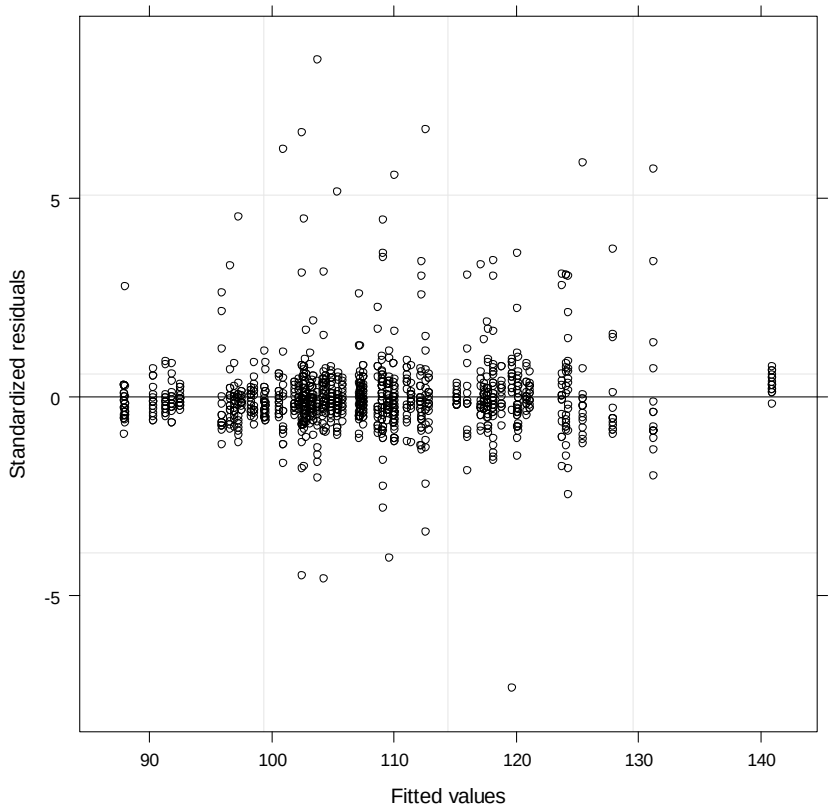
Supplementary data

Supplementary data I: Dataset information for each of the mutant-control comparisons.

