**Table S3. Source sequences and detail on secreted protein**

| **Clone name** | **Accession** | **Mr (Da)****Secreted fusion** | **Catalytic start** | **AA of SIAT fusion** | **Sequence1** |
| --- | --- | --- | --- | --- | --- |
| hST3 A1 | AF525084\_1 | 41166 | Ala-47 | 289 | AESKASKLFGKLSPLCSYSRDQPIFLRLEDYFWVKTPSAYELPYGTKGSEDLLLRVLAITSSSIPKNIQSLRCRRCVVVGNGHRLRNSSLGDAINKYDVVIRLNNAPVAGYEGDVGSKTTMRLFYPESAHFDPKVENNPDTLLVLVAFKAMDFHWIETILSDKKRVRKGFWKQPPLIWDVNPKQIRILNPFFMEIAADKLLSLPMQQPRKIKQKPTTGLLAITLALHLCDLVHIAGFGYPDAYNKKQTIHYYEQITLKSMAGSGHNVSQEALAIKRMLEMGAIKNLTSF |
| hST3 A2 | NP\_001241686 | 40551 | Ala-47 | 283 | AESKASKLFGNYSRDQPIFLRLEDYFWVKTPSAYELPYGTKGSEDLLLRVLAITSSSIPKNIQSLRCRRCVVVGNGHRLRNSSLGDAINKYDVVIRLNNAPVAGYEGDVGSKTTMRLFYPESAHFDPKVENNPDTLLVLVAFKAMDFHWIETILSDKKRVRKGFWKQPPLIWDVNPKQIRILNPFFMEIAADKLLSLPMQQPRKIKQKPTTGLLAITLALHLCDLVHIAGFGYPDAYNKKQTIHYYEQITLKSMAGSGHNVSQEALAIKRMLEMGAIKNLTSF |
| zST3 | NP\_001076498 | 39169 | Glu-55 | 281 | ENLNLNMSRKPELFLKLEDFFWKDHLSAEALPYGIKGSELLLLKVLAAISSFTMPANIESLDCRTCAVIGNGFALKNSSLGEIINKYDVVIRLNDAPVRGFEEDVGNKTTLRLFYPESASYNPGIHNDPDTLLVLVPFKQQDLRWLKEILYDEKRVQKGFWKPPPQIWLGRASQIRVLDPYFLRITARKFLQIPVQPRKQQKAVHPTTGLLAVFVALNYCDVVHVAGFGYPASRNQNQPIHYYGQQTMKSMKNSYHDLNQEAQILHRLEEQGVILYLHPHS |
| hST6 | NP\_003023.1 | 47993 | Val-63 | 344 | VSSSSTQDPHRGRQTLGSLRGLAKAKPEASFQVWNKDSSSKNLIPRLQKIWKNYLSMNKYKVSYKGPGPGIKFSAEALRCHLRDHVNVSMVEVTDFPFNTSEWEGYLPKESIRTKAGPWGRCAVVSSAGSLKSSQLGREIDDHDAVLRFNGAPTANFQQDVGTKTTIRLMNSQLVTTEKRFLKDSLYNEGILIVWDPSVYHSDIPKWYQNPDYNFFNNYKTYRKLHPNQPFYILKPQMPWELWDILQEISPEEIQPNPPSSGMLGIIIMMTLCDQVDIYEFLPSKRKTDVCYYYQKFFDSACTMGAYHPLLYEKNLVKHLNQGTDEDIYLLGKATLPGFRTIHC |
| hST6 B1 | NP\_003023.1 | 48023 | Val-63 | 344 | VSSSSTQDPHRGRQTLGSLRGLAKAKPEASFQVWNKDSSSKNLIPRLQKIWKNYLSMNKYKVSYKGPGPGIKFSAEALRCHLRDHVNVSMVEVTDFPFNTSEWEGYLPKESIRTKAGPWGRCAVVSSAGSLKSSQLGREIDDHDAVLRFNGAPTANFQQDVGTKTTIRLMNSQLVTTEKRFLKDSLYNEGILIVWDPSVYHSDIPKWYQNPDYNFFNNYKTYRKLHPNQPFYILKPQMPWELWDILQEISPEEIQPNPPSSGMLSIIIMMTLCDQVDIYEFLPSKRKTDVCYYYQKFFDSACTMGAYHPLLYEKNLVKHLNQGTDEDIYLLGKATLPGFRTIHC |
| hST6 A5 | NP\_003023.1 | 48009 | Val-63 | 344 | VSSSSTQDPHRGRQTLGSLRGLAKAKPEASFQVWNKDSSSKNLIPRLQKIWKNYLSMNKYKVSYKGPGPGIKFSAEALRCHLRDHVNVSMVEVTDFPFNTSEWEGYLPKESIRTKAGPWGRCAVVSSAGSLKSSQLGREIDDHDAVLRFNGAPTANFQQDVGTKTTIRLMNSQLVTTEKRFLKDSLYNEGILIVWDPSVYHSDIPKWYQNPDYNFFNNYKTYRKLHPNQPFYTLKPQMPWELWDILQEISPEEIQPNPPSSGMLGIIIMMTLCDQVDIYEFLPSKRKTDVCYYYQKFFDSACTMGAYHPLLYEKNLVKHLNQGTDEDIYLLGRATLPGFRTIHC |
