

Supplementary Figure 1. Sequence alignments of KZ.Fortune (Query) and KZ.Ushkonyr (Sbjct) gRNAs

Range 2: 1 to 1939

| Score | Expect | Identities | Gaps | Strand |
|------------------|---|-----------------|-------------|-----------|
| 1873 bits (2076) | 0.0 | 1580/1940 (81%) | 2/1940 (0%) | Plus/Plus |
| Query 1 | TAATTTGACTTAAACAACGCGACAGTTCAAGCAAATTACTTAAATGGCACTTACTTACA | 60 | | |
| Sbjct 1 | TAATTTGACTTAAACAACGCGACAGTTCAAGCAAATTACTTAAATGGCACTTACTTACA | 60 | | |
| Query 61 | GAAGTCCAATCGAGGAAGTGTAACTACTAGAGCCTAATGCTCAATCYCTTATTTCCA | 120 | | |
| Sbjct 61 | GAAGTCCAATCGAGGAAGTGTAACTACTAGAGCCTAATGCTCAATCTCTGATCTCCA | 120 | | |
| Query 121 | ACGTCGCCACCAGCAGCTTTCAAGAGAGTGAGAAGGATAACTTCGCCTGGTTTTGCTACC | 180 | | |
| Sbjct 121 | ACGTTGCCACCAGCAGCTTCAAGAGAGTGAGAAGGATAACTTCGCCTGGTTTTGCTACC | 180 | | |
| Query 181 | ATGTGTCGGCTAGCGCCAAGGAACACCTTAGTAGAGCAGGAATTACCTAAGCCCCTACT | 240 | | |
| Sbjct 181 | ATGTGCCCGCTAACGCCAAGGAACATCTAGCAAAGCCGGAATTACCTAAGCCCATACT | 240 | | |
| Query 241 | CGGGGTATCCTCATTCTCACCCGGTGTGCAAGACATTGGARAATTACCTACTGTACAAAG | 300 | | |
| Sbjct 241 | CAGGGTATCCTCATTCTCACCCGGTGTGCAAAACATTGGAGAATTACCTACTGTACAAAG | 300 | | |
| Query 301 | TCCTACCACCACTTGTAATAACACCTTTTACTTTGTAGGAATAAAGAATTCAAGCTCA | 360 | | |
| Sbjct 301 | TCTTACCACCACTTGTAATAACACCTTTTACTTCGTAGGAATAAAGAATTTAAGTTAA | 360 | | |
| Query 361 | ATTTTCTTAAGAAGAGAATAAAACAAATGAGCATGATTCAAGCTATAAATAGGTATGTGA | 420 | | |
| Sbjct 361 | ATTTCTTAAGAAAAGAATCAAGCAAATGAGCATGATTCAAGCAATAAATAGGTATGTGA | 420 | | |
| Query 421 | GCAGTGGCGATAAATTCGATATGGTAATGAGTTCGTGATCAAATTCGGCGCGGCGTCGC | 480 | | |
| Sbjct 421 | GCAGTGGCGATAAAGTTGAGGTATGGCAATGAGTTTGTATTAAATTCGGCACTGCATCAG | 480 | | |
| Query 481 | CCGAGCTCAAGCGGCACCATGGTTATTCAGTCCAGCCTTGCCTGATCTCTTGCCGA | 540 | | |
| Sbjct 481 | CTGAGCTCAAGCGTCATCATGGTTACTCGCTGGACCCAGCATTGCGCGATCTTTGCCCA | 540 | | |
| Query 541 | ACATAAGAGGGATTCTAATCTCTTCTCCACGATGAGATGCATTATTGGGAAAAGAACC | 600 | | |
| Sbjct 541 | ACATAAGAGGGACTCAAATCTCTTCTCCACGATGAGATGCATTATTGGGAAAAGAATC | 600 | | |
| Query 601 | AGTTGATCCACTTCTTGAACAATGCAGACCAATACATGCTTGTGCACAATTGTGTACC | 660 | | |
