frontiers

Supplementary Material

Impact of an *SLC30A8* loss-of-function variant on the pancreatic distribution of zinc and manganese: laser ablation-ICP-MS and positron emission tomography studies in mice

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Table 1. Experimental parameters and data acquisition parameters used for LA-ICP-MS imaging.

	10 μm LA-ICP-MS	**4 μm LA-ICP-MS**	**NIST 612 Scans**
Teledyne Photon Machines Analyte Excite			
Energy density (J cm^2)	0.81	0.81	2.02
Repetition rate (Hz)	333	375	375
Scan speed (μm s^{-1})	333	100	1332/1000
Beam waist diameter (μm)	10 (circle)	3 (circle)	40 (circle)
Scanning mode	Fixed Dosage	Fixed Dosage	Fixed Dosage
Scanning direction	Uni-directional	Uni-directional	Uni-directional
Effective dosage (shots per position)	10	15	10/15
He Carrier gas flow rate (L min^{-1})	0.5	0.5	0.5
Thermo Fisher Scientific iCAP TQ ICP-mass spectrometer			
RF power (W)	1550	1550	1550
Ar plasma gas flow rate (L min -1)	14	14	14
Ar auxiliary gas flow rate (L min -1)	0.8	0.8	0.8
Nebuliser gas flow rate (L min -1)	1.03	1.03	1.03
He gas flow rate (L min-1)	3.25	3.25	3.25
Acquired m/z ratios (amu)	^{31}P, ^{55}Mn, ^{66}Zn	^{31}P, ^{66}Zn	^{31}P, ^{55}Mn, ^{66}Zn
Respective dwell times (ms)	2, 3.8, 19.4	10.4, 27.2	2, 3.8, 19.4 10.4, 27.2
Total scan cycle time (ms)	29	40	29/40

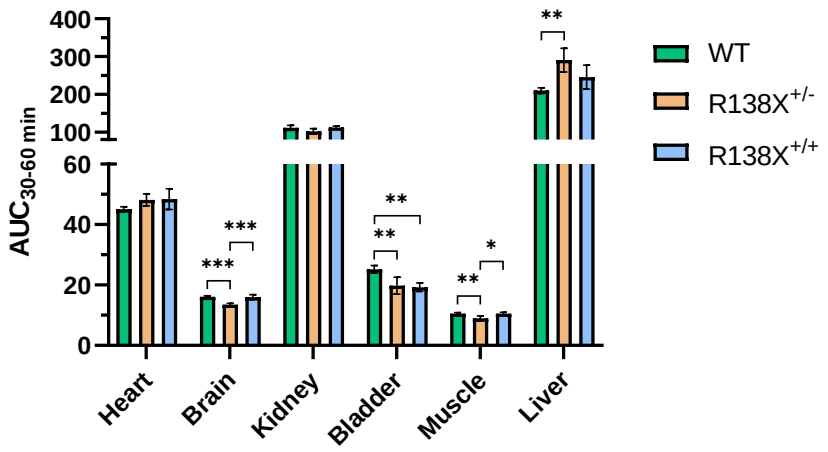

Figure S1 R138X mice demonstrate minor differences in zinc kinetics compared to WT mice by ^{62}Zn-PET quantification. AUC from 30 to 60 min p.i. were calculated for each subject (n = 4 mice per genotype) and analysed for significance using a one-way Anova with Tukey's *post-hoc* test for multiple comparisons, *, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$.