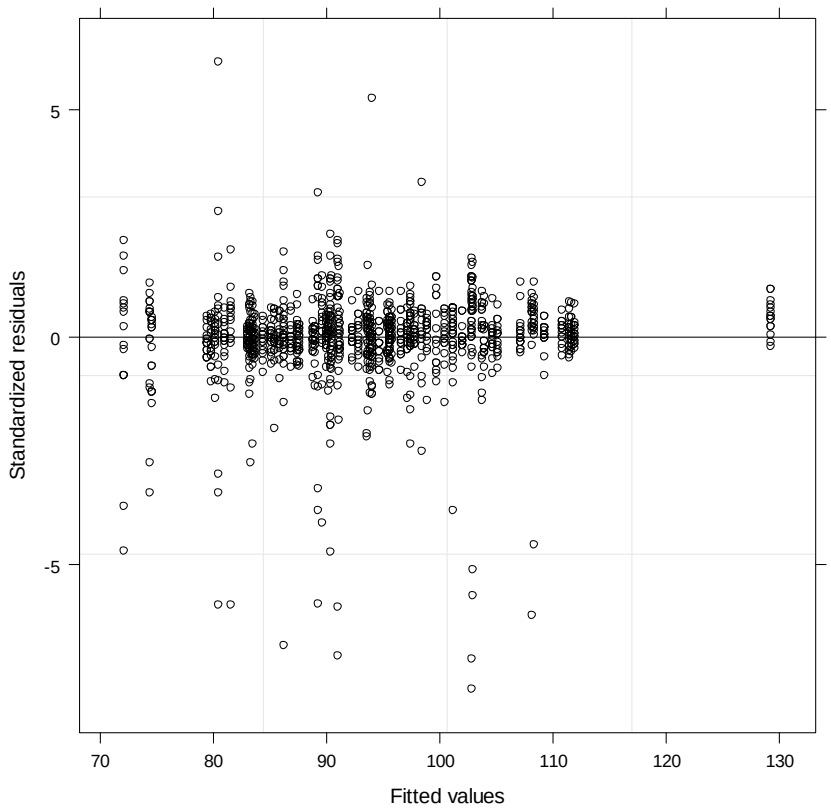
Gene	Allele	Mutant Group Genotype	Control Group Genotype	Strain	Gender	Number of mice		Number of days	
						Control	Mutant	Control	Mutant
Tpm1	*Tpm1<tm1aWtsi>*	HET	WT	129S5/SvEvBrd	female	10	10	4	4
					male	10	10	4	4
Brd7	*Brd7<tm1aWtsi>*	HET	WT	129S5/SvEvBrd	female	10	10	4	4
					male	10	10	4	4
Mta1	*Mta1<tm1aWtsi>*	HET	WT	129S5/SvEvBrd	male	20	10	4	4
					female	20	13	4	4
		HOM	WT	129S5/SvEvBrd	male	20	9	4	4
					female	20	6	4	4
Akt2	*Akt2<tm1Wcs>*	HOM	WT	129S5/SvEvBrd	male	15	14	4	4
					female	17	12	4	4
		HET	WT		female	17	5	4	4
Herc3	*Herc3<tm1a(EUCOMM)Wtsi>*	HOM	WT	C57BL/6NTacDen; C57BL/6-Tyr<c-Brd>	male	10	5	4	4
					female	9	6	4	4
Epc1	*Epc1<tm1aWtsi>*	HET	WT	129S5/SvEvBrd	male	10	9	4	4
					female	10	10	4	4
Baz1b	*Baz1b<tm1a(KOMP)Wtsi>*	HET	WT	C57BL/6NTacDen	male	15	6	4	4
					female	9	18	4	4
Mysm1	*Mysm1<tm1a(KOMP)Wtsi>*	HET	WT	C57BL/6NTacDen	male	8	10	4	4
					female	7	10	4	4
Tmc1	*Tmc1<dn>*	HOM	HET	Stock	female	11	17	4	4
Cadm1	*Cadm1<tm1.2Brd>*	HOM	WT	129S5/SvEvBrd; C57BL/6-Tyr<c-Brd>	male	11	11	4	4
					female	11	11	4	4
Matn3	*Matn3<tm1Brd>*	HOM	WT	129S5/SvEvBrd; C57BL/6-Tyr<c-Brd>	male	9	11	4	4
					female	11	12	4	4
Cdh23	*Cdh23<v>*	HOM	HET	Stock	female	10	9	4	4
Ube3b	*Ube3b<Gt(RRJ142)Byg>*	HET	WT	CBA/Wtsi; 129P2/OlaHsd	male	11	12	4	4
					female	7	11	4	4
Brd8	*Brd8<tm1a(EUCOMM)Wtsi>*	HET	WT	C57BL/6NTacDen; C57BL/6-Tyr<c-Brd>	male	12	11	4	4
					female	11	13	4	4
Mier1	*Mier1<tm1a(EUCOMM)Wtsi>*	HOM	WT	C57BL/6NTacDen;	male	10	10	4	4

				C57BL/6-Tyr<c-Brd>					
Epc2	*Epc2<tm1a(EUCOMM)Wtsi>*	HET	WT	C57BL/6NTacDen	male	10	10	4	4
					female	10	10	4	4
Impad1	*Impad1<tm1a(KOMP)Wtsi>*	HET	WT	C57BL/6NTacDen	male	7	13	4	4
					female	10	10	4	4
ApoE	*Apoe<tm1Unc>*	HOM	WT	C57BL/6NTacDen	male	10	10	3	3
					female	14	6	4	4
Rassf1	*Rassf1<tm1.2Brd>*	HOM	WT	129S5/SvEvBrd; C57BL/6-Tyr<c-Brd>	male	15	15	4	4
					female	15	15	4	4
Matn1	*Matn1<tm1Goe>*	HOM	WT	129S5/SvEvBrd; C57BL/6-Tyr<c-Brd>	male	10	8	4	4
					female	10	12	4	4
Magi2	*Magi2<tm1Grnt>*	HET	WT	129S5/SvEvBrd; 129P2/OlaHsd	male	10	9	4	4
					female	10	8	4	4
Ankrd13a	*Ankrd13a<Gt(RRH308)Byg>*	HOM	WT	CBA/Wtsi; 129P2/OlaHsd	male	8	10	4	4
					female	13	11	4	4
Mta3	*Mta3<tm1a(KOMP)Wtsi>*	HOM	WT	C57BL/6JWtsi; C57BL/6-Tyr<c-Brd>	male	20	14	4	4
					female	23	11	4	4

