A

BSMAP:

```
SRX759486_run1.32619849     0     chr1     149718767   255     31M     *     0     0     CGGCGGGGAGAAGTCGCGCGGAGAGGATTAGG
?==DDDDD?FFB0?8@6;5@66>?CBBBB@B     NM:i:0     ZS:Z:++
SRX759486_run2.34554911     0     chr1     149718767   255     36M     *     0     0     TGGTGGGAGAAGTTGTGTGGAGAGGATTAGGTGTTG
:=?4=:;;DCDDDE9:<+A;+C9ECC9?13?:?DD?     NM:i:0     ZS:Z:++
SRX759486_run1.35560695     0     chr1     149718767   255     36M     *     0     0     TGGTGGGAGAAGTTGTGTGGAGAGGATTAGGTGTTG
=@@+ADAD?@FDDEFH?GGG>G@FGIIIEFGHBFGH     NM:i:0     ZS:Z:++
SRX759486_run2.35069929     0     chr1     149718767   255     31M     *     0     0     CGGCGGGGAGAAGTCGCGCGGAGAGGATTAGG
?:=DDDDD?DF?9B?F;@5A<?>?C?A>@;B     NM:i:0     ZS:Z:++
SRX759486_run3.34251436     0     chr1     149718767   255     36M     *     0     0     CGGTGGGAGAAGTCGTGCGGAGAGGATTAGGTGTTG
==?BB1@BFADACGGGGHIHGGIGEEHGHCIBDFH@     NM:i:0     ZS:Z:++
SRX759486_run1.2364419     0     chr1     149718767   255     20M     *     0     0     CGGCGGGGAGAAGTCGCGCGG
???DDDDDD:;?9?)76@@A     NM:i:0     ZS:Z:++
SRX759486_run3.34896416     0     chr1     149718767   255     36M     *     0     0     CGGCGGGGAGAAGTTGTGCGGAGAGGATTAGGGGTTG
=::BDDDDDDFH)0?B?FB7:;;@CECEHFE;(9=A6     NM:i:1     ZS:Z:++
SRX759486_run3.35980782     0     chr1     149718767   255     36M     *     0     0     TGGTGGGAGAAGTTGTGTGGAGAGGATTAGGTGTTG
=>=AA=??<8<+<A7C+A7+++2155=?BAB4?<?B     NM:i:0     ZS:Z:++
```

B

BISMARK:

```
SRX759486_run2.34554911_34554911_length=36     0     chr1     149718767   38     36M     *     0     0     TGGTGGGAGAAGTTGTGTGGAGAGGATTAGGT-
GTTG :=?4=:;;DCDDDE9:<+A;+C9ECC9?13?:?DD?     NM:i:9     MD:Z:0C2C8C0C1C1C8C0C5C2     XM:Z:z..z.....xz.z.z.....hx.....x..     XR:Z:CT     XG:Z:CT     RG:Z:SRX759486
SRX759486_run2.35069929_35069929_length=36     0     chr1     149718767   38     36M     *     0     0     CGGCGGGAGAAGTCGCGCGGAGAGGATTAGGT-
GTTG ?:=DDDDD?DF?9B?F;@5A<?>?C?A>@;B#####     NM:i:4     MD:Z:12C13C0C5C2     XM:Z:Z..Z.....xZ.Z.Z.....hx.....x..     XR:Z:CT     XG:Z:CT     RG:Z:SRX759486
SRX759486_run1.2364419_2364419_length=36     0     chr1     149718767   38     36M     *     0     0     CGGCGGGAGAAGTCGCGCGGAGAGGATTAGGT-
GTTG ???DDDDDD:;?9?)76@@A################     NM:i:4     MD:Z:12C13C0C5C2     XM:Z:Z..Z.....xZ.Z.Z.....hx.....x..     XR:Z:CT     XG:Z:CT     RG:Z:SRX759486
SRX759486_run1.32619849_32619849_length=36     0     chr1     149718767   0     36M     *     0     0     CGGCGGGAGAAGTCGCGCGGAGAGGATTAGGG-
GTTG ?==DDDDD?FFB0?8@6;5@66>?CBBBB@B#####     NM:i:5     MD:Z:12C13C0C3T1C2     XM:Z:Z..Z.....xZ.Z.Z.....hx.....x..     XR:Z:CT     XG:Z:CT     RG:Z:SRX759486
SRX759486_run1.35560695_35560695_length=36     0     chr1     149718767   38     36M     *     0     0     TGGTGGGAGAAGTTGTGTGGAGAGGATTAGGT-
GTTG =@@+ADAD?@FDDEFH?GGG>G@FGIIIEFGHBFGH     NM:i:9     MD:Z:0C2C8C0C1C1C8C0C5C2     XM:Z:z..z.....xz.z.z.....hx.....x..     XR:Z:CT     XG:Z:CT     RG:Z:SRX759486
SRX759486_run3.34251436_34251436_length=36     0     chr1     149718767   38     36M     *     0     0     CGGTGGGAGAAGTCGTGCGGAGAGGATTAGGT-
GTTG ==?BB1@BFADACGGGGHIHGGIGEEHGHCIBDFH@     NM:i:6     MD:Z:3C8C2C10C0C5C2     XM:Z:Z..z.....xZ.z.Z.....hx.....x..     XR:Z:CT     XG:Z:CT     RG:Z:SRX759486
SRX759486_run3.34896416_34896416_length=36     0     chr1     149718767   0     36M     *     0     0     CGGCGGGAGAAGTTGTGCGGAGAGGATTAGGG-
GTTG =::BDDDDDDFH)0?B?FB7:;;@CECEHFE;(9=A6     NM:i:7     MD:Z:12C0C1C10C0C3T1C2     XM:Z:Z..Z.....xz.z.Z.....hx.....x..     XR:Z:CT     XG:Z:CT     RG:Z:SRX759486
SRX759486_run3.35980782_35980782_length=36     0     chr1     149718767   38     36M     *     0     0     TGGTGGGAGAAGTTGTGTGGAGAGGATTAGGT-
GTTG =>=AA=??<8<+<A7C+A7+++2155=?BAB4?<?B     NM:i:9     MD:Z:0C2C8C0C1C1C8C0C5C2     XM:Z:z..z.....xz.z.z.....hx.....x..     XR:Z:CT     XG:Z:CT     RG:Z:SRX759486
```

XM Tag
h unmethylated C in CHH context
H methylated C in CHH context
x unmethylated C in CHG context
X methylated C in CHG context
z unmethylated C in CpG context
Z methylated C in CpG context

C

mHap
before aggregation
(Information reduction)

chr1	149718767	149718784	00000	1	+
chr1	149718767	149718784	00000	1	+
chr1	149718767	149718784	00000	1	+
chr1	149718767	149718784	10101	1	+
chr1	149718767	149718784	11001	1	+
chr1	149718767	149718784	11111	1	+
chr1	149718767	149718784	11111	1	+
chr1	149718767	149718784	11111	1	+

D

mHap

chr1	149718767	149718784	00000	3	+
chr1	149718767	149718784	10101	1	+
chr1	149718767	149718784	11001	1	+
chr1	149718767	149718784	11111	3	+