| Sbjct 601 | AAGTATCAATTTCTTGAACAATGTCGGCCCAACACGTGCTTATGCACAATTGTGTATC | 660 | | |
| Query 661 | CAACAGAGATATTCGTTGGGGCCGACGTTCTTTGAATCCGTGGGCATATGAGTTTGA | 720 | | |
| Sbjct 661 | CCACTGAGATATTCGTTGGGGCTCGGCATCCTTGAACCATGGGCATATGAGTTTGA | 720 | | |
| Query 721 | TCAAGAGAGATAAACTGCTCTTTTACCAGATGGGGTGCCTAGTGAAGGCTATGAGCAGC | 780 | | |
| Sbjct 721 | TCAAAGGGATAAGCTGCTTTTCTACCAGACGGGGTGCAGCAGGAAGGTTATGAGCAGC | 780 | | |
| Query 781 | CTGTCAACTGTGGGTATCTCCTCCGCACTAGAAAGATATTGCTAAGGGATGGCACTATGT | 840 | | |
| Sbjct 781 | CGGTCAACTGCGGGTATCTGCTCCGCAACAAGGAAGATATTGCTTAGGGACGGTACTGTGT | 840 | | |
| Query 841 | ACAGCGTTGATCTAGTGTGAGCAAATTCGCCCATCATCTAATAGCAATCACCAGGGCG | 900 | | |
| Sbjct 841 | ACAGCGTTGATCTCGTGTGAGCAAATTTCCACCACCTGGTAGCTATCACCAGGGGG | 900 | | |
| Query 901 | ATTTGATCACCCGACTTACCGTAGCTTCGGCCCTTTTGAAGGCGATCAAGAGTGCGGGCT | 960 | | |
| Sbjct 901 | ATTTGATCACCCAGCCTATCGAGTTTGGCCCGTTCGAAGCGATCAAGAGCGCAGGTT | 960 | | |
| Query 961 | TGCAGGGGATAAGCAAAGGTAGGCCGCAATCTATCCTGTACCGTGCCACATGATTTCTC | 1020 | | |
| Sbjct 961 | TGCAAGGGATAAGTAAGGGTAGACCGAAGTTCTACCCGGTACCATGCCACATGATTTCCA | 1020 | | |
| Query 1021 | GTTTATACAGGTACTTACGGTCTTTAAAGAAACCTGATAAGCAGTCTGCAATGGCAAAT | 1080 | | |

Sbjct 1021 GGTGTACAGGTA... 1080
 Query 1081 TCTCGCAGATGT... 1140
 Sbjct 1081 TCTCCAGATGT... 1140
 Query 1141 ATCTGATAATCA... 1200
 Sbjct 1141 ATTTGATCATAA... 1200
 Query 1201 TCTTTGGTAAT... 1260
 Sbjct 1201 TCTTTGGCAAT... 1260
 Query 1261 GTGCTGTAAGT... 1320
 Sbjct 1261 GCGCCGTGAGC... 1320
 Query 1321 TGCAAACCATCT... 1380
 Sbjct 1321 TGCAAATATTT... 1380
 Query 1381 ATCCCCCTGAG... 1440
 Sbjct 1381 AACCACCTGAG... 1440
 Query 1441 TGTGCGACAGG... 1500
 Sbjct 1441 TGAGTGATCGG... 1500
 Query 1501 TGAGCTTTTGG... 1560
 Sbjct 1501 TGAGCTACTGG... 1560
 Query 1561 ACGTGGATAGC... 1620
 Sbjct 1561 ATGTCGACAGC... 1620
 Query 1621 CCCAGATCGCG... 1680
 Sbjct 1621 CTAAGCTTACAT... 1680
 Query 1681 CCGAGTATGCT... 1739
 Sbjct 1681 CAGAGTATGCT... 1739
 Query 1740 GTTGCTGGGGAC... 1799
 Sbjct 1740 GTAATTGGGGAT... 1799
 Query 1800 TTGGACGAGAC... 1859
 Sbjct 1800 TTGGATGAAAC... 1859
