

Supplementary Material. Amino acid sequences of dCas9-fusion proteins.

dCas9-TET1CD

Flag-NLS

Streptococcus pyogenes dCas9 (D10A, H840A)

NLS

GGGGS linker

mouse TET1CD (inactive mutant; H1620Y, D1622A)

MDYKDDDDKMAPKKKRKVGIHGVPAA

DKKYSIGLAIGTNSVGWAVITDEYKVPSKKFKVLGNTDRHSIKKNLIGAL
LFDSGETAEATRLKRTARRRYTRRKNRICYLQEIFSNEMAKVDDDSFFHR
LEESFLVEEDKKHERHPIFGNIVDEVAYHEKYPTIYHLRKKLVDSTDKA
DLRLIYLALAHMIKFRGHFLIEGDLNPDNSDVKLFIQLVQTYNQLFEEN
PINASGVDAKAILSARLSKSRLENLIAQLPGEKKNGLFGNLIASLGLTP
NFKSNFDLAEDAQLSKDQYDDDLNLLAQIGDQYADFLAAKNLSD
AILSDILRVNTEITKAPLSASMIKRYDEHHQDLTLLKALVRQQLPKEYK
EIFFDQSKNGYAGYIDGGASQEEFYKFIKPILEKMDGTEELLVKLNREDL
LRKQRTFDNGSIPHQIHLGELHAILRRQEDFYPPFLKDNREKIEKILTFRIP
YYVGPLARGNSRFAWMTRKSEETITPWNFEEVVDKGASAQSFIERMTNF
DKNLPNEKVLPKHSLLEYFTVYNELTKVKYVTEGMRKPAFLSGEQKK
AIVDLLFKTNRKVTVKQLKEDYFKKIECFDSVEISGVEDRFNASLGTYHD
LLKIIKDKDFLDNEENEDILEDIVLTLTLFEDREMIEERLKYAHLFDDK
VMKQLKRRRYTGWGRLSRKLINGIRDKQSGKTILDFLKSDGFANRNF
QLIHDDSLTFKEDIQKAQVSGQGDSLHEHIANLAGSPAIKKGILQTVKV
DELVKVMGRHKPENIVIAMARENQTTQKGQKNSRERMKRIEIEGKELG
SQILKEHPVENTQLQNEKLYLYLQNGRDMYVDQELDINRLSDYDVAI
VPQSFLKDDSIDNKVLTRSDKNRGKSDNVPSEEVVKKMKNYWRQLLNA
KLITQRKFDNLTKAERGGLSELDKAGFIKRQLVETRQITKHVAQILDSRM
NTKYDENDKLIREVKVITLKSCLVSDFRKDFQFYKVVREINNYHHAHDAY
LNAVVGTAIIKKYPKLESEFVYGDKVYDVRKMIKSEQEIGKATAKYF
FYSNIMNFFKTEITLANGEIRKRPLIETNGETGEIVWDKGRDFATVRKVL

SMPQVNIVKKTEVQTGGFSKESILPKRNSDKLIARKKDWDPKKYGGFDS
PTVAYSVLVVAKVEKGKSKKLKSVKELLGITIMERSSEFEKNPIDFLEAKG
YKEVKKDLIIKLPKYSLFELENGRKRMLASAGELQKGNELALPSKYVNF
LYLASHYEKLKGSPEQNEQKQLFVEQHKHYLDEIIEQISEFSKRVLADA
NLDKVL SAYNKH RD KPIREQAENIIHLFTLTNLGAPAAFKYFDTTIDRKR
YTSTKEVLDATLIHQ SITGLYETRIDLSQLGGD

KRPAATKKAGQAKKKKAS

GGGGS

QEAAPCD CDGGTQKEKGPYYTHLGAGPSVA AVRELMETRFGQKGKAIRI
EKIVFTGKEGKSSQGCPVAKWVIRRS GP E EKLICLV RERVDHHCSTAVIV
VLILLWEGIPRLMADRLYKELTENLRSYSGHPTDRRCTLNKKRTCTCQGI
DPKTCGASFSGCSWSMYFNGCKFGRSENPRKFRLAPNYPLHNYKRYK
GMSSEGSDVKTGWIIPDRKTLISREEKQLEKNLQELATVLAPLYKQMAP
VAYQNQVEYEEVAGDCRLGNEEGRPFSGVTCCMDFCASHKDIHNMH
NGSTVVCTLIRADGRDTNCPEDQLHVLPLYRLADTDEFGSVEGMKAKI
KSGAIQVNGPTRKRRLRFTEPVPRCGKRAKMKQNHKSGSHNTKSFSS
ASSTSHLVKDESTDFCPLQASSAETSTCTYSKTASGGFAETSSILHCTMPS
GAHSGANAAAGECTGT VQPAEVA AHPHQSLPTADSPVHAEPLTSPSEQL
TSNQSNNQLPLLSNSQKLASCQVEDERHPEADEPQHPEDDNLPQLDEF
WSDSEEIYADPSFGGVAIAPIHGSVLIECARKELHATTSLRSPKRGVPFRV
SLVFYQHKS LN KPNHGF DINKIKCKCKKVTKKKPADREC PDVSPEANLS
HQIPSRVASTLTRDNVTVSPYSLTHVAGPYNRWVZ

dCas9-p300CD

Flag-NLS

Streptococcus pyogenes dCas9 (D10A, H840A)