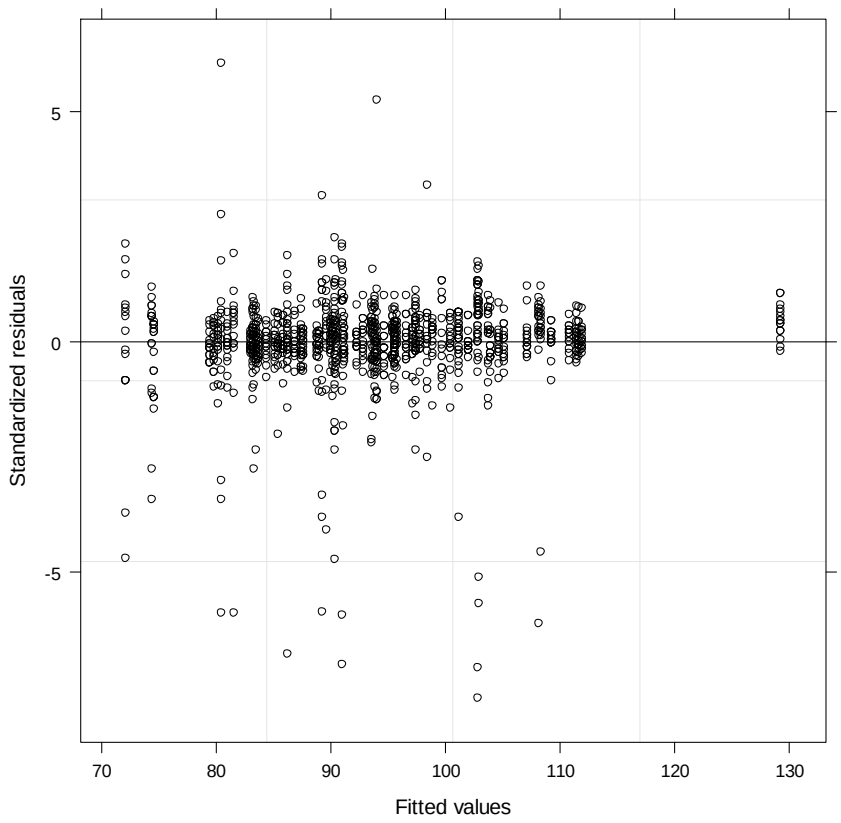
Supplementary data II: Example residual diagnostic plots obtained when fitting a linear model equivalent to a three-level nested ANOVA to NIBP data. A: systolic blood pressure (mmHg), B: diastolic blood pressure (mmHg) and C: heart rate (bpm). Examples shown are the residues obtained from a female *Tpm1*^{tm1aWtsi} heterozyote versus wildtype comparison.



A:


