

**Supplementary information, Table S5. Primers used for gene targeting**

Gene		Primers
NGN3	Insert-left-F	GGAAGATCT CTTTTGCGCCGGTAGAAAGGT
	Insert-left-R	CGGGGTACC CAGAAAATCTGAGAAAGCCAG
	Insert-right-F	CCGGAATTC AAGGACCTGTCTGTCTGCTGGGCTGT
	Insert-right-R	GCGTCGAC GTCATCTTGCCAAGGCTTCTTGAAG
	Shorten-left-F	GGAAGATCT GTTCATCTTGATCTCTCACTACCCA
	Shorten-left-R	CGGGATCC GAATTATTAGAGAGTCTCTCCTACA
	Shorten-right-F	TCCACCGGT CTCTCCCTATAGTGAGTCGTATTAG
	Shorten-right-R	GGGGTACC ATTCAGTCAGTTGCTCAATGTACC
	Targeting-test-F	CCTTCTTGACGAGTTCTTCTGAGGGGAT
	Targeting-test-R	GCAGAGGTGATGTGTGCTACTTCTGAGCAT
	probe-F	ATCTGAGGTGAGTATTCCAGGTGGG
	Probe-R	CATGTTGAAGGTTTGGGGAGGGAA
FOXA2	Insert-F	atacctcactaccaggggtgtactcccggccattatgaactcctct AAAATTGTCGCTCCTGTCAA
	Insert-R	TCAAGGGATAAAACCGGTATAACACTTTAATATAGA TTTGTGGAAGTCT tcgacggagctcgaattc
	Retrieve-F	ggggagcctctggggttacgagctgggtccaggagagaaaagtcagaaaagc ACTAGTGGATCCTCTAGAGT
	Retrieve-R	GTTCTGCGCGAACCCAAACCGCCTCCTGCACCCTG GCGAGGTTCTGGGA GCGGCCGCTTTTTTCCTTGT
	Targeting-Test-F	GCTCTATGGCTTCTGAGGCGGAAAGAAC
	Targeting-Test-R	GTTGCAGGGAGAATGCGATGATAAATGG
	Insert-F	cgtcgccacagccctccagcgtcgcgcctcggcggccgaggaaccacga AAAATTGTCGCTCCTGTCAA
PDX1	Insert-R	TCCAATGTGTATGGTACAGTTTCCATTGTCTTTGAAG AGCCGGCTTCTCT tcgacggagctcgaattc
	Retrieve-F	gagctcctgcaaaagctgaacgcagtagcctaccaagtcgcgcctgg ACTAGTGGATCCTCTAGAGT
	Retrieve-R	GCTGGCGGTGCTCCCCAAAATGGGCGCTCACGAAAA CATTAGAACCACTC GCGGCCGCTTTTTTCCTTGT
	Targeting-Test-F	GCTCTATGGCTTCTGAGGCGGAAAGAAC
	Targeting-Test-R	ACCTTACCTTGGGGTTGAAGATTCCAAG
SOX17	Insert-F	tggtgtccgagccagctccgcggtatattactgcaactatcctgacgtg AAAATTGTCGCTCCTGTCAA
	Insert-R	GGTTTTGACAATCCAATATGGGAAACAAATCTCTG AACAAATTTTAAAT tcgacggagctcgaattc
	Retrieve-F	caaattaagaaaagattctggctccagtagttccagtaataactgaaac ACTAGTGGATCCTCTAGAGT
	Retrieve-R	AACTATAGGAGGAGAGAGCAATCTACAAATTAAC CCCGTAGTACCTTG GCGGCCGCTTTTTTCCTTGT
	Targeting-Test-F	AAGAGAAAATTCTGCTTTGAGAGCTTTG
	Targeting-Test-R	CTCCTCGCCCTTGCTCACCATGGTGG
	probe-F	TCCTTCCCGATCGACTTGAGTGTCCTTC