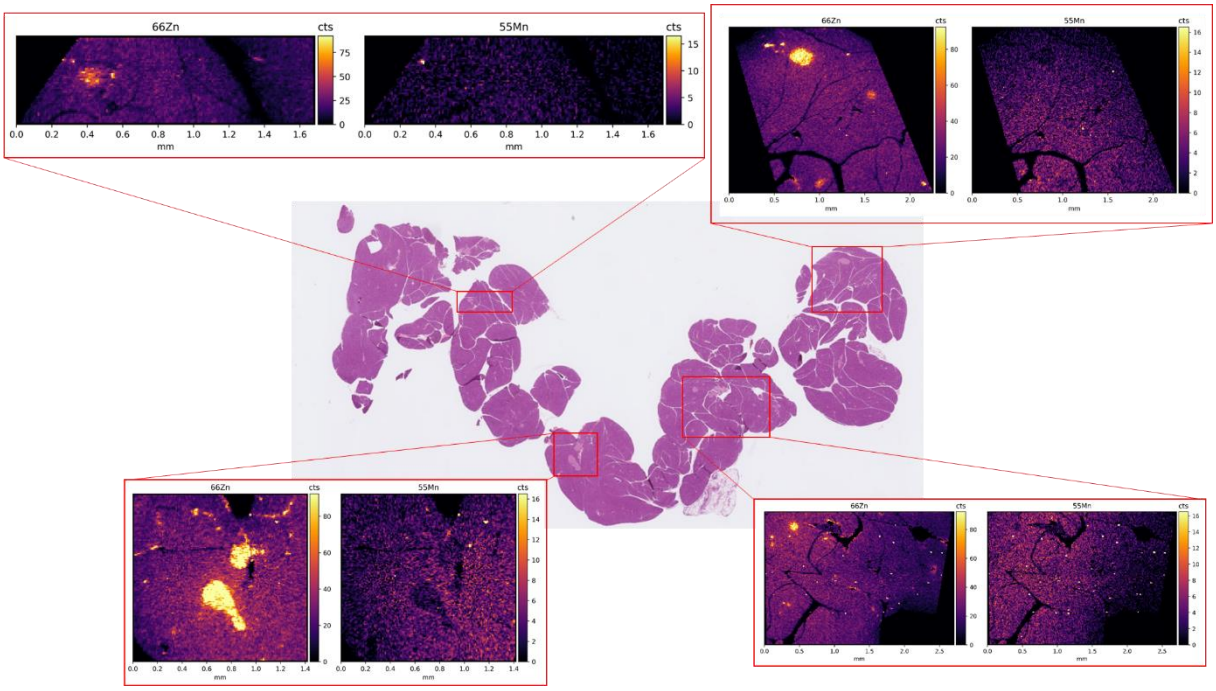

Figure S2 LA-ICP-MS of a pancreas from a wild-type mouse. ^{66}Zn and ^{55}Mn images are shown with ablated regions highlighted on a haemotoxylin and eosin-stained pancreas to visualise exocrine and islet tissue.