Standardized residuals
5
0
-5
70
80
90
100
110
120
130
Fitted values

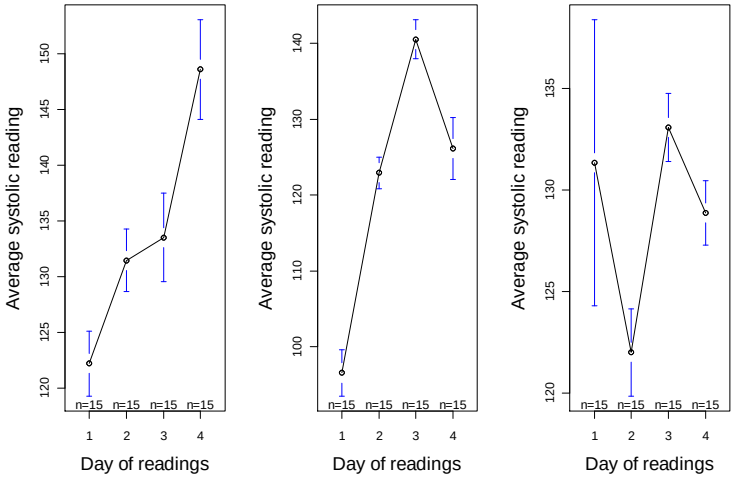
B


Standardized residuals
5
0
-5
70
80
90
100
110
120
130
Fitted values

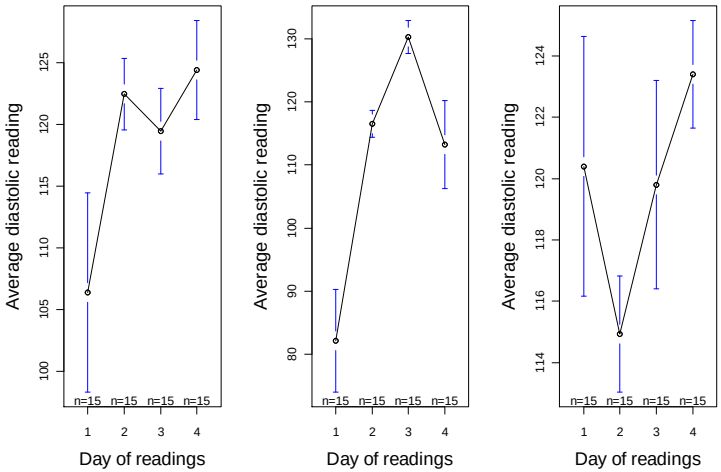
C

Supplementary data III: Example of the mean-time plot for each mouse that was used to assess for time dependent effects. For each graph set three representative male wildtype C57BL/6NTac (Taconic Denmark) mice are presented and demonstrate that no consistent pattern was seen. A: systolic blood pressure (mmHg), B: diastolic blood pressure (mmHg) and C: heart rate (bpm). The error bars represent the 95% confidence interval on the mean.

