SUPPLEMENTAL DATA

Table S1. Statistical analysis of survivors for dEFsec KO flies on the chemically defined food supplemented with different selenium concentrations.

1. Panel in Fig. 2	2. Genotype (Sex)	3. Mean for 0 nM Se, days	4. Mean for 100 nM Se, days	5. % *vs.* 100 nM Se	6. χ^2	7. $p > \chi^2$	8. Column 4 *vs.* column 4 in Table 1, %
C	Wild type (F)	30.2	31.5	-4	2.39	0.1217	-29
C	KO #24 (F)	34.8	36.1	-4	9.77	0.0018	-26
C	KO #46 (F)	25.4	27.2	-7	5.23	0.0121	-32
D	Wild type (M)	30.0	30.5	+0	0.51	0.3524	-34
D	KO #24 (M)	36.2	35.4	+2	6.35	0.0267	-28
D	KO #46 (M)	25.2	24.8	+2	0.36	0.4215	-44

Column 1 indicates the letter of the corresponding panel in Fig. 2. The genotypes and genders (female, F; male, M) are shown in column 2. The mean lifespan of flies on the chemically defined diet supplemented with or without 100 nM selenium is shown in column 3 or 4, respectively. The percent change in the mean lifespan for flies on the diet without selenium *versus* that of flies on the diet supplemented with 100 nM selenium is displayed in column 5. Statistics of non-parametrical log rank test (χ^2) performed in SAS for comparison between survivor flies on diet without Se supplementation (column 3) *versus* that on the diet supplemented with 100 nM Se (column 4) is shown in column 6; *p*-value in column 7. Column 8 represents the percent change in the mean lifespan on chemically defined food (column 4) against the mean lifespan on corn meal food for flies with the same genotype (column 4, Table 1).

Table S2. Statistical analysis of survivors for MsrB1-expressing flies maintained on the chemically defined diet supplemented with different selenium concentrations.

1. Panel in Fig. 2	**2. Gender**	**3. Se, nM**	**4. Mean, days**	**5. % *vs.* 207 nM Se**	**6. χ^2**	**7. $p > \chi^2$**	**8. Column 4 *vs.* column 4 in Table 3, %**
A	F	13	67.5	+2	0.52	0.4719	+1
A	F	20	63.3	-5	5.02	0.0251	-6
A	F	207	66.3				-1
B	M	13	66.2	+9	19.11	<0.0001	+11
B	M	20	63.3	+4	6.18	0.0130	+6
B	M	207	60.6				+2

Column 1 indicates the letter of the corresponding panel in Fig. 8. The gender of *da-GAL4/mMsrB1*^{3B} flies is shown in column 2; selenium concentration in column 3. The mean lifespan is presented in column 4. The percent change in the mean lifespan for flies on the diet with 13 nM or 20 nM selenium *versus* that of flies on the diet supplemented with 207 nM sodium selenite is displayed in column 5. Statistics of non-parametrical log rank test (χ^2) performed in SAS for comparison between survivor flies on diet with 13 nM or 20 nM selenium *versus* that on the diet supplemented with 207 nM selenium is shown in column 6; *p*-value in column 7. Column 8 represents the percent change in the mean lifespan on the chemically defined food (column 4) against the mean lifespan on corn meal food for the same flies (column 4, Table 1).

