

## SUPPLEMENTARY MATERIAL

**Table S1.** Least-squares means and standard errors from analyses of all mice as presented in Table 1.

Trait	High Runner Lines				Control Lines				Mini-Muscle			
	Sedentary		Active		Sedentary		Active		Sedentary		Active	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
log Body Mass (g)	1.45	0.02	1.44	0.02	1.52	0.02	1.48	0.02	1.47	0.01	1.48	0.02
log Body Mass <sup>a</sup> (g)	1.46	0.01	1.44	0.01	1.49	0.02	1.47	0.02	1.47	0.01	1.46	0.02
log Snout Rump (mm)	2.01	0.00	2.01	0.00	2.02	0.00	2.02	0.00	2.01	0.00	2.02	0.00
BMI <sup>b</sup> (kg/m <sup>2</sup> )	2.70	0.08	2.59	0.09	3.00	0.10	2.81	0.10	2.81	0.05	2.74	0.10
log Soleus (mg)	0.97	0.02	0.98	0.02	0.97	0.02	0.96	0.02	0.90	0.01	1.04	0.02
log Plantarus (mg)	1.12	0.02	1.13	0.02	1.14	0.02	1.15	0.02	1.16	0.01	1.11	0.02
log Gastroc (mg)	1.87	0.01	1.87	0.01	1.88	0.01	1.89	0.01	2.07	0.01	1.68	0.02
log Fat Pad (mg)	2.73	0.06	2.64	0.07	2.66	0.08	2.58	0.08	2.60	0.04	2.71	0.08
log Ventricle (mg)	2.12	0.01	2.17	0.01	2.10	0.01	2.12	0.01	2.12	0.01	2.15	0.01
log Spleen (mg)	1.97	0.03	1.94	0.04	2.02	0.04	2.02	0.04	1.94	0.02	2.03	0.04
log Liver (mg)	3.18	0.01	3.20	0.01	3.20	0.01	3.19	0.01	3.17	0.01	3.21	0.01
log Kidney (mg)	2.63	0.01	2.67	0.02	2.64	0.02	2.66	0.02	2.63	0.01	2.68	0.02
log Lungs (mg), wet	2.35	0.01	2.36	0.02	2.31	0.02	2.34	0.02	2.32	0.01	2.36	0.02
dry	1.65	0.01	1.66	0.01	1.62	0.02	1.63	0.02	1.62	0.01	1.66	0.02
log Stomach (mg), wet	2.53	0.01	2.53	0.01	2.55	0.01	2.54	0.01	2.52	0.01	2.55	0.01
dry	1.83	0.01	1.83	0.01	1.85	0.01	1.85	0.01	1.82	0.01	1.85	0.01
log Sm Intes (mg), wet	3.35	0.02	3.38	0.02	3.37	0.02	3.39	0.02	3.36	0.01	3.38	0.02
dry	2.53	0.01	2.55	0.01	2.54	0.01	2.56	0.01	2.54	0.01	2.55	0.01
log Sm Intes Lth (cm)	1.68	0.01	1.71	0.01	1.68	0.01	1.70	0.01	1.68	0.01	1.71	0.01
log Cecum (mg), wet	2.41	0.02	2.35	0.02	2.41	0.03	2.41	0.02	2.37	0.01	2.42	0.03
dry	1.64	0.03	1.59	0.03	1.59	0.04	1.62	0.03	1.58	0.02	1.65	0.04
log Lg Intes (mg), wet	2.61	0.01	2.65	0.01	2.60	0.02	2.61	0.02	2.61	0.01	2.63	0.02
dry	1.97	0.02	2.00	0.02	1.95	0.02	1.95	0.02	1.95	0.01	1.99	0.02
log Lg Intes Lth (cm)	0.98	0.01	1.00	0.01	0.96	0.01	0.95	0.01	0.98	0.01	0.97	0.01
Hematocrit (%)	0.45	0.00	0.47	0.00	0.45	0.01	0.45	0.01	0.45	0.00	0.45	0.01
no mass	0.45	0.00	0.47	0.00	0.44	0.01	0.45	0.01	0.45	0.00	0.45	0.01
<i>Ventricle</i>												
Citrate Synthase	300.45	10.13	311.65	10.93	272.95	13.19	291.89	12.19	302.05	5.38	286.43	13.21