NLS

GGGGS linker

mouse p300CD (inactive mutant; D1398Y)

MDYKDDDDKMAPKKKRKVGIHGVPAA

DKKYSIGL A IGTNSVGWAVITDEYKVPSKKFKVLGNTDRHSIKKNLIGAL
LFDSGETAEATRLKRTARRRYTRRKNRICYLQEIFS NEMAKVDD SFFHR
LEESFLVEEDKKHERHPIFGNIVDEVAYHEKYPTIYHLRKKLVDSTDKA
DLRLIYLALAHMIKFRGHFLIEGDLNPDNSDVKLFIQLVQTYNQLFEEN
PINASGVDAKAILSARLSKSRLENLIAQLPGEKKNGLFGNLIASLGLTP
NFKSNFDLAEDA KLQLSKDTYDDDLNLLAQIGDQYADLFLAAKNLSD
AILLSDILRVNTEITKAPLSASMIKRYDEHHQDLTLLKALVRQQLPKEYK
EIFFDQSKNGYAGYIDGGASQEEFYKFIKPILEKMDGTEELLVKLNREDL
LRKQRTFDNGSIPHQIHLGELHAILRRQEDFYFPLKDNREKIEKILTRIP
YYVGPLARGNSRFAWMTRKSEETITPWNFEEVVDKGASAQSFIERMTNF
DKNLPNEKVLPKHSLLEYFTVYNELTKVKYVTEGMRKPAFLSGEQKK
AIVDLLFKTNRKVTVKQLKEDYFKKIECFDSVEISGVEDRFNASLGTYHD
LLKIIKDKDFLDNEENEDILEDIVLTTLTFEDREMIEERLKYAHLFDDK
VMKQLKRRRYTGWGRLSRKLINGIRDKQSGKTILDFLKSDGFANRNF
QLIHDDSLTFKEDIQKAQVSGQGDSLHEHIANLAGSPAIKKGILQTVKV
DELVKVMGRHKPENIVIEMARENQTTQKGQKNSRERMKRIEEGIKELG
SQILKEHPVENTQLQNEKLYLYLQNGRDMYVDQELDINRLSDYDVD A I
VPQSFLKDDSIDNKVLTRSDKNRGKSDNVPSEEVVKMKMKNYWRQLLNA
KLITQRKFDNLTKAERGGLSELDKAGFIKRQLVETRQITKHVAQILDSRM
NTKYDENDKLIREVKVITLKSCLVSDFRKDFQFYKVREINNYHHAHDAY
LNAVVG TALIKKYPKLESEFVYG DYKVYDVRKMIAKSEQEIGKATAKYF
FYSNIMNFFKTEITLANGEIRKRPLIETNGETGEIVWDKGRDFATVRKVL
SMPQVNIVKKTEVQTGGFSKESILPKRNSDKLIARKKDWDPKKYGGFDS
PTVAYSVLVVAKEVGKSKKLKSVKELLGITIMERS SFEKNPIDFLEAKG
YKEVKKDLIIKLPKYSLFELNGRKRMLASAGELQKGNELALPSKYVNF
LYLASHYEKLKGSPEDNEQKQLFVEQHKHYLDEIIEQISEFSKRVLADA
NLDKVL SAYNKH RDKPIREQAENIIHLFTLTNLGAPAAFKYFDTTIDRKR
YTSTKEVL DATLIHQ SITGLYETRIDLSQLGGD

KRPAATKKAGQAKKKKAS

GGGGS

IFKPEELRQALMPTLEALYRQDPESLPFRQPVPDPQLLGIPDYFDIVKSPM
DLSTIKRKLDTGQYQEPWQYIDDIWLMFNNAWLYNRKTSRVYKYCSKL
SEVFEQEIDPVMQSLGYCCGRKLEFSPQTLCCYGKQLCTIPRDATYYSYQ

NRYHFCEKCFNEIQGESVSLGDDPSQPQTTINKEQFSKRKNDTLDPELF
VECTECGRKMHQICVLHHEIHWPSGFVCDGCLKKTARTRKENKLSAKRL
PSTRLGTFLENRVNDFLRRQNHPESGEVTVRVHVASDKTVEVKPGMKA
RFVDSGEMAESFPYRTKALFAFEEIDGVDLCCFFGMHVQEYGSDCPPPNQ
RRVYISYLD¹SVHFFRPKCLRTAVYHEILIGYLEYVKKLGYTTGHIWACPP
SEGDDYIFHCHPPDQKIPKPKRLQEWYKKMLDKAVSERIVHDYKDILKQ
ATEDRLTSAKELPYFEGDFWPNVLEESIKELEQEEEEERKREENTSNEST
DVTKGDSKNAKKKNNKTSKNKSSLSRGNKKKPGMPNVSNDLSQKLY
ATMEKHKEVFFVIRLIACPAPNSLPPIVDPDPLIPCDLMDGRDAFLTAR
DKHLEFSSLRRAQWSTMCMMLVELHTQSQDZ