

Supplementary Material

Figure S1. Sequence alignment of wild-type *tsA_wt* and codon-optimized *tsA_mod* genes

| | | | |
|----------------------|-----|---|-----|
| <i>tsA_wt/1-996</i> | 1 | ATGAA AAAACTCTTAATCATCGGTACCGGTGGACGATTGCAAGCGCTAAAACAGAACAAAGGATACAAAAGTGTCCTCAAA | 81 |
| <i>tsA_mod/1-996</i> | 1 | ATGAAAGAAAGTTACTGATTATTGGCACTGGCGGCACAATCGCTTCGGCAAGACGGAGCAGGGTTATAAGAGCGTGTGAAAG | 81 |
| <i>tsA_wt/1-996</i> | 82 | ATAGATGAAATACCTTAACCTAGCCAAAATAAACTAGAAAATGGATATAAAATCGATAGCACCAATATTATGAACATAGAC | 162 |
| <i>tsA_mod/1-996</i> | 82 | ATCGACGAGATTCTCAAGCTTGCAAGATCAAGCTTGAGAACGGCTACCAAGATTGACTCCACGAACATCATGAATATTGAT | 162 |
| <i>tsA_wt/1-996</i> | 163 | AGCACTCTGATACACCCCTGAAGACTGGGAAATTATAGCTAAAGAGGTTTTCAGGCTCTTGATGATTATGATGGCATTATA | 243 |
| <i>tsA_mod/1-996</i> | 163 | TCCAGCTTGATTTCATCCAGAGGATGGGAGATCATCGCGAAGGAAAGTCTTTAAAGCACTCGACGACATCGACGGTATCATT | 243 |
| <i>tsA_wt/1-996</i> | 244 | ATAACCCATGGAAACAGACACTTTGSCCTACACCGCTTCAATGTTAAGTTTCATGATAAAAAACCCCAACAAACCAATTGTA | 324 |
| <i>tsA_mod/1-996</i> | 244 | ATTACTCACGGGACCAGATACCTTAGCGTATAGTGCATCTATGTTGCTTTTATGATTAAAGAAATCCGAATAAGCCATATCGTG | 324 |
| <i>tsA_wt/1-996</i> | 325 | CTCACTGGCTCTATGTTGCCAATAACAGAAAATGGAAGTGATGCCCCAGAAAACATCAGAACTGCCATAAAATTTCGAATG | 405 |
| <i>tsA_mod/1-996</i> | 325 | TTCAGCCGGGAGCATGCTCCCGATTACCGAGAACGGCTCAGACGCTCCGCGTAATATTCTAGCCGCTATCAAGTTCCGCATG | 405 |
| <i>tsA_wt/1-996</i> | 406 | GAGATGTGCGCAGGTGTTTTTGTAGCTTTTCATGGATAAAATAATGCTGGGTTGTAGGACATCTAAGGTTAGAACCTTCGGC | 486 |
| <i>tsA_mod/1-996</i> | 406 | GAAAGACGTTGCGCGGCGTGTTCTGTGGCGTTTATGGACAAGATTATGTTGGGCTGCCGTACGAGCAAAAGTCCGCACTTTGGGG | 486 |
| <i>tsA_wt/1-996</i> | 487 | CTAAATGCATTTATGAGCATAAAATTACCCCTGATGTGGCTTATGTAAAAGGAGAAAAGATCTTATACAATATCCCAAGAA | 567 |
| <i>tsA_mod/1-996</i> | 487 | CTTAAACGCCCTTCATGTCCTATCAACTATCCGGACGTCGCCCTACGTGAAGGGCGAGAAAATCTGTATAACATTCCAAAGGAG | 567 |
| <i>tsA_wt/1-996</i> | 568 | AAATTCCAACCAAAATGGTAGCCCTGAGCTAGATACAAAGTATGAACCAAGGGTTGTGTTTAAAGAGTTACCCCTGGCTTA | 648 |
| <i>tsA_mod/1-996</i> | 568 | AAGTTTCAGCCGAAACGGCTCTCCAGAACTGGACACCAAAATACGAGCCGGCGCGTGGAAGTACTGCGTGTAACCTCCGGGACTG | 648 |
| <i>tsA_wt/1-996</i> | 649 | GGGGGAGAGATCATAGATGCAGTCTTAGATGCTGGATATAAAGGCATAGTGCTAGAAGGCTATGGTGCGGGTGCTCTCCA | 729 |
| <i>tsA_mod/1-996</i> | 649 | GGTGGGGAAATTATTGACGCTGTGCTGGAACGGGGTTACAAAGGGTATTGTTTGGAAAGGTTACGGCGCCGGCGGGCTGCCG | 729 |
| <i>tsA_wt/1-996</i> | 730 | TATAGAAAGAGTAATCTTCTAAGCAAAATTAAAGAAATTACACCAAAAATCCCGGTAATTATGACAACCTCAAGCACTCTAT | 810 |
| <i>tsA_mod/1-996</i> | 730 | TACCGTAAAAGCAACCTGCTCTCTAAGATCAAAAGAGATCACTCCGAAAGATTCCCGTTATCATGACGACCCAGGGCGCTGTAC | 810 |
| <i>tsA_wt/1-996</i> | 811 | GATGGGGTTGACATGAGAAAATATGAAGTAGGACGAAAGGCATTAGAAACAGGAATTATCCCGCAAAAGACATGACAAAG | 891 |
| <i>tsA_mod/1-996</i> | 811 | GACGGAGTGATATGCTAAGTACGAGGTGGGCGCAAAAGCTCTTGAGACCGGTATCATTCGGGCGAAGGATATGACCAAA | 891 |
| <i>tsA_wt/1-996</i> | 892 | GAAACAACGATCACAAAGTTAATGTGGGCGCTTGGACACACAAAAGACGTTGAAAAGATAAGAGAAATATGCATACGAAC | 972 |
| <i>tsA_mod/1-996</i> | 892 | GAGGCTACCATTACGAAACTGATGTGGGCGCTGGGCGATACCAAGGATGTGGAGAAAATTCGTGAGATTATGCACACCAAT | 972 |
| <i>tsA_wt/1-996</i> | 973 | TACGTAAATGAAATAAAAAGCTAA | 996 |
| <i>tsA_mod/1-996</i> | 973 | TATGTGAACGAGATTAAAGAGTTGA | 996 |

Figure S2. Cytotoxic activity of TsA against cancer cells. Cancer cells and normal fibroblasts were cultivated for 72 h in the presence of different concentrations of the enzyme.

