

Number	Name	Sequence	Purpose	Source
SP533	GFP_for	GCACGACTTCTTCAAGTCCGCCAT	Genotyping	IDT
SP534	GFP_rev2	GCGGATCTTGAAGTTCACCTTGAT	Genotyping	IDT
SP154	FoxP1_gRNA1_for	GGAGTGAGGGCATCATTTGT	Genotyping	IDT
SP155	FoxP1_gRNA1_rev	GGTAAGGGAGGGAGGTAACG	Genotyping/TIDE	IDT
SP01	En1_gRNA4_for	GGAGAATTGTTGGAAGGGAGA	Genotyping	IDT
SP02	En1_gRNA4_rev	AGTAGATTTCCCTGTTGCTGG	Genotyping/TIDE	IDT

Table S1: Primer sequences used for PCR genotyping and TIDE analysis.

Target gene	Name	Sequence	Purpose	Source
FoxP1	FoxP1_gRNA1	ACTTGTGTAGACTAAGATTATGG	generating bilateral and unilateral mutants	Synthego
En1	En1_gRNA4	GCTCAGCAGTGAAGGCTGTTCGG	generating bilateral and unilateral mutants	Synthego

Table S2: Guide RNA sequences used to generate CRISPR mutants.

Metrics						
Model	Stage bin	Average distance	Visual recall	Visual Precision	OKS	mPCK
Centroid model	NF37-38	1.03709	1	1	0.94186	0.94395
	NF44-48	6.95001	1	1	0.54758	0.8125
	NF52-55	0.00001	1	1	0.92079	0.85714
	NF57-58	0.00001	1	1	0.47525	1
	NF59-62	0.00001	1	1	0.32673	1
	NF63-64	0.00001	1	1	0.76238	1
	Juvenile	0.00001	1	1	0.62376	1
Centered model	NF37-38	2.97621	0.98443	0.99751	0.34501	0.86163
	NF44-48	6.1345	0.93077	0.97059	0.10264	0.71244
	NF52-55	3.44924	0.93722	0.99524	0.33574	0.68918
	NF57-58	3.17561	0.94041	0.95863	0.5896	0.66311
	NF59-62	2.6415	0.99508	0.95997	0.77718	0.68521
	NF63-64	1.71405	0.99754	0.98901	0.81273	0.87478
	Juvenile	2.14075	0.99657	0.97865	0.88478	0.81674

Table S3: Metrics of the behavioral tracking models.

Gene to amplify	Step	PCR temperature	Time	Cycles
FoxP1	Initial denaturation	98 °C	30s	1
	Denaturation	98 °C	5s	32
	Annealing	57.7 - 63.3°C	5s	
	Extension	72 °C	10s	
	Final extension	72 °C	60s	1
	Storage	12 °C	∞	Storage
En1	Initial denaturation	98 °C	30s	1
	Denaturation	98 °C	5s	32
	Annealing	57.3 - 63.3°C	5s	
	Extension	72 °C	10s	
	Final extension	72 °C	60s	1
	Storage	12 °C	∞	Storage

Table S4: PCR conditions used for genotyping FoxP1 and En1 genes.