methylcytosine
^{hm5}C = hydroxymethylcytosine

^{m}C = methylcytosine
N_4 or C_5-methylcytosine unspecified
^{m6}A = N_6-methyladenine
Sequences are in 5′ - 3′ order.

Site-Specific Methylation, continued

Enzyme	Recognition Sequence	Sites cut	Sites not cut
Ear I	GAAGAG	?	Gm6AAGAG GAAGm6AG m5CTm5CTTm5C
EclX I	CGGCCG	?	m5CGGCm5CG CGGm5CCG
Eco47 I	GGWCC	?	GGWCm5C
Eco47 III	AGCGCT	m6AGCGCT	AGm5CGCT
EcoA	GAGN7GTCAb	?	Gm6AGN7GmTCA#b
EcoB	TGAN8TGCTb	?	TGm6AN8mTGCT#b
EcoD XXI	TCAN7AATCb	?	TCAN7m6AAmTC#b
EcoE	GAGN7ATGC	?	Gm6AGN7ATGC
EcoK	AACN6GTGCb	?	Am6ACN6GmTGC#b
Eco0109 I	RGGNCCY	?	RGGNCm5CY
EcoR I	GAATTC	GAATThm5C	Gm6AATTCb GAm6ATTC# GAATTm5Cb
EcoR II	CCWGG	m5CCWGGb	m4CCWGG Cm4CWGG Cm5CWGG# CCm6AGG hm5Chm5CWGG
EcoR II	GAATTC	GAATThm5C	Gm6AATTCb GAm6ATTC# GAATTm5Cb
EcoR V	GATATC	GATATm5Cb	Gm6ATATC# GATm6ATC
EcoR 124	GAAN6RTCGb	?	GAm6AN6RTCG GAAN6RmTCG
EcoR 124/3	GAAN7RTCGb	?	m6A
Ehe I	GGCGCC	?	GGm5CGCC
Esp I	GCTNAGC	GCTNAGm5C	Gm5CTNAGC
Fnu4H I	GCNGC	?	Gm5CNGC GCNGm5C
FnuD II	CGCG	?	m5CGCG CGm5CG
Fok I	CATCC	CATm5CC CATCm5Cb	GGm6ATG Cm6ATCC CATCm4C
Fse I	GGCCGGCC	?	GGm5CCGGm5CC GGCm5CGGCC GGm5CCGGCC
Fsp I	TGCGCA	?	TGm5CGCA
Hae II	RGCGCYb	?	RGm5CGCY RGhm5CGhm5CY
Hae III	GGCC	GGCm5C	GGm5CC#b GGhm5Chm5C
Hap II	CCGG	?	Cm5CGG#
Hga I	GACGC	?	GAm5CGC GACGm5C
HgiA I	GRGCYC	GRGCYm5C	GRGm5CYC
HgiC I	GGYRCC	?	GGYRCm5C
HgiC II	GGWCC	?	GGWCm5C
HgiE I	GGWCC	?	GGWCm5C
HgiJ II	GGYRCC	?	GGYRCm5C
Hha I	GCGC	?	Gm5CGC# GCGm5C Ghm5CGhm5C
Hha II	GANTC	?	Gm6ANTC#
Hinc II	GTYRAC	GTYRAm5C	GTYRm6AC GTYRAhm5C
Hind II	GTYRAC	?	GTYRm6AC#
Hind III	AAGCTT	Am6AGCTT#	m6AAGCTT# AAGm5CTT AAGhm5CTT
Hinf I	GANTC	GANTm5Cb	Gm6ANTC GANThm5C
HinP I	GCGC	?	Gm5CGC
Hpa I	GTTAAC	GTTAAm5C	GTTAm6AC# GTTAAhm5C
Hpa II	CCGG	?	m4CCGG m5CCGGb Cm4CGGb Cm5CGG# hm5Chm5CGG
Hph I	TCACC	TCACm5C	Tm5CACC# GGTGm6A
Kpn I	GGTACCb	GGTAm5CC GGTACm5C GGTAm5Cm5Cb GGTm6ACC	GGTm6Am5CC GGTACm4C
Kpn2 I	TCCGGA	TCCGGm6A	Tm5CCGGA TCm5CGGA
Ksp I	CCGCGG	?	m5CCGCGG Cm5CGCGG
Mae II	ACGT	?	Am5CGTb
Mam I	GATN4ATC	?	Gm6ATN4m6ATC
Mbo I	GATCb	GATm4C GATm5Cb	Gm6ATC# GAThm5C
Mbo II	GAAGA	Tm5CTTm5Cb Gm6AAGA	GAAGm6A#
Mfl I	RGATCYb	?	RGm6ATCY RGATm4CY RGATm5CY
Mlu I	ACGCGT	m6ACGCGT	Am5CGCGT
Mme II	GATC	?	Gm6ATC
Mnl I	CCTCb	?	m5CCTC m5Cm5CTm5C
Mro I	TCCGGA	TCCGGm6A	Tm5CCGGA TCm5CGGA
Mse I	TTAA	TTm6AA	?
Msp I	CCGGb	m4CCGG Cm4CGG Cm5CGG	m5CCGG# hm5Chm5CGG
Mst II	CCTNAGG	m5CCTNAGG	?
Mun I	CAATTG	?	CAm6ATTG
Mva I	CCWGG	Cm5CWGGb m5CCWGG	Cm4CWGG# CCm6AGGb m4CCWGGb m5Cm5CWGGb
Mvn I	CGCG	?	m5CGCG
Nae I	GCCGGCb	?	Gm5CCGGC GCm5CGGC GCCGGm5C
Nar I	GGCGCC	GGCGCm5C	GGm5CGCC GGCGCm4C
Nci I	CCSGG	m5CCSGG	Cm4CSGG Cm5CSGGb
Nco I	CCATGG	CCm6ATGG	m4CCATGGb m5CCATGG
Nde I	CATATG	m5CATATGb	m6A
Nde II	GATC	GATm5Cb	Gm6ATC
Nhe I	GCTAGC	?	GCTAGm5C
Nla III	CATG	?	Cm6ATG#

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Sequences are in 5′ - 3′ order.