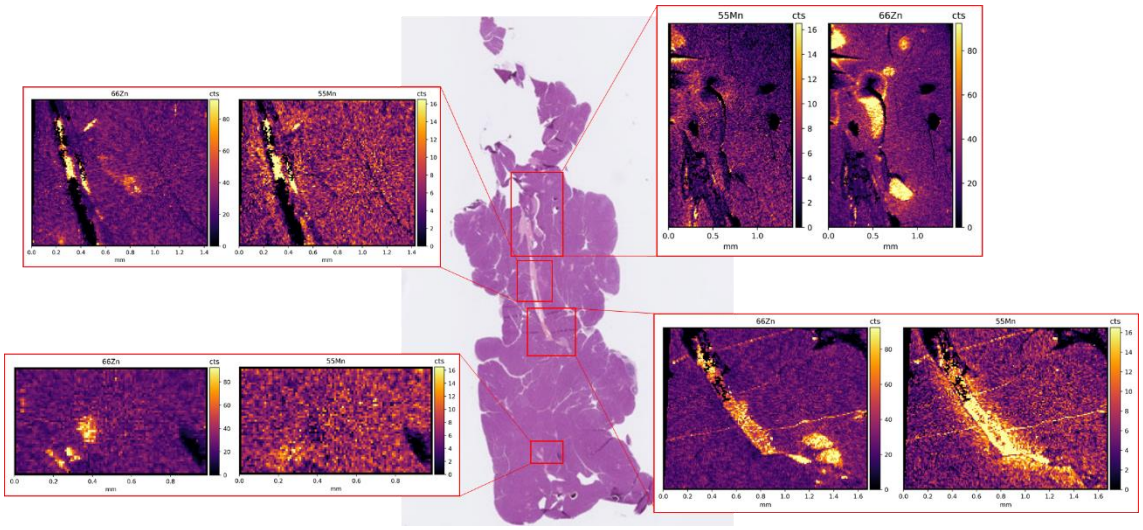

Figure S3 LA-ICP-MS of a pancreas from a heterozygous R138X mouse. ^{66}Zn and ^{55}Mn images are shown with ablated regions highlighted on a haemotoxylin and eosin-stained pancreas to visualise exocrine and islet tissue.

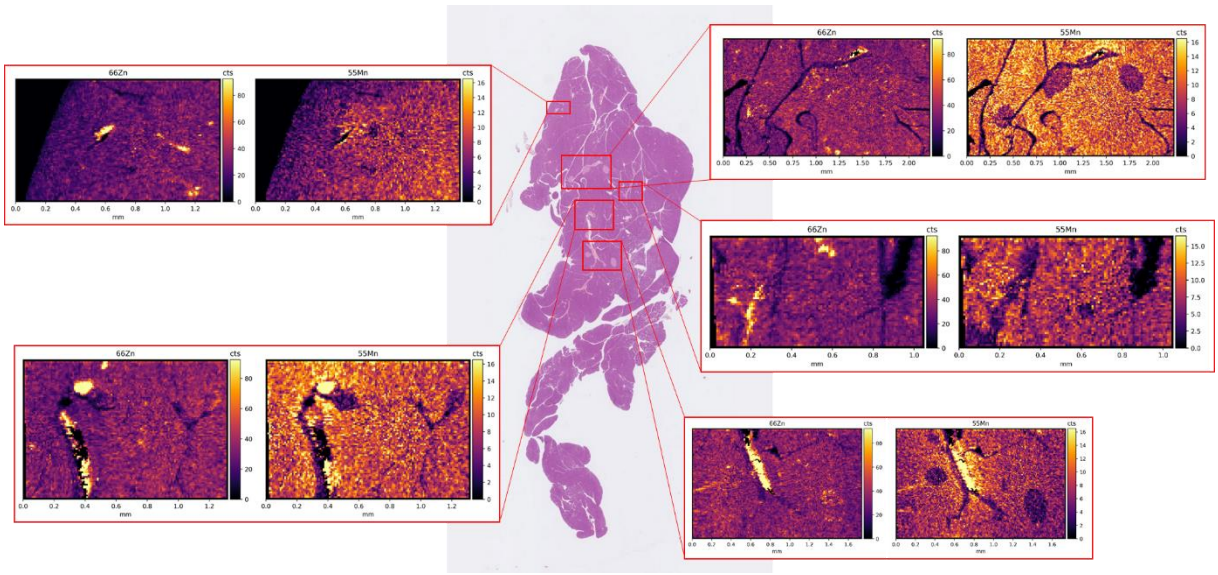

Figure S4 LA-ICP-MS of a pancreas from a homozygous R138X mouse. ^{66}Zn and ^{55}Mn images are shown with ablated regions highlighted on a haemotoxylin and eosin-stained pancreas to visualise exocrine and islet tissue.