| zST6 | NP\_001003853.1 | 52811 | Val-63 | 422 | VKVLRGTGGSKPMYTDPQKLPGVIPGDPQKPIPILSSSNYSMESTSKDISLGGKKRERGLFYWLLAQPLTIFGGRRRGDMGTAIRDADVFKPNGALGEVWNEEMSSSMLGKRLRKVVQNYQAMNKYGVKYPATVRAAHRYKLSGPEILCEIKEKVQVTTLTPDMEPFSGFPWGSQLPPRQITSDVGPFKTCAVVSSAGSLKNSGLGKEIDSHDAVIRFNAAPTAGFETDVGSKTTVRLINSQLMASEDHHFLSSSLYSAGILVSWDPSPYSSDLWEWFNKTDYPIFKQYQRYRRLHPQQPFYIVHPRMEWQLWQRIQDNMGEAIQKNPPSSGLLGTVLMMSLCEVVHVYEFLPSRRKTELCHYYQRFSDAACTLGAYHPLLYEKNLVKRMNQGSDRDIYTLGRVTLPGFATFNCTSSTHSKT |
| rST6 | P13721.1 | 48422 | Val-60 | 344 | VFSNSKQDPKEDIPILSYHRVTAKVKPQPSFQVWDKDSTYSKLNPGLLKIWRNYLNMNKYKVSYKGPGPGVKFSVEALRCHLRDHVNVSMIEATDFPFNTTEWEGYLPKENFRTKVGPWQRCAVVSSAGSLKNSQLGREIDNHDAVLRFNGAPTDNFQQDVGSKTTIRLMNSQLVTTEKRFLKDSLYTEGILIVWDPSVYHADIPKWYQKPDYNFFETYKSYRRLNPSQPFYILKPQMPWELWDIIQEISADLIQPNPPSSGMLGIIIMMTLCDQVDIYEFLPSKRKTDVCYYHQKFFDSACTMGAYDPLLFEKNMVKHLNEGTDEDIYLFGKATLSGFRNIRC |
| sST6 | CBQ74103.1 | 47495 | Thr-136 | 355 | TLFGGRRRGELSGRVGEAEFFGPHGLLGEVWDDEMSSSMLGSRLRKVVQNYQAMNKYGVEFSGPGGVSSRPKLSGPKLLCQLRDKVKVTTLTNDLEPFSSLSWAVQLPPNTLTSDLGPYRSCAVVSSAGSLRNSGLGKEIDSHDAVLRFNAAPTTGYEKDVGSKTTIRLINSQVMASDDHRFLSSSLYSSGVLVAWDPAPFSADLTQWYNRTDYPIFTQYQRYRKLHPMQPFYILHPRFEWQVWQRIQDNMAEPIQKNPPSSGLLGTVLMMSLCEVVHVYEFLPSRRKTELCHYYQRFHDAACTLGAYHPLLYEKNLVKRMNRGPDRDIYTHGRVTLPGFGKMNCTEAAGGSTSR |
| fST6 | NP\_001027933.1 | 48454 | Thr-136 | 358 | TLFGGRRKGELSGRGGDAALFGPRGILGEVWDDEMSSSMLGNRLKKVVQNYQAMNKYGVKVSGPGGVSSRPKLSGPKLLCQMKIQVDVSTLTSDFQPFSSLPWASQLPSKQLTSNLGPYKSCAVVTSAGSMRSSGLGKEIDSHDAVLRFNAAPTSGYENDVGSKTTIRLVNSQVMASEAHRFLSSSLYSSGTLVAWDPAPFSADLTQWFNRTDYPIFTQYQRYRMLHPMQPFYILHPRFEWQVWQRIQDNMAEPIQKNPPSSGLLGTVMMMSLCEVVHVYEFLPSRRKTELCHYYQRFFDAACTLGAYHPLLYEKNLVKRMNQGPERDIYTHGRITLPGFNTLNCTGDAGGALVDMRH |
| cST6 | XP\_015132322 | 48211 | Gln-69 | 345 | QMPKALPNNQNKVKGITSGAVEKSRKAAEHVKVWDKDSSSRNLIPRLQKVRKNYLSMNKYNVTYNGKMNAAKLSPEQLLCRLRDRVNVTMIRGSDGPFNSSEWQHYLPDKSLNETVGRLGRCAVVSSAGSLKSSHLGPEIDSHDAVLRFNGAPVKGFQEDVGQKTTIRLVNSQLVTVEEQQFLKDALYNTGILIVWDPAPYHAEIHEWYRKPDYKFFEAYKSYRIRHPEQPFYILNPKMQWQLWDILQENSLEHIQPNPPSSGMLGIVIMMTLCDEVDVYEFLPSKRQTDICHYYQKFHDHACTMGAYHPLLFEKNLVKHLNQGTDEDIYTHGKVTLPGFRNVHC |
| hST6Gal2 | NP\_115917 | 49514 | Val-173 | 357 | VKKRHRRQRRSHVLEEGDDGDRLYSSMSRAFLYRLWKGNVSSKMLNPRLQKAMKDYLTANKHGVRFRGKREAGLSRAQLLCQLRSRARVRTLDGTETPFSALGWRRLVPAVPLSQLHPRGLRSCAVVMSAGAILNSSLGEEIDSHDAVLRFNSAPTRGYEKDVGNKTTIRIINSQILTNPSHHFIDSSLYKDVILVAWDPAPYSANLNLWYKKPDYNLFTPYIQHRQRNPNQPFYILHPKFIWQLWDIIQENTKEKIQPNPPSSGFIGILIMMSMCREVHVYEYIPSVRQTELCHYHELYYDAACTLGAYHPLLYEKLLVQRLNMGTQGDLHRKGKVVLPGFQAVHCPAPSPVIPHS |

1 Where the sequence differs from the accession the amino acid is marked in red text and highlighted. The corresponding native sequence (if included) is highlighted.