

Table S1. Related to STAR METHODS. List of plasmids generated or used in this study.

Name [vector_gene(s)]	Promoters	Availability
pcDNA3.1_LCK ₁₋₁₀ ::HA::MCP	CMV	Available upon request
pcDNA3.1_LCK ₁₋₁₀ ::Myc::EWSR1 ₁₋₆₂₈ ::4xλ _{N22}	CMV	Available upon request
pcDNA3.1_LCK ₁₋₁₀ ::EWSR1 ₁₋₆₂₈ ::HA::MCP	CMV	Available upon request
pcDNA3.1_LCK ₁₋₁₀ ::FLAG::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_LCK ₁₋₁₀ ::FUS ₁₋₄₇₈ ::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_LCK ₁₋₁₀ ::FUS ₁₋₄₇₈ ::HA::MCP::FLAG::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_LCK ₁₋₁₀ ::FUS ₁₋₄₇₈ ::HA::MCP::FLAG::NES::PyIRS ^{N346A, C348A}	CMV	Available upon request
pcDNA3.1_LCK ₁₋₁₀ ::FUS ₁₋₄₇₈ ::V5::Myc::4xλ _{N22} ::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_EBAG9 ₁₋₂₉ ::HA::MCP	CMV	Available upon request
pcDNA3.1_EBAG9 ₁₋₂₉ ::EWSR1 ₁₋₆₂₈ ::Myc::4xλ _{N22}	CMV	Available upon request
pcDNA3.1_EBAG9 ₁₋₂₉ ::EWSR1 ₁₋₆₂₈ ::HA::MCP	CMV	Available upon request
pcDNA3.1_EBAG9 ₁₋₂₉ ::FLAG::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_EBAG9 ₁₋₂₉ ::FUS ₁₋₄₇₈ ::FLAG::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_EBAG9 ₁₋₂₉ ::FUS ₁₋₄₇₈ ::HA::MCP::FLAG::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_EBAG9 ₁₋₂₉ ::FUS ₁₋₄₇₈ ::V5::Myc::4xλ _{N22} ::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_CYPIC1 ₁₋₂₇ ::HA::MCP	CMV	Available upon request
pcDNA3.1_CYPIC1 ₁₋₂₇ ::EWSR1 ₁₋₆₂₈ ::Myc::4xλ _{N22}	CMV	Available upon request