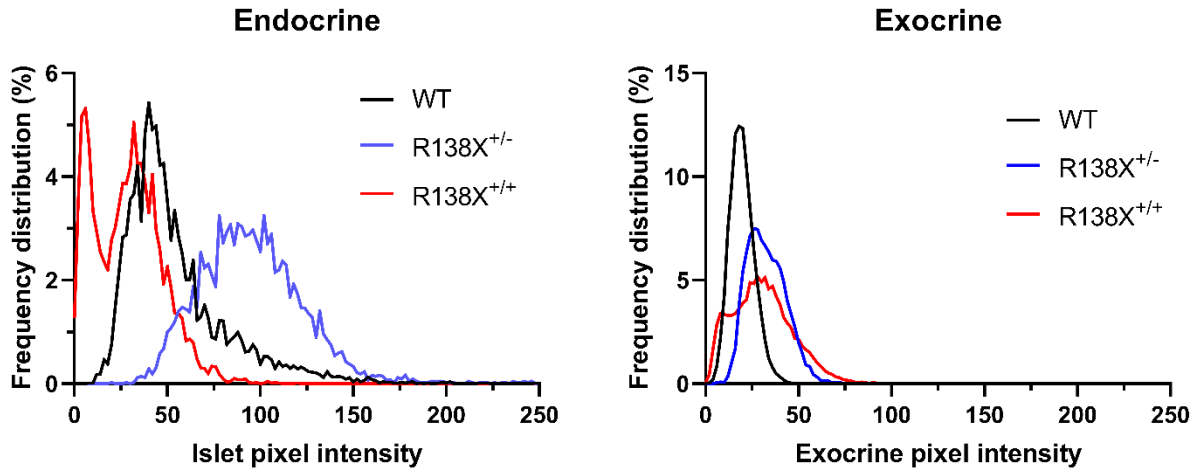

Figure S5 Zinc is heterogeneously distributed across the pancreas in R138X mice.
Frequency distributions with a bin width of 2.