 Query 1860 AAGCCCCAAGG... 1919
 Sbjct 1860 AAGCCCCGAGG... 1919
 Query 1920 GTGGGGCACGAT... 1939
 Sbjct 1920 GTGAGTACCCG... 1939

Range 1: 2112 to 8469

| Score | Expect | Identities | Gaps | Strand |
|------------------|--------|-----------------|--------------|-----------|
| 5711 bits (6333) | 0.0 | 5107/6375 (80%) | 36/6375 (0%) | Plus/Plus |

Query 2112 GCGTTCCCCAC... 2169
 Sbjct 2112 GCGTTCCCAAC... 2169
 Query 2170 CATGGTACTGC... 2229
 Sbjct 2170 CTTGGTACTGC... 2229
 Query 2230 GCTGGCCTAGAT... 2289
 Sbjct 2230 GCTGGCCTAGAT... 2289

| | | | |
|-------|------|--|------|
| Sbjct | 2230 | GTTGGCCACATGGTTAAGCAAATGGATGGAGTTACATGACATTGATGAAGCRTACTATG | 2289 |
| Query | 2290 | ATAGCATGCTGGCCAGGAATTCCTGCTGGCGGGGCTCTAGAGTGTGGAGTGGGTGATG | 2349 |
| Sbjct | 2290 | ATAGCATGTTTCGCTCAGGAACCTCCCGCTGGTGGAACCTTAGAGCATGAAGTGAAGCGCAG | 2349 |
| Query | 2350 | GAGGCCAGTTTCATCCCGGGCTCAAATGTGGCCATAGCTGAAGTTGGAGGTGAGTCCCAGG | 2409 |
| Sbjct | 2350 | AGGGCTTGTTCGCCCCGATTTCGCGCATAGCCATAGCCGAGGTAGGAGGTGAATCCCTGG | 2409 |
| Query | 2410 | TTTCAATTGGCTGTG---TGGCAGGAACTGGGCAGTTGTTACTGGAATTGGGGGATTTCA | 2466 |
| Sbjct | 2410 | TTTCGATTGAGTGTGCCTTGG--GGAAGAGAACAAGAATG-CTGAGATTGGGCGAGCTCC | 2466 |
| Query | 2467 | TTGAAGTGCCTGGTCCATGTTGGAGCAAGCACCATCTCCACGTGCACTGCAGCGAAACGC | 2526 |
| Sbjct | 2467 | TTGAAATGCCCGAATTGTGTGCGGAGCTCGCATCGGCTACATATGCATTGCAGCGCATCAA | 2526 |
| Query | 2527 | GCGGGGTGACGTTTATCTTCAGGCAAATTAAGGTTCC---AGGCC-CAGTGGAGAATGC | 2581 |
| Sbjct | 2527 | GTGGAGTCAATTTACATTCAGGCAGATCA--GTTTCGCTAGATTCTGCAGTGGGGATTGA | 2584 |
| Query | 2582 | CGCAGTGGGGCA-AG--TCGCAACGCCTGCCTCAACAGCAGGTGCGGGGAG-GTCCAAGC | 2637 |
| Sbjct | 2585 | TG---TGGGGCAGAGCTTAGCGCCGCC-GCCGC--CTGTAA-TGAGTGAAGCGCCCAAGG | 2637 |
| Query | 2638 | TCAATGAGTATGATGCCACCACACACAGAGGGGGTTCGAGTGCATGCATCCGGCAAGT | 2697 |
| Sbjct | 2638 | CTAACCCGAATGATGTTCAACATACCGGGGAAGGGGTGTGGTGCATGCATCCGGCAAGT | 2697 |
| Query | 2698 | GCCCAGCAGCAAAGAAATTCATAGGGTACCTAATGCAGGTGGTGGAGATTGTTTTGGC | 2757 |
| Sbjct | 2698 | GCCCGAATTCTGAGAAATTTACAGGGTGCCTCAATGCTGGGGGGGTGATTGCTTTTGGT | 2757 |