	Probe-R	CGGGTTTCCCTATTTTTATTTGCCCTTG
MAFB	Insert-F	GGGAGGCGGGCTCCACCAGCGACAGCCCCTCCTCTC CCGAGTTCTTTCTG AAAATTGTCGCTCCTGTCAA
	Insert-R	GAAAGCCAGGAGTCTCCAGATGGCCTTGGTGACTTC TCGGGACTATGCCT tcgacggagctcgaattc
	Retrieve-F	CCCATACTGCAGTGGGAGCTGCCAGGAACCACGCCA GATCCACCAGGCTG ACTAGTGGATCCTCTAGAGT
	Retrieve-R	CCTACCCCTGCCAGGCTGTGGGTGAATGACGGAGAC ATGCAGGTGGCCGA GCGGCCGCTTTTTTCCTTGT
	Targeting-Test-F	GCCGAGCCTGGCATGCTGATCCAGAGAC
	Targeting-Test-R	CTCCTCGCCCTTGCTCACCATGGTGG
PAX6	Insert-F	aagttcccgaagtgaacctgatatgtctcaactggccaagattacag AAAATTGTCGCTCCTGTCAA
	Insert-R	TGTTTCAAGTCCATTCCTTCCCCAGTGGTACAATACA GGACACAATTGTA tcgacggagctcgaattc
	Retrieve-F	catttcagagtgcgttttatcagaggaagacaaaatacacaccctc ACTAGTGGATCCTCTAGAGT
	Retrieve-R	TATATCCCGACAGCCTCACCAAAACATCCCAAGGTA ACTGTCAGCCTTC GCGGCCGCTTTTTTCCTTGT
	Targeting-Test-F	AGTGAGGCATTTGGGGAGTTGGGGTTAC
	Targeting-Test-R	CTCCTCGCCCTTGCTCACCATGGTGG
NKX6.1	Insert-F	accagccagcgcctcgtcgaaggctacggctcggcgtggccgtggg GCCACCATGGTGAGCAAGGG
	Insert-R	GCGGCGGCGGCGGCCTCCTACTGCACGCGTCCGAGC CGGAGAGCTCATCC AAAATTGTCGCTCCTGTCAA
	Retrieve-F	gaagactttaaagagtagagcataatgtctgcatgggtttgatattac ACTAGTGGATCCTCTAGAGT
	Retrieve-R	AGCGAGAATCCCTTTCTGGAAGCCCTGGCCCAACCT AACTGGTGTGATTC GCGGCCGCTTTTTTCCTTGT
	Targeting-Test-F	GATGCCTGCCTGCCGTGCCTGTTCTGCC
	Targeting-Test-R	CTCCTCGCCCTTGCTCACCATGGTGG
NEURO D1	Insert-F	CACATCATGAGCGAGTCATGAGTGCCCAGCTCAATG CCATATTTATGAT AAAATTGTCGCTCCTGTCAA
	Insert-R	CCTGTTTCTTCCAAAGGCAGTAATGACAATAAATACA TATATCACTTGAA tcgacggagctcgaattc
	Retrieve-F	GATGGGGAAACTTCAGGAAGTTGAGATACCTAGATA TTTGCATTCTGTC ACTAGTGGATCCTCTAGAGT
	Retrieve-R	GATTCAGACAAGCGTTTTCAAAGAGAAGATGCAATG GGCCTGTGCTGAAC GCGGCCGCTTTTTTCCTTGT
	Targeting-Test-F	ACTGGTCGAGAATTTCTGTGGTCTTTGC
	Targeting-Test-R	CTCCTCGCCCTTGCTCACCATGGTGG
INS	Insert-F	aatgctgtaccagcatctgctccctctaccagctggagaactactgcaac AAAATTGTCGCTCCTGTCAA
	Insert-R	CTGAACAAGAAGTCACTTCTCAGTGGCCCCACCACC CCTGGCCCCTCAG tcgacggagctcgaattc
	Retrieve-F	ccttctcccactattgtttctggcctcgcccgaggaacagcaaggcag ACTAGTGGATCCTCTAGAGT

	Retrieve-R	GAGGCTGGAGGGAAAATGATGAGACCTTTTATGAGG ATGAGGCTAGAGGG GCGGCCGCTTTTTTCCTTGT
	Targeting-Test-F	GGATGGGGAGAAGTCAGGGGGATAGACA
	Targeting-Test-R	CTCCTCGCCCTTGCTCACCATGGTGG
Tdtm probe	Tdtm-probe-F	GTCATCAAAGAGTTCATGCGCTTC
	Tdtm-probe-R	CAGGAACAGGTGGTGGCGGCCCTCG