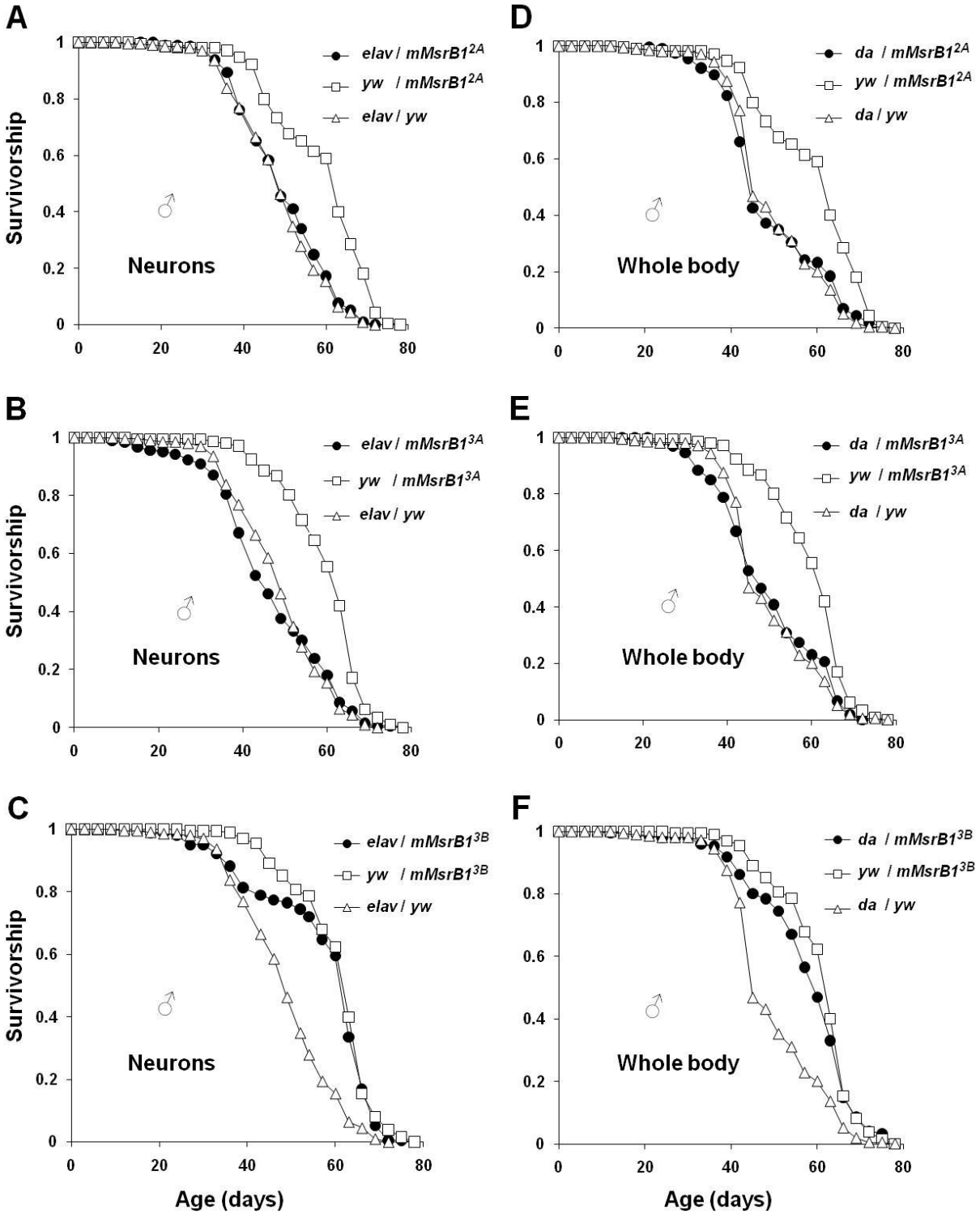

Figure S1. Survivorship curves of mMsrB1-expressing virgin males on corn meal food. Expression of mMsrB1 in the nervous system was activated by *elav-GAL4* activator line (A-C) and in the whole body by *da-GAL4* activator line (D-F). Each survivorship curve represents approximately 210 virgin male flies. Genotypes and genders are shown on the plot. All trials were performed concurrently.

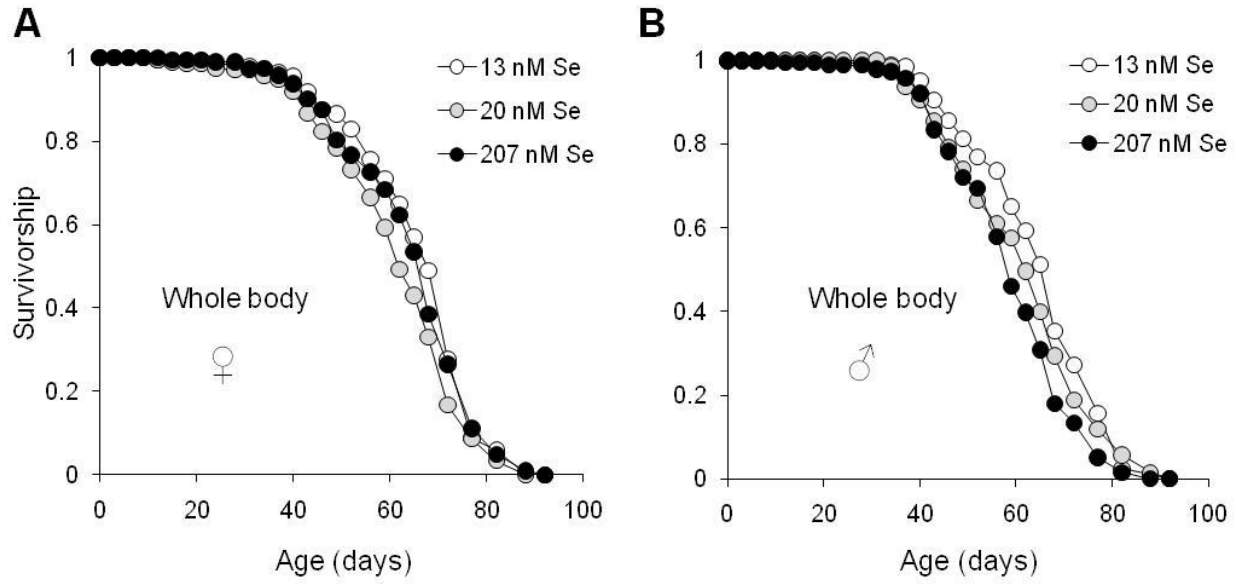

Figure S2. Survivorship curves of mMsrB1-expressing flies on the chemically defined diet with different selenium concentrations. Virgin female flies with genotype *da-GAL4/mMsrB1*^{3B} (A) and virgin male flies *da-GAL4/mMsrB1*^{3B} (B) were kept on the chemically defined diet supplemented with 0, 10 or 200 nM sodium selenite (actual selenium concentrations in the diets are shown in the figure). Each survivorship curve represents approximately 210 flies. Genders and selenium concentration are shown on the plot. All trials were performed concurrently.