Site-Specific Methylation, continued

Enzyme	Recognition Sequence	Sites cut	Sites not cut
Not I	GCGGCCGC	GCGGCCGm5C	GCGGm5CCGC GCGGCm5CGC
Nru I	TCGCGA	TCGm5CGA	Tm5CGCGA TCGCGm6A
Nsi I	ATGCAT	?	ATGCm6AT ATGm5CAT
Nsp I	RCATGY	?	RCm6ATGY
NspB II	CMGCKG	Cm5CGCKG	?
PflM I	CCAN5TGG	?	Cm4CAN5TGG Cm5CAN5TGG
Pfu I	CGTACG	?	CGTAm5CG
PaeR7 I	CTCGAG	?	CTCGm6AG# CTm5CGAG
Pml I	CACGTG	?	CAm5CGTG
PpuAI	CGTACG	?	CGTAm5CG
PspA I	CCCGGG	Cm5CCGGG CCm5CGGG	m5CCCGGG
Pst I	CTGCAG	?	m5CTGCAG CTGCm6AG#
Pvu I	CGATCGb	CGm6ATCG	CGATm4CG CGATm5CG
Pvu II	CAGCTG	?	CAGm4CTG# CAGm5CTG
Rsa I	GTACb	GTAm5Cb	GTm6AC
Rsr I	GAATTC	?	Gm6AATTC GAm6ATTC#b
Rsr II	CGGWCCG	?	m5CGGWCCG CGGWm5CCG CGGWCm5CG
Sac I	GAGCTC	Gm6AGCTC	GAGm5CTC
Sac II	CCGCGG	?	m5CCGCGG
Sal I	GTCGAC	GTCGAm5C	GTm5CGAC GTCGm6AC#
Sau3A I	GATCb	Gm6ATC	GATm5C#b GATm4C GAThm5C
Sau96 I	GGNCC	?	GGNm5CC# GGNCm5C GGNhm5Chm5C
Sca I	AGTACT	AGTAm5CT	?
ScrF I	CCNGG	m5CCNGG	Cm5CNGG Cm4CNGG
SfaN I	GATGC	GATGm5C	Gm6ATGC
Sfi I	GGCCN5GGCC	GGm5CCN5GGm5CCb GGCCN5GGCm5C	CGGCm5CN5GGCC
Sfl I	CTGCAG	?	CTGCm6AG
SgrA I	CRCCGGYG	?	CRCm5CGGYG
Sin I	GGWCC	?	GGWm5CC#
Sma I	CCCGGG	Cm5CCGGG	m4CCCGGG m5CCCGGGb Cm4CCGGGb CCm4CGGG CCm5CGGGb
SnaB I	TACGTA	?	TAm5CGTA Tm6ACGTm6A
Sno I	GTGCAC	?	GTGm5CAm5C
Spe I	ACTAGT	?	m6ACTAGT Am5CTAGT
Sph I	GCATGC	GCATGm5C Ghm5CATGhm5C	GCm6ATGC
Spl I	CGTACG	CGTm6ACG	?
Spo I	TCGCGA	TCGCGm6A	Tm5CGCGA TCGm5CGA
Srf I	GCCC/GGGC	GCCC/GGGm5C	Gm5CCC/GGGC GCm5CC/GGGC GCCm5C/GGGC
Ssp I	AATATT	m6AATATT	?
Sst I	GAGCTC	?	GAGm5CTC GAGhm5CThm5C
Stu I	AGGCCT	?	AGGm5CCT AGGCm5CT AGGCm4CT
StySP I	AACN6GTRCb	?	Am6ACN6GmTRC#b
Taq I	TCGA	Tm5CGAb Thm5CGAb	TCGm6A#
Taq II	GACCGA CACCCA	?	
Tfi I	GAWTC	GAWTm5C	?
Tha I	CGCG	m5CGCG	m5CGCG hm5CGhm5CG
Xba I	TCTAGA	?	TCTAGm6A# Tm5CTAGA Thm5CTAGA
Xho I	CTCGAGb	?	CTm5CGAG CTCGm6AG m5CTCGAG
Xho II	RGATCY	RGm6ATCY	RGATm5CYb
Xma I	CCCGGG	CCm5CGGGb	m4CCCGGG m5CCCGGG Cm4CCGGG CCm4CGGG
Xma III	CGGCCG	?	CGGm5CCG
Xmn I	GAAN4TTC	GAm6AN4TTC	Gm6AAN4TTC GAAN4TTm5Cb
Xor II	CGATCG	CGm6ATCG	CGATm5CG hm5CGAThm5CG

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REFERENCE

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3. Cornish-Bowden, A. (1985) *Nucleic Acids Res.* 13: 3021-3030