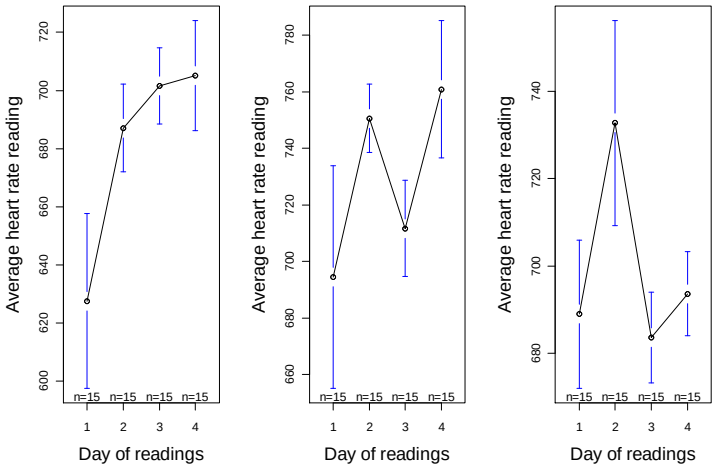
A



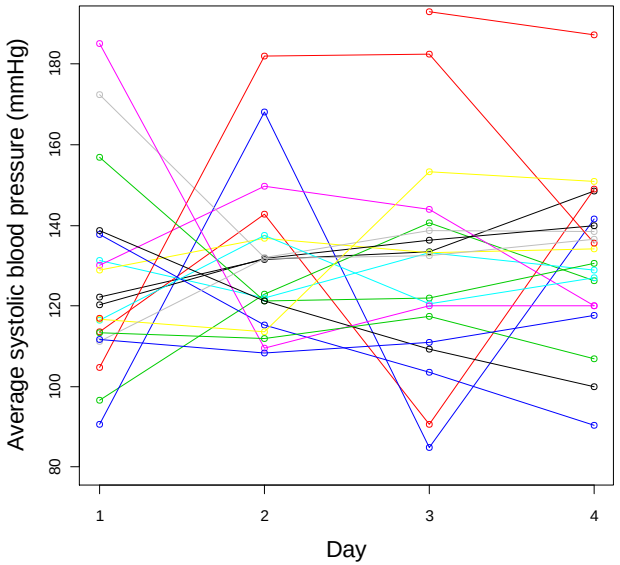
B



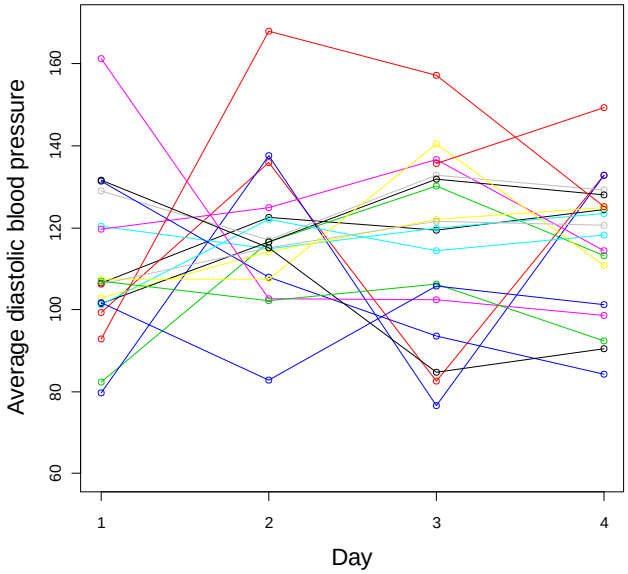
C


Average heart rate reading
600
620
640
660
680
700
720
n=15 n=15 n=15 n=15
1 2 3 4
Day of readings
Average heart rate reading
660
680
700
720
740
760
780
n=15 n=15 n=15 n=15
1 2 3 4
Day of readings
Average heart rate reading
680
700
720
740
n=15 n=15 n=15 n=15
1 2 3 4
Day of readings

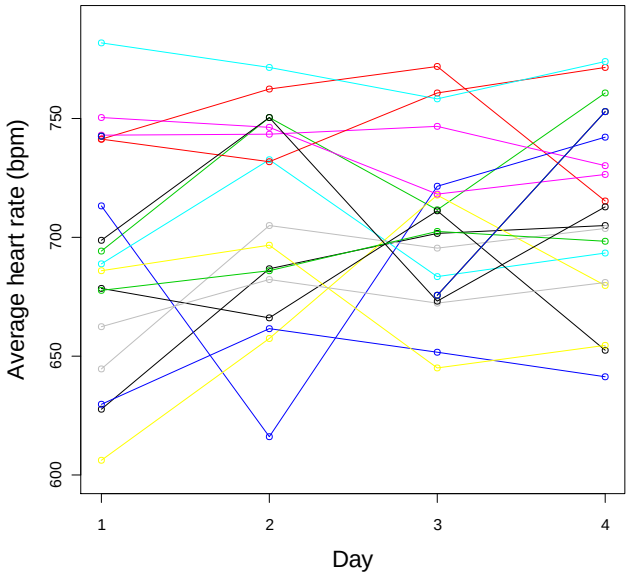
Supplementary data IV: A comparison of the mean reading for a day with time for twenty wildtype C57BL/6NTac (Taconic Denmark) male mice. A: systolic blood pressure (mmHg), B: diastolic blood pressure (mmHg) and C: heart rate (bpm).



A



B



C

Supplementary data V: The variability in the NIBP data was examined by estimating the proportion of variance between mice, days and readings for the 46 mutant wildtype datasets for the three parameters monitored by the NIBP procedure.

