

### Supplementary Table 1

List of five overlapping genes. Five overlapping genes which were upregulated in all three RNA-Seq data (*Tert*-activated mouse cortical neurons, *Tert*-activated mouse hippocampal neurons from *R26-CAG-LSL-mTert*; *3xTg-AD*; *Camk2a-CreERT2* mouse brains, and *TERT*-activated human iPSC-derived *APP<sup>Dp</sup>* neurons) and also belonged to GO learning process.

Symbol	Name	Chr
<i>ATP1A3</i>	ATPase, Na <sup>+</sup> /K <sup>+</sup> transporting, alpha 3 polypeptide	7
<i>CHRN2</i>	cholinergic receptor, nicotinic, beta polypeptide 2 (neuronal)	3
<i>SLC12A5</i>	solute carrier family 12, member 5	2
<i>SNAP25</i>	synaptosomal-associated protein 25	2
<i>TBR1</i>	T-box brain gene 1	2

Supplementary Table 2

Primer sequences for RT-PCR

Name		Sequences (5'–3')
<i>Plat</i>	For	CTG AGG TCA CAG TCC AAG CA
	Rev	TCA GCC GGT CAG AGAAGAAT
<i>Serpine1</i>	For	GTC TTT CCG ACC AAG AGC AG
	Rev	GAC AAA GGC TGT GGA GGA AG
<i>Tert</i>	For	ACT CAG CAA CCT CCA GCC TA
	Rev	CAT ATT GGC ACT CTG CAT GG
<i>Kdm1a</i>	For	CGAATG ACC TCT CAG GAA GC
	Rev	GCT GGA GAG TGG CTT CAAAC
<i>Kdm4a</i>	For	CCA GAC TCA GAG GAC CAA GC
	Rev	CTA GGT ACG GGG TGG ACA GA
<i>Kdm4b</i>	For	TGT CTG TGG TCAAGC AGG AG
	Rev	GGC CTC AGG ATC AGT GAC AT
<i>Kdm4c</i>	For	CAC GGA GGA CAT GGA TCT CT
	Rev	TCA CAG CCT TGG GAG CTA CT
<i>Kdm4d</i>	For	TCA CCG ATT TAT GGT GCT GA
	Rev	TAT GCC ACA TTC CTG TTC CA
<i>Suv39h1</i>	For	CCT GCA CAA GTT TGC CTA CA
	Rev	GAC TAC ACG GTT TGG GCA GT
<i>Setdb1</i>	For	CAG ACA AAG AAG GCC TGG AG
	Rev	TCA GAG GAA GTG GGG ACA TC
<i>G9a</i>	For	TCA GGG CCT TCA CTG ACT CT
	Rev	GAT GAC CAA GGC TTT TTC CA
<i>App</i>	For	TCC GAG AGG TGT GCT CTG AA
	Rev	CCA CAT CCG CCG TAAAG AAT G
<i>ApoE</i>	For	CTC CCA AGT CAC ACAAGA ACT G
	Rev	CCA GCT CCT TTT TGT AAG CCT TT
<i>Hprt1</i>	For	AAG CTT GCT GGT GAA AAG GA
	Rev	TTG CGC TCA TCT TAG GCT TT
<i>TERT</i>	For	GCC CTC AGA CTT CAA GAC CA
	Rev	GCT GCT GGT GTC TGC TCT C
<i>SIRT1</i>	For	TCA GTG GCT GGAACA GTG AG
	Rev	AGC GCC ATG GAA AAT GTA AC
<i>BDNF</i>	For	TGG CTG ACA CTT TCG AAC AC
	Rev	AGA AGA GGA GGC TCC AAA GG
<i>PSD95</i>	For	CCG ACAAGT TTG GAT CCT GT

	Rev	CCC ATA GAG GTG GCT GTT GT
<i>HSF1</i>	For	CCA GCA ACA GAA AGT CGT CA
	Rev	GGC TAT ACT TGG GCA TGG AA
<i>HSP70-1</i>	For	CAA GAT CAC CAT CAC CAA CG
	Rev	TCG TCC TCC GCT TTG TAC TT
<i>NRF2</i>	For	GAG AGC CCA GTC TTC ATT GC
	Rev	TGC TCAATG TCC TGT TGC AT
<i>HO1</i>	For	ATG ACA CCA AGG ACC AGA GC
	Rev	GTG TAA GGA CCC ATC GGA GA
<i>HPRT1</i>	For	ACC CCA CGA AGT GTT GGA TA
	Rev	AAG CAG ATG GCC ACA GAA CT