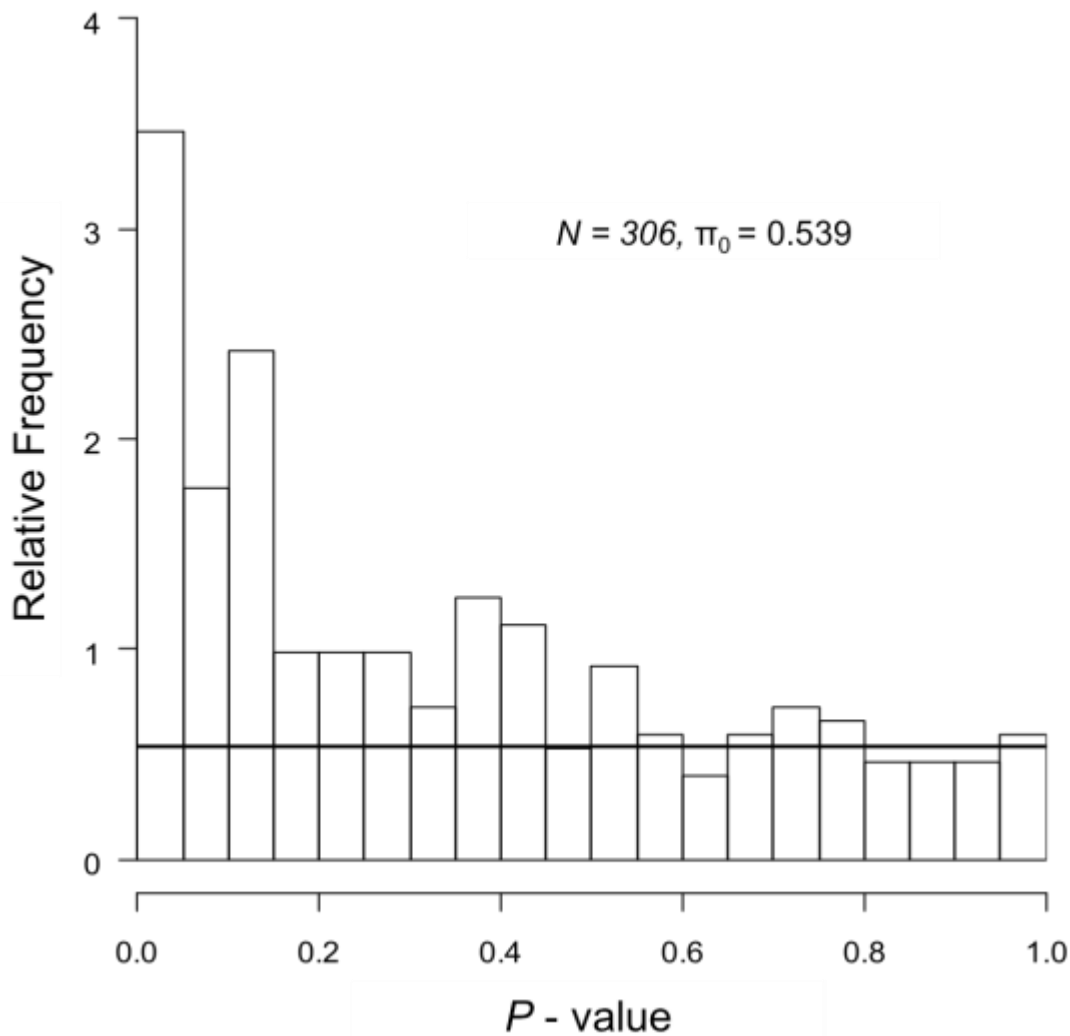
no mass	296.27	10.08	306.43	10.76	282.85	12.18	294.04	12.54	301.42	5.63	288.38	13.71
Myoglobin	5.56	0.11	5.52	0.12	5.14	0.14	5.20	0.13	5.50	0.06	5.21	0.14
no mass	5.51	0.12	5.44	0.12	5.25	0.14	5.21	0.14	5.49	0.06	5.22	0.15
<i>Gastrocnemius</i>												
Citrate Synthase	87.35	6.60	113.27	6.82	79.46	8.25	86.47	7.76	70.93	3.52	112.34	8.05
no mass	85.58	6.73	110.35	6.85	83.56	8.04	86.82	8.09	70.81	3.87	112.34	8.62
Myoglobin	1.42	0.06	1.74	0.06	1.36	0.08	1.48	0.07	1.01	0.03	1.99	0.08
no mass	1.41	0.06	1.72	0.06	1.39	0.07	1.49	0.07	1.01	0.03	1.99	0.08

<sup>a</sup>Snout–rump length as the covariate for analysis of body mass.

<sup>b</sup>BMI (kg/m<sup>2</sup>) is body mass index.



**Fig. S1. Cages with and without wheels placed alternately on racks.** Four groups were compared: mice from C lines housed without wheels (sedentary,  $N = 24$ ); mice from C lines housed with wheels (active,  $N = 24$ ); mice from HR lines housed without wheels (sedentary,  $N = 24$ ) and mice from HR lines housed with wheels (active,  $N = 24$ ).



**Fig. S2. Distributions of  $P$  values in relation to the  $\pi_0$  statistic.** The overall proportion of true null hypotheses (Storey and Tibshirani, 2003; Storey, 2003) for a subset of the  $P$ -values in Tables 1-3 (see text). The bin size is 0.05;  $\pi_0$  is indicated by the solid line. A random set of  $P$ -values would produce a flat histogram with all bins showing a relative frequency of 1.0; the presence of non-null hypotheses (i.e., significant tests after accounting for Type 1 errors) are indicated by high relative frequencies in the left-most bin. Values of  $\pi_0$  were computed with the *qvalue* software package for R.