Allele	Mutant genotype	Gender	Diastolic blood pressure			Systolic blood pressure			Heart rate		
			Proportion of variance between			Proportion of variance between			Proportion of variance between		
			mice	days	readings	mice	days	readings	mice	days	readings
Tpm1	HET	female	0.81	0.17	0.03	0.85	0.12	0.03	0.86	0.12	0.02
		male	0.75	0.22	0.03	0.93	0.05	0.02	0.69	0.29	0.02
Brd7	HET	female	0.96	0.03	0.01	0.92	0.07	0.01	0.93	0.07	0.00
		male	0.88	0.11	0.01	0.88	0.11	0.01	0.88	0.11	0.01
Mta1	HET	male	0.92	0.07	0.01	0.84	0.11	0.04	0.95	0.04	0.00
		female	0.83	0.17	0.01	0.86	0.12	0.02	0.82	0.18	0.01
	HOM	male	0.88	0.11	0.01	0.87	0.08	0.04	0.92	0.08	0.00
		female	0.80	0.20	0.01	0.85	0.13	0.02	0.76	0.24	0.01
Akt2	HOM	male	0.69	0.29	0.01	0.70	0.30	0.00	0.86	0.11	0.03
		female	0.67	0.32	0.01	0.60	0.40	0.01	0.95	0.04	0.01
	HET	female	0.77	0.22	0.01	0.73	0.26	0.00	0.92	0.07	0.01
Herc3	HOM	male	0.59	0.40	0.01	0.62	0.37	0.01	0.83	0.14	0.03
		female	0.55	0.44	0.01	0.54	0.45	0.01	0.87	0.10	0.03
Epc1	HET	male	0.60	0.39	0.00	0.60	0.40	0.00	0.85	0.13	0.02
		female	0.50	0.49	0.01	0.55	0.45	0.00	0.80	0.19	0.02
Baz1b	HET	male	0.71	0.27	0.01	0.71	0.27	0.01	0.74	0.21	0.05
		female	0.59	0.40	0.01	0.64	0.35	0.01	0.85	0.12	0.03
Mysm1	HET	male	0.53	0.46	0.01	0.53	0.46	0.01	0.78	0.17	0.06
		female	0.82	0.18	0.00	0.82	0.18	0.00	0.63	0.33	0.04
Tmc1	HET v HOM	female	0.70	0.25	0.05	0.71	0.25	0.04	0.57	0.33	0.10
Cadm1	HOM	male	0.58	0.41	0.01	0.55	0.44	0.01	0.93	0.05	0.02
		female	0.82	0.17	0.01	0.77	0.23	0.00	0.86	0.11	0.02
Matn3	HOM	male	0.63	0.36	0.01	0.65	0.34	0.01	0.92	0.06	0.02
		female	0.72	0.28	0.00	0.94	0.05	0.01	0.94	0.05	0.01
Cdh23	HET v HOM	female	0.53	0.42	0.05	0.59	0.38	0.03	0.78	0.18	0.04
Ube3b	HET	male	0.64	0.34	0.02	0.64	0.34	0.02	0.82	0.14	0.04
		female	0.66	0.33	0.01	0.61	0.39	0.00	0.90	0.07	0.03
Brd8	HET	male	0.39	0.59	0.02	0.46	0.52	0.01	0.72	0.23	0.05
		female	0.67	0.32	0.01	0.69	0.30	0.01	0.85	0.12	0.03
Mier1	HOM	male	0.50	0.48	0.02	0.51	0.46	0.03	0.79	0.17	0.04