| Query | 2758 | TGGCCATCTCGCACTTCACAGGAGTGAGCGTCAAGATATGAAGCAGGGATTGCAACAGC | 2817 |
| Sbjct | 2758 | TGGCAATCTCTCACTTCACTGGAGTTAGTGTGCATGATATGAAGCAAGGGTTACAGCAGC | 2817 |
| Query | 2818 | TGGATTGGGAGAGTGTGCGTTCAGCACCCAG-ITAGCCTTGCAATTGAAACCAACAAGCT | 2876 |
| Sbjct | 2818 | TGACTTGGGAAAGTGAAGCCTTTGATTTTGTAGCTCAGCC-AACAATTGAAACCGAAGGCA | 2876 |
| Query | 2877 | TGGGCTGAAGAGGAGGCCATTATCGCGACAAGTAAGCAATACCGGTACAGGATCGTGGTG | 2936 |
| Sbjct | 2877 | TGGGCAGAGGAGGAAGCAATCATAGCTACAAGTAAGCAGTACCGGTACAGGATAGTGGTC | 2936 |
| Query | 2937 | CTGAGTGCCGATAAGGAGCAAACAGTTATTTATAGCCCGAAGGGTGAAGCGGTGCAGTCC | 2996 |
| Sbjct | 2937 | TTGAGCGCAGATAAAGAGCAAACAGTGACCTATAGCCCAAATCAGAAGCAGTGCAGTCC | 2996 |
| Query | 2997 | ATGGTTCTATACCAGCCGGGCCACTTTGAGGCAGCTTTGCCCGGAACGATTGCGTG | 3056 |
| Sbjct | 2997 | ATGGTTCTATACCATGCCGAGCTCACTTTGGGCAGCTTTGCCAGGAATGATTGTGTG | 3056 |
| Query | 3057 | CTTGTGGCTGTGCGTCTGTCTTGGCGAGACGAGTTGAAGAGGTGCTTTCAATTCTAGGT | 3116 |
| Sbjct | 3057 | CTCGTTGCTGTAGCATCAGTCTTGAGGAGGCGTATTGAGGAGGTGCTTTCGATCCTGGGT | 3116 |
| Query | 3117 | GCGCAGTTGGGTAATGAGTTTCTTCAGGATGTACTAAAGGGTGAAGGAATTAATCGGGAC | 3176 |
| Sbjct | 3117 | GCGCAAATGGGTTTCAAGATTCCTCCAGGATGTGTTGAAGGGGAGGGCATCAATCGGGAT | 3176 |
| Query | 3177 | CAATTGGCCGTGGTTTTCAAACCTTTGACATCTGCGCGCATGTGCACGCGGAGGGTGAAG | 3236 |
| Sbjct | 3177 | CAGTTGGCTGTGGTGTCAAGCTCTTTGACATCTGTGCGCACATTCATGCTCAGAGCGAG | 3236 |
| Query | 3237 | GTTTTCTGTGATAAATCTGAAGGTAGATTGCACGGCACATTCATCTGAGCAAGGATCAT | 3296 |
| Sbjct | 3237 | GCATTCGTTGTAAATCCGGATGGCAGATTACATGGCACATTCATTTGAGTAAGGATCAC | 3296 |
| Query | 3297 | ATTGAGCATTTGAAGAGCAAACCGATCGGAATAACCAAGTTCACAAGTGTGCATGATGCT | 3356 |
| Sbjct | 3297 | ATAGAGCATTTGAAGAGCAAGCCGATAGGGGTTACTAAGTATACGAGTGTGCATGATGCA | 3356 |
| Query | 3357 | AGCTGTGAGATTAAGCAGGAAACACTCTCCATGCTTAAAGCCATGTGCACGTTGCTACCG | 3416 |
| Sbjct | 3357 | AGCTGCGAAATAAAGCCGGAACACTTTCTATGCTGAAAGCTATGTGCACGATGCTTCCT | 3416 |
| Query | 3417 | TACAACCCATGTGAGCTTAGAGCAAAGTGTGCTCGCTGATAGTTTGAATGCAGGCAGTACT | 3476 |

| | | | |
|-------|------|---|------|
| Sbjct | 7016 | CCCTAAGTTGGTATGTTCTAAGGCCGGGAATACAAGTTGTGTTTTACTAATCACTGGAG | 7075 |
