

Table S1. Parameters of Bowtie2/Bowtie1 based alignment

Alignment method	Reference anchoring preparation	Reads anchoring preparation	Alignment
bt2 no anchor ref no padding	No reference anchoring	No reads anchoring	bowtie2 --norc -N 1 -L 16 -i S,0,0.2 -f
bt2 no anchor	-l NNNNNNNNNN -r NNNNNNNNNN	No reads anchoring	bowtie2 --norc -N 1 -L 16 -i S,0,0.2 -f
bt2 no anchor --np 0	-l NNNNNNNNNN -r NNNNNNNNNN	No reads anchoring	bowtie2 --norc -N 1 -L 16 -i S,0,0.2 -f --np 0
bt1 no anchor	-l NNNNNNNNNN -r NNNNNNNNNN	No reads anchoring	bowtie --norc -v 2
bt2 CG anchor 6nt	-l CCCCCCCCCC -r GGGGGGGGGG	-l CCCCCC -r GGGGGG	bowtie2 --norc -N 1 -L 16 -i S,0,0.2 -f
bt2 CG anchor 5nt /bt2 CG anchor	-l CCCCCCCCCC -r GGGGGGGGGG	-l CCCCC -r GGGGG	bowtie2 --norc -N 1 -L 16 -i S,0,0.2 -f
bt2 CG anchor 4nt	-l CCCCCCCCCC -r GGGGGGGGGG	-l CCCC -r GGGG	bowtie2 --norc -N 1 -L 16 -i S,0,0.2 -f
bt2 CG anchor 3nt	-l CCCCCCCCCC -r GGGGGGGGGG	-l CCC -r GGG	bowtie2 --norc -N 1 -L 16 -i S,0,0.2 -f
bt2 CG anchor 2nt	-l CCCCCCCCCC -r GGGGGGGGGG	-l CC -r GG	bowtie2 --norc -N 1 -L 16 -i S,0,0.2 -f
bt2 CG anchor 1nt	-l CCCCCCCCCC -r GGGGGGGGGG	-l C -r G	bowtie2 --norc -N 1 -L 16 -i S,0,0.2 -f
bt1 CG anchor 6nt	-l CCCCCCCCCC -r GGGGGGGGGG	-l CCCCCC -r GGGGGG	bowtie --norc -v 2
bt1 CG anchor 5nt /bt1 CG anchor	-l CCCCCCCCCC -r GGGGGGGGGG	-l CCCCC -r GGGGG	bowtie --norc -v 2
bt1 CG anchor 4nt	-l CCCCCCCCCC -r GGGGGGGGGG	-l CCCC -r GGGG	bowtie --norc -v 2
bt1 CG anchor 3nt	-l CCCCCCCCCC -r GGGGGGGGGG	-l CCC -r GGG	bowtie --norc -v 2
bt1 CG anchor 2nt	-l CCCCCCCCCC -r GGGGGGGGGG	-l CC -r GG	bowtie --norc -v 2
bt1 CG anchor 1nt	-l CCCCCCCCCC -r GGGGGGGGGG	-l C -r G	bowtie --norc -v 2

Summary of reads anchoring, reference anchoring and alignment parameters used in Bowtie2 (bt2) and Bowtie1 (bt1) based alignments. In the reads and reference anchoring section, -l/-r means anchor sequence to the 5'/3' of reads/reference fasta sequence. bowtie2-build or bowtie-build was used with default parameter to build bowtie2/bowtie1 index after reference anchoring preparation.