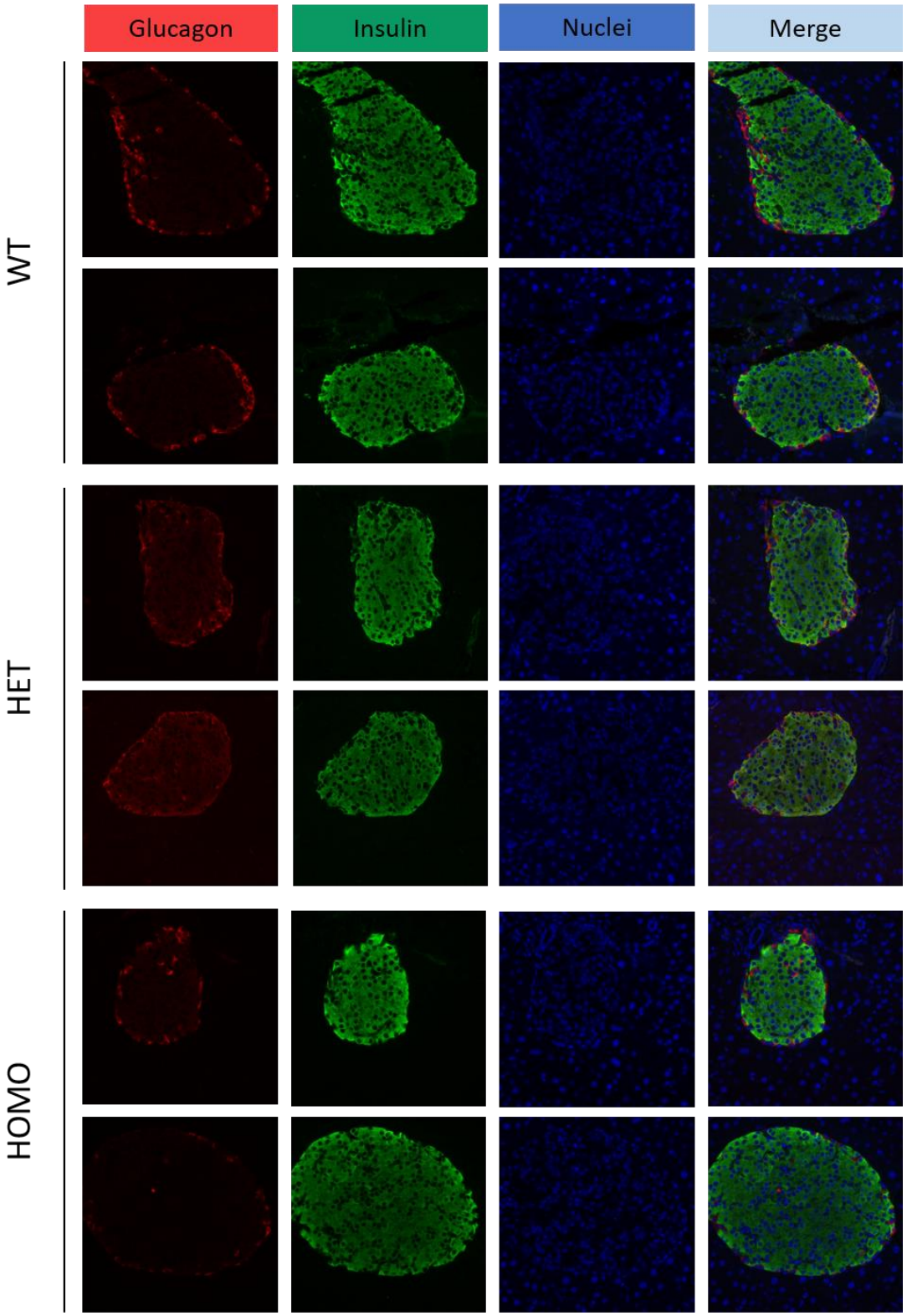

Figure S6 Histology of R138X and WT mouse islets. Histological sections (5 μm thick) of mouse pancreas were stained for islet hormones. All islets show the typical core-mantle arrangement of β and non-β cells. α cells, red; β cells, green; nuclei, blue.

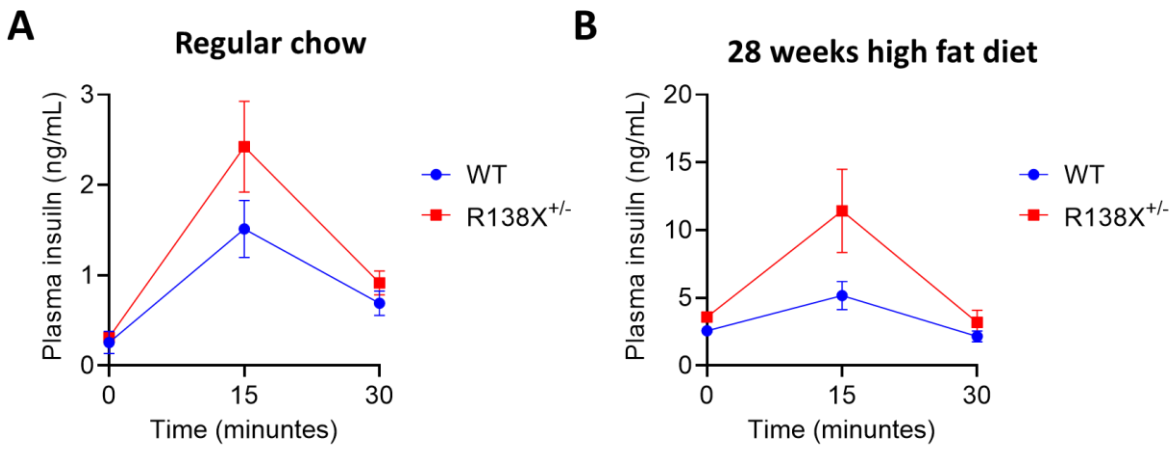

Figure S7. Glucose-stimulated insulin secretion in vivo. Insulin was measured at the indicated time points after injection of glucose (2 g/kg). Animals were maintained on regular chow (A) or on High Fat Diet (B). Other details are provided under Methods. No significant changes were detected by ANOVA.