| Query | 7076 | AATCAGTCCGGCTAGTCAATTGCGAGCTCACAAAGAGATTTGGTGAAGCCGTAGCAACAT | 7135 |
| Sbjct | 7076 | AGTCAGTCAAGCTGGTCAATTGCGAGCTCACAAAAGATCTAGTGGAGGCCGTGGCCACAC | 7135 |
| Query | 7136 | TGGGGCCGTGAAGCACCTTTAGGTTTACAGGTAAGAGTTCGAAGAACTGTCCACAGA | 7195 |
| Sbjct | 7136 | TAAGGCCATTGAAACACCTTTAGGTTTACAGGTAAGAGTTCGAATAAACTGCTTCACAGA | 7195 |
| Query | 7196 | GAAAATGCCGCCAACCCGGATCCAACAAGCTCAGGAGAGACACCACAAGCAATACCGCT | 7255 |
| Sbjct | 7196 | GAGAATGCCGCCTAAACCAGATCCTTCTAGTTCAGGGGAAGTACCACAAGCTATGCCACC | 7255 |
| Query | 7256 | TGCGCCGCCCGCCCGGAACGTAGAGGAGCATAGAGTTGGCCCAAGTCAAGG-GCACGGGC | 7314 |
| Sbjct | 7256 | TGCACCACCTCCGCGCAATTCCGAAGGCGACAGA-TCCGCGCAATCGGAGGCCCGAGGGC | 7314 |
| Query | 7315 | AGAATGAAGAAGCTATGCTGGAGCAGAGGCTCATCAGATTGATTGAACTCATGGCCTCGA | 7374 |
| Sbjct | 7315 | AAAATGAAGAAGCCATGCTGGAACAAGGCTCGTTCGATTGATTGAGCTTATGGCCAAAA | 7374 |
| Query | 7375 | AAAGGCACAATTCAACATTGAGCAACATCTCTTTTGAGATAGGTAGGCCCTCGCTTGAGC | 7434 |
| Sbjct | 7375 | AGAGGCACAACTCGACGTTGAGTAACATCTCTTTTGAGATAGGTAGGCCCAGTTTGAAC | 7434 |
| Query | 7435 | CGACCCCTGAAATGCGGAGGAATCCGGAGAATCCATACTCGCGGTTTTCAATCGATGAGC | 7494 |
| Sbjct | 7435 | CAACACCCGAGATGAGAAGGAATCCGGAAAAATCCATACTCTCGATTCTCAATTGACGAGC | 7494 |
| Query | 7495 | TGTTCAAGATGGAAATCCGATCTGTGTCCAACAACATGGCGAACACTGAGCAAATGGCAC | 7554 |
| Sbjct | 7495 | TGTTCAAAAATGGAAATCCGGTCCGTTGCGAACACAACATGGCCAATACTGAACAAATGGCAC | 7554 |
| Query | 7555 | AAATCACTGCTGATATCGTGGGCTTGGGGTCCCCACTGAACACGTTGCAGGGGTAATAC | 7614 |
| Sbjct | 7555 | AGATCACTGCAGATATTGCCGGGCTCCGGTGTCCACTGAGCATGTTGCTGGCGTCATAC | 7614 |
| Query | 7615 | TGAAAGTGGTATCATGTGTGCAAGCGTGAGTAGCTCTGTTTTATCTAGATCCAGCAGGGA | 7674 |
| Sbjct | 7615 | TGAAGTTCGTGATCATGTGCGCAAGCGTAAGCAGTTCTGTCTACCTAGACCCTGCAGGAA | 7674 |
| Query | 7675 | CTGTGGAGTTCCCAACAGGCGCAGTGCCCTTGGAATCAATCATGCAATTATGAAGAATC | 7734 |
| Sbjct | 7675 | CTGTTGAGTTCCCCACTGGAGCAGTCCCTTTGGAATCCATAATTGCAATCATGAAAAATC | 7734 |
| Query | 7735 | GCGCGGGATTGAGAAAAGTGTGCAGGCTGTATGCTCCAGTCCGTGGAATTACATGCTAG | 7794 |
| Sbjct | 7735 | GTGCTGGACTGAGGAAGGTGTGCAGGCTGTATGCCCGGTCGTCTGGAATTACATGCTCG | 7794 |