Epc2	HET	male	0.64	0.34	0.02	0.57	0.42	0.01	0.75	0.19	0.07
		female	0.66	0.33	0.01	0.66	0.33	0.01	0.75	0.19	0.06
Impad1	HET	male	0.80	0.20	0.01	0.81	0.19	0.00	0.71	0.20	0.09
		female	0.63	0.37	0.01	0.56	0.43	0.01	0.84	0.12	0.04
ApoE	HOM	male	0.66	0.33	0.01	0.57	0.40	0.03	0.73	0.19	0.08
		female	0.52	0.47	0.01	0.53	0.46	0.01	0.83	0.12	0.04
Rassf1	HOM	male	0.80	0.18	0.01	0.75	0.24	0.01	0.96	0.03	0.01
		female	0.79	0.19	0.02	0.85	0.14	0.00	0.91	0.07	0.02
Matn1	HOM	male	0.51	0.48	0.01	0.55	0.45	0.00	0.90	0.09	0.01
		female	0.82	0.18	0.01	0.80	0.20	0.00	0.94	0.05	0.01
Magi2	HET	male	0.53	0.45	0.01	0.54	0.45	0.01	0.99	0.01	0.00
		female	0.53	0.46	0.01	0.49	0.50	0.01	0.77	0.21	0.02
Ankrd13a	HOM	male	0.71	0.27	0.02	0.62	0.37	0.01	0.89	0.08	0.03
		female	0.73	0.24	0.02	0.67	0.30	0.03	0.80	0.14	0.05
Mta3	HOM	male	0.80	0.19	0.01	0.79	0.21	0.01	0.87	0.11	0.02
		female	0.82	0.16	0.01	0.82	0.18	0.01	0.83	0.15	0.02

Supplementary data VI: Significance score for the various mutant-wildtype datasets examined for the three parameters collected during NIBP.

Allele	Mutant genotype	Gender	*p* value significance score for assessing the genotype effect		
			Systolic blood pressure	Diastolic blood pressure	Heart rate
Tpm1	HET	female	0.7540	0.0996	0.0366
		male	0.9339	0.9633	0.2478
Brd7	HET	female	0.1455	0.2312	0.3337
		male	0.7813	0.7073	0.0058
Mta1	HET	male	0.2274	0.3324	0.0328
		female	0.8545	0.0178	0.0021
	HOM	male	0.8545	0.2763	0.0009
		female	0.8140	0.9501	0.0035
Akt2	HOM	male	0.0890	0.2945	0.0007
		female	0.8254	0.8317	0.6310
	HET	female	0.0193	0.0223	0.8517
Herc3	HOM	male	0.3740	0.4859	0.0250
		female	0.0870	0.1210	0.0400
Epc1	HET	male	0.0114	0.0083	0.0051
		female	0.6989	0.9791	0.0052
Baz1b	HET	male	0.6153	0.6153	0.0412
		female	0.6156	0.5319	0.0235
Mysm1	HET	male	0.0064	0.0054	0.4541
		female	0.1410	0.1320	0.2224
Tmc1	HET v HOM	female	0.2489	0.5427	0.0007
Cadm1	HOM	male	0.7723	0.5518	0.5262
		female	0.1796	0.1247	0.0003
Matn3	HOM	male	0.5851	0.4665	0.9827
		female	0.6989	0.7840	0.0903
Cdh23	HET v HOM	female	0.0498	0.9849	0.0013

Ube3b	HET	male	0.3706	0.2972	0.8509
		female	0.5626	0.7620	0.6337
Brd8	HET	male	0.7910	0.8550	0.2940
		female	0.7900	0.9490	0.6860
Mier1	HOM	male	0.5190	0.4510	0.1390
Epc2	HET	male	0.9455	0.6135	0.1358
		female	0.4099	0.3680	0.1043
Impad1	HET	male	0.4590	0.4244	0.6674
		female	0.8223	0.9111	0.1280
ApoE	HOM	male	0.1818	0.1004	0.4269
		female	0.2070	0.0889	0.1218
Rassf1	HOM	male	0.4045	0.5455	0.3831
		female	0.4523	0.5700	0.5543
Matn1	HOM	male	0.8435	0.8188	0.9212
		female	0.5764	0.9644	0.2213
Magi2	HET	male	0.0115	0.0469	0.5616
		female	0.9817	0.7857	0.3205
Ankrd13a	HOM	male	0.1140	0.9824	0.4713
		female	0.0613	0.5064	0.5287
Mta3	HOM	male	0.0637	0.0281	0.1298
		female	0.4686	0.5623	0.0127

Supplementary VII: A graphical display of the relationship between *p* and *q* values for this set of experiments. The *p* value is a measure of significance in terms of the false positive rate and focuses on the test in isolation; the *q* value is a measure in terms of the false discovery rate across all the statistical tests within one experimental family. The *q* value is defined as the expected proportion of false positives incurred when making a call that this test and all other more significant changes are statistically significant.