

Extended data table 1: **Oligonucleotides and Primers**

Name	Sequence
<i>Atrx crRNA</i>	GAATGGCCGTAAAAGTTCTG
<i>Blm crRNA</i>	TTACCTGGAACATTTCAACG
<i>Fancd2 crRNA</i>	TGGGAAGCCTGAATTCGTGA
<i>RnaseH1 crRNA</i>	AGCAGGAAACCGGTCCACCT
<i>cd4 crRNA</i>	TATCACGGCCTATAAGAGTG
HTGTS	
<i>Sp Bio Bait</i>	5BiosG-TAGTAAGCGAGGCTCTAAAAAGCA
<i>Sp Nested Primer</i>	ACACTCTTTCCCTACACGACGCTCTCCGATCTGGTAAGCAAAGCTGGGCTTG
<i>Bridge Adaptor Upper</i>	GCGACTATAGGGCACGCGTGGNNNNN-NH2
<i>Bridge Adaptor Lower</i>	5Phospho-CCACGCGTGCCTATAGTCGC-NH2
<i>Universal I7</i>	GACTGGAGTTCAGACGTGTGCTCTTCCGATCTGACTATAGGGCACGCGTGG
G4 Oligonucleotides	
<i>Kit1</i>	AAGGGAGGGCGCTGGGAGGAGGGAT
<i>Kit2</i>	AACGGGCGGGCGCGAGGGAGGGGAT
<i>Spb1</i>	AAGGCGAGGAGGGGCGTGGCCGGCAT
<i>Telo</i>	AATTAGGGTTAGGGTTAGGGTTAGGGAT
<i>Kit1 control</i>	AAGCAAGCACGCTGCAAGGAGGGAT
<i>Kit2 control</i>	AACGCACGGGCGCGAGCAAGCAGAT
<i>Spb1 control</i>	AAGGCGACAAGGCACGTGGCCACAT
<i>Telo control</i>	AATTAGCATTAGCATTAGCATTAGGGAT
Oligos for G4 detection	
<i>Complementary ssDNA</i>	ATGTATCTACTCGCAGTATCATAAC3BiosG
<i>Kit1</i>	GATACTGCGAGTAGATACATGAAGGGAGGGCGCTGGGAGGAGGGATCT
<i>Kit2</i>	GATACTGCGAGTAGATACATGAACGGGCGGGCGCGAGGGAGGGGATCT
<i>Spb1</i>	GATACTGCGAGTAGATACATGAAGGCGAGGAGGGGCGTGGCCGGCATCT
<i>G-default</i>	GATACTGCGAGTAGATACATGAATGGGCAGGGCAGGGTGGGATCT
<i>Kit1 control</i>	GATACTGCGAGTAGATACATGAAG CAAGCACGCTGCAAGGAGCAATCT
<i>Kit2 control</i>	GATACTGCGAGTAGATACATGAACG CACGCACGCGAGCAAGCAGATCT
<i>Spb1 control</i>	GATACTGCGAGTAGATACATGAAGGCGA CAAGGCACGTGGCCACATCT
<i>G-default control</i>	GATACTGCGAGTAGATACATGAATG CACAGCACAGCATGCAATCT
qRT-PCR Primers	
<i>mTet3-F</i>	CGAGTTCCCTACCTGCGATT
<i>mTet3-R</i>	TCCTCCATGAGTTCCCGGAT
<i>mu germline-F</i>	CTCGGTGGCTTTGAAGGAAC
<i>mu germline-R</i>	TGGTGCTGGGCAGGAAGT
<i>g1 germline-F</i>	TCGAGAAGCCTGAGGAATGTG
<i>g1 germline-R</i>	ATGGAGTTAGTTTGGGCAGCA
<i>IRF4-F</i>	CAATGTCCTGTGACGTTTGG
<i>IRF4-R</i>	GGCTTCAGCAGACCTTATGC
<i>c-myc-F</i>	TCTCCACTCACCAGCACAACTACG
<i>c-myc-R</i>	ATCTGCTTCAGGACCCT