| Query | 7795 | TCCAGAATAGGCCACCTTCGGATTGGCAGGCCATGGGATTCCAGTGGAACGCACGCTTCG | 7854 |
| Sbjct | 7795 | TTCAGAACAGGCTCCCTTCGGACTGGCAGGCAATGGGGTTTTCAATGGAATGCACGCTTTG | 7854 |
| Query | 7855 | CCGCATTGACACATTGATTATGTGACTAATGGGGCTGCAATTCAGCCGTAGAGGGGC | 7914 |
| Sbjct | 7855 | CCGCTTTTACACATTTGATTATGTGACTAAGCGCGCCGATCCAGCCTGTGAGGGGC | 7914 |
| Query | 7915 | TCATACGCAGGCCACACCTGAGGAAACAATAGCTCACAATGCCACAAGAGTATGGCGA | 7974 |
| Sbjct | 7915 | TAATCCGTAGGCCACGCTGAGGAGACGGTAGCTCATAACGCTCACAAAGAGCATGGCAA | 7974 |
| Query | 7975 | TTGACAAGTCGAACAGAAAATGAGCGATTGGCCAACACGAATGTTGAGTACACTGGAGGGA | 8034 |
| Sbjct | 7975 | TTGATAAGTCTAACAGAAAATGAAAGGCTGGCTAACACCAACGTTGAATACACCGGGGCA | 8034 |
| Query | 8035 | TGCTTGGCGCCGAGATTGTGCGCAATCACCGTAATGCGATCAACCAATGAAGGCAGACCG | 8094 |
| Sbjct | 8035 | TGCTCGCGCCTGAGATCGTGCCTAACCATCGGAATGCAGCAAACCAATGAGAGCGGAACG | 8094 |
| Query | 8095 | TTTAGCCATGTTATTATGTGTGTCCATCGACTGGGATATGTTTTGCCAGTTGAAAGTTG | 8154 |
| Sbjct | 8095 | TCTAAAATATGTTACTTCTGTGTGTTTACCGACTGGGTATATCTTACCGGTCGATGTGTG | 8154 |
| Query | 8155 | TGTAAATATAATAAGCCTAAGCGCAGGTCCAGTTTCTAGGGGCAGGTCCACTTACGCTCG | 8214 |
| Sbjct | 8155 | TATTAATAATAAAGTCTAGTGCAGGTCCAGTTTCCAGGGGTCATTCAACTTACTCAG | 8214 |
| Query | 8215 | TAAGCGGAGGGCCCGCAGCATTGGCGATGCTGGCGATGTTATCGTGTCTATCCACCTAT | 8274 |

| | | | |
|-------|------|--|------|
| Sbjct | 8215 | TAAGCGAAGGGCTCGCAGCATTGGCCGATGCTGGCGTTGTTACCGAGTCTATCCACCAGT | 8274 |
| Query | 8275 | TTGTAATTCTAAGTGTGATAATAGAACGTGCCGTCCAGGCATTAGTCAAAATTATAAAGT | 8334 |
| | | | |
| Sbjct | 8275 | TTGTAATTCTAAGTGTGATAATAGGACATGTCGTCCAGGCATAAGTCCAAACTATAAAGT | 8334 |
| Query | 8335 | AGTGACTTTCATTCGGGGTTGGAGTAACTGAGGTGATACCACCCATGGT-GCAAAGTCAG | 8393 |
| | | | |
| Sbjct | 8335 | AATGGCTTTCATTCGAGGTGGAGTAACTGAGGTGATACCACCAGGAATAGAATAGTCTA | 8394 |
| Query | 8394 | AGTTTCGCATAAAACTTAAATAATATATAAAGTGTGCAACTATAAAGAAAATATGTTTTTA | 8453 |
| | | | |
| Sbjct | 8395 | AGTTTCGCATAAAGCTTAAATAATATATAAAGTGTGCAACTATAAAGAAAAGTATGTTTTTA | 8454 |
| Query | 8454 | AAATA-TTTTAGCAT | 8467 |
| | | | |
| Sbjct | 8455 | AAATATTTTAGCAT | 8469 |