pcDNA3.1_CYPIC1 ₁₋₂₇ ::EWSR1 ₁₋₆₂₈ ::HA::MCP	CMV	Available upon request
pcDNA3.1_CYPIC1 ₁₋₂₇ ::V5::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_CYPIC1 ₁₋₂₇ ::FUS ₁₋₄₇₈ ::V5::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_CYPIC1 ₁₋₂₇ ::FUS ₁₋₄₇₈ ::HA::MCP::FLAG::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_CYPIC1 ₁₋₂₇ ::FUS ₁₋₄₇₈ ::V5::Myc::4xλ _{N22} ::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_TOM20 ₁₋₇₀ ::MCP	CMV	Available upon request
pcDNA3.1_TOM20 ₁₋₇₀ ::EWSR1 ₁₋₆₂₈ ::Myc::4xλ _{N22}	CMV	Available upon request
pcDNA3.1_TOM20 ₁₋₇₀ ::EWSR1 ₁₋₆₂₈ ::HA::MCP	CMV	Available upon request
pcDNA3.1_TOM20 ₁₋₇₀ ::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_TOM20 ₁₋₇₀ ::FUS ₁₋₄₇₈ ::V5::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_TOM20 ₁₋₇₀ ::FUS ₁₋₄₇₈ ::HA::MCP::FLAG::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_TOM20 ₁₋₇₀ ::FUS ₁₋₄₇₈ ::V5::Myc::4xλ _{N22} ::NES::PyIRS ^{Y306A, Y384F}	CMV	Available upon request
pcDNA3.1_TOM20 ₁₋₇₀ ::FUS ₁₋₄₇₈ ::V5::Myc::4xλ _{N22} ::NES::PyIRS ^{N346A, C348A}	CMV	Available upon request
pBI_CYPIC1 ₁₋₂₇ ::EWSR1 ₁₋₆₂₈ ::HA::MCP::VSV-G::NES::PyIRS ^{Y306A, Y384F} ::FUS ₁₋₄₇₈ ::PyIRS ^{Y306A, Y384F} _U6-tRNA ^{Pyl, CUA} (see Table S2 for further details)	pBI-CMV, U6	Available upon request
pBI_LCK ₁₋₁₀ ::HA::MCP::SPOT::NES::PyIRS ^{N346A, C348A} ::FUS ₁₋₄₇₈ ::PyIRS ^{N346A, C348A} _U6-tRNA ^{Pyl, CUA} (see Table S2 for further details)	pBI-CMV, U6	Available upon request
pBI_TOM20 ₁₋₇₀ ::EWSR1 ₁₋₆₂₈ ::Myc::4xλ _{N22} ::VSV-G::NES::PyIRS ^{Y306A, Y384F} ::FUS ₁₋₄₇₈ ::PyIRS ^{Y306A, Y384F} _U6-tRNA ^{Pyl, CUA} (see Table S2 for further details)	pBI-CMV, U6	Available upon request
pBI_TOM20 ₁₋₇₀ ::EWSR1 ₁₋₆₂₈ ::Myc::4xλ _{N22} ::SPOT::NES::PyIRS ^{N346A, C348A} ::FUS ₁₋₄₇₈ ::PyIRS ^{N346A, C348A} _U6-tRNA ^{Pyl, CUA} (see Table S2 for further details)	pBI-CMV, U6	Available upon request
pBI_CYPIC1 ₁₋₂₇ ::EWSR1 ₁₋₆₂₈ ::HA::MCP::VSV-G::NES::PyIRS ^{Y306A, Y384F} ::FUS ₁₋₄₇₈ ::PyIRS ^{Y306A, Y384F} _TOM20 ₁₋₇₀ ::EWSR1 ₁₋₆₂₈ ::Myc::4xλ _{N22} ::SPOT::NES::PyIRS ^{N346A, C348A} ::FUS ₁₋₄₇₈ ::PyIRS ^{N346A, C348A} _U6-tRNA ^{Pyl, CUA} (see Table S2 for further details)	pBI-CMV, U6	Available upon request

pBI_LCK ₁₋₁₀ ::HA::MCP::SPOT::NES::PyIRS ^{N346A,C348A} ::FUS ₁₋₄₇₈ :: PyIRS ^{N346A,C348A} _TOM20 ₁₋₇₀ ::EWSR1 ₁₋₆₂₈ ::Myc::4xλ _{N22} ::VSV-G:: NES::PyIRS ^{Y306A,Y384F} ::FUS ₁₋₄₇₈ ::PyIRS ^{Y306A,Y384F} _tRNA ^{PyI,CUA} (<i>see Table S2 for further details</i>)	pBI-CMV, U6	Available upon request
pBI_NLS::mCherry ^{190TAG} ::6xHis::2xms2_NLS::FLAG::EGFP ^{39TAG} ::6xHis see also (Reinkemeier et al., 2019)	pBI-CMV	Available upon request
pBI_NLS::mCherry ^{190TAG} ::6xHis::4xboxB_NLS::FLAG::EGFP ^{39TAG} ::6xHis	pBI-CMV	Available upon request
pBI_NLS::mCherry ^{190TAG} ::6xHis::2xms2_ NLS::FLAG::EGFP ^{39TAG} ::6xHis::4xboxB	pBI-CMV	Available upon request
pBI_NLS::FLAG::EGFP ^{39TAG} ::6xHis::4xboxB_(empty MCS)::2xms2	pBI-CMV	Available upon request
pBI_NLS::FLAG::EGFP ^{39TAG} ::6xHis::2xms2_(empty MCS)::4xboxB	pBI-CMV	Available upon request
pBI_H2B::mCherry ^{190TAG} ::6xHis::2xms2_ Nup153::EGFP ^{149TAG} ::6xHis::4xboxB	pBI-CMV	Available upon request
pcDNA3.1_NES::PyIRS ^{N346A,C348A} see also (Reinkemeier et al., 2019)	CMV	Available upon request
pcDNA3.1_NES::PyIRS ^{Y306A,Y384F} see also (Nikić et al., 2016)	CMV	Available upon request
pUC57_U6-tRNA ^{PyI,CUA}	U6	Available upon request
pCI_NLS::iRFP713::FLAG::EGFP ^{39TAG} ::6xHis see also (Nikić et al., 2016)	CMV	Available upon request