

SUPPLEMENTAL TABLES

Supplemental Table S1. Survival (Life Table) Summary for Longevity-Mutant Strains

Strain	Genotype	Median Adult Lifespan (d)	Rel. Median Lifespan	Mean Adult Lifespan (d) ±SEM	Rel. Mean Lifespan	N (deaths counted)	C (worms censored)	Diff. from N2, Cox-Mantel log-rank P<
N2DRM	a wild type	18.0	0.97	17.9±0.8	0.98	31	4	—
	b	19.0	1.03	18.7±0.8	1.02	22	13	
SR803	a <i>old-1(zls3000)</i>	19.0	1.03	19.3±0.7	1.05	33	2	N.S.
	b	19.0	1.03	18.9±0.7	1.03	31	4	
SR801	a <i>eat-18(ad820)</i>	21.0	1.14	20.5±0.8	1.12	26	7	0.04
	b	21.0	1.14	19.6±0.8	1.07	25	10	
SR800	a <i>unc-31(e928)</i>	21.0	1.14	24.8±2.3	1.36	14	20	0.001
	b	23.5	1.27	24.6±1.4	1.34	22	12	
SR806	a <i>daf-2(e1370)</i>	41.9	2.26	37.8±2.0	2.07	29	5	<1E-10
	b	41.9	2.26	39.5±1.7	2.16	29	6	
SR807	a <i>age-1(hx546)</i>	30.1	1.63	29.9±1.5	1.63	31	4	<1E-10
	b	30.1	1.63	30.4±1.2	1.66	33	2	
N2DRM	a wild type*	15.5	0.95	15.1±0.6	0.94	36	6	—
	b	17.3	1.05	17.2±0.7	1.06	33	8	
SR808	a <i>age-1(mg44)*</i>	150.4	9.2	136.4±16.3	8.5	15	33	<1E-15
	b	161.6	9.9	170.2±12.0	10.5	14	42	
N2DRM	a wild type	17.5	0.94	17.2±0.9	0.99	27	3	—
	b	19.6	1.06	17.5±1.0	1.01	29	1	
SR807	a <i>age-1(hx546)</i>	33.5	1.81	27.8±1.8	1.60	21	8	<1E-4
	b	26.5	1.43	28.2±1.2	1.63	21	9	
SR819	a <i>age-1hx546</i> ;	19.6	1.06	17.8±0.8	1.03	28	2	N.S.
	b <i>daf-16(mu26)</i>	19.6	1.06	19.3±0.6	1.11	25	5	
SR820	a <i>age-1mg44</i> ;	19.6	1.06	18.5±0.9	1.07	28	2	0.04
	b <i>daf-16(mu26)</i>	19.6	1.06	19.5±0.6	1.12	27	3	

Relative median and relative mean adult lifespans are ratios of each group's value over the mean of N2DRM controls.

Data from duplicate experiments were combined prior to testing of significance. *Data from [7]. N.S., not significant.

Supplemental Table S2. Survival (Life Table) Summary for N2DRM Worms Exposed to RNAi

RNAi Added	Median Adult Lifespan (days at 20°C)	Mean Adult Lifespan (days) ±SD	Relative Lifespan (Mean/N2)	N (deaths counted)	C (worms censored)	Diff. from N2: Cox-Mantel log-rank P<
Feeding Vector	18.7	19.6±0.7	—	21	14	--
<i>elo-1</i>	22.0	21.8±0.6	1.11	27	8	0.02
<i>elo-2</i>	20.1	21.3±0.8	1.09	28	7	0.04
<i>elo-5</i>	18.5	20.2±0.6	1.03	24	11	N.S.
<i>fat-4</i>	24.6	24.5±0.7	1.25	26	8	4E-5
<i>elo-1 + elo-2</i>	21.5	22.5±0.9	1.15	26	9	0.004
<i>fat-6 + fat-7</i>	22.4	23.2±0.9	1.18	23	12	0.001
<i>elo-1 + elo-4</i>	22.2	21.9±0.7	1.12	26	9	0.006

Supplemental Table S3a. Fatty acid composition of isogenic *C. elegans* strains of varying lifespan

(N.B.: double-mutant control strains, not shown here, were included to determine correlation coefficients)

Median Lifespan:		~1X	1	1.14X	1.21X	1.63X	2.3X	9.6X	Pearson		Pearson		Rank-Order	
Genotype:		<i>old-1(zls3000)</i>	Wild Type	<i>eat-18(ad820)</i>	<i>unc-31(e928)</i>	<i>age-1(hx546)</i>	<i>daf-2(e1370)</i>	<i>age-1(mg44)</i>	Correlation v.		Correlation v.		Correlation	
Strain (Biol. N):		SR803 (2)	N2DRM (5)	SR801 (2)	SR800 (2)	SR807 (5)	SR806 (3)	SR808 (4)	logLS (N=10)		logLS (N=36)		v. LS (N=36)	
		Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	R	P _R ≤	R	P _R ≤	R _S	P _R ≤
immBC	C15:0 iso	3.6 0.0	4.1 0.5	2.4 0.3	3.6 0.8	3.9 0.6	4.4 1.3	4.7 1.3	0.63	0.06	0.41	0.02	0.23	—
	C17:0 iso	5.2 0.02	5.8 0.5	3.7 0.1	4.3 0.2	5.3 0.6	5.1 0.2	5.1 0.8	-0.07	—	-0.18	—	-0.21	—
SATURATED FAs	C14:0	0.9 0.1	1.0 0.2	1.3 0.05	1.1 0.2	1.0 0.2	1.5 0.6	3.0 1.3	0.96	1E-5	0.82	1E-9	0.53	8E-4
	C16:0	4.0 0.2	3.8 0.6	4.5 0.4	4.6 1.5	4.0 0.2	4.7 1.0	4.8 0.6	0.67	0.04	0.47	0.004	0.45	0.007
	ΣSC-SFAs (C14-C16)	8.4 0.3	8.9 1.0	8.3 0.1	9.3 2.6	8.9 0.8	10.6 2.9	12.7 2.7	0.96	2E-5	0.68	5E-6	0.42	0.01
	C18:0	10.47 0.8	9.8 1.9	11.2 0.2	11.6 1.9	10.3 0.7	9.4 2.3	6.5 1.7	-0.75	0.02	-0.57	3E-4	-0.23	—
	C20:0	4.0 0.1	3.3 1.0	4.1 0.3	4.7 1.2	3.5 1.7	2.7 0.9	1.5 0.8	-0.81	0.005	-0.52	0.001	-0.40	0.02
	C22:0	1.0 0.1	0.9 0.3	1.1 0.2	1.0 0.2	1.0 0.3	0.8 0.1	0.5 0.1	-0.91	3E-4	-0.60	1E-04	-0.43	0.01
	ΣLC-SFAs (C18-C22)	15.4 1.0	14.0 2.8	16.4 0.3	17.3 3.3	14.7 2.6	12.9 2.8	8.5 2.4	-0.80	0.006	-0.60	1E-04	-0.34	0.05
MUFAs	C16:1Δ9(n-7)	2.8 0.1	2.7 0.4	2.4 0.1	2.8 0.2	2.2 0.9	4.2 0.9	10.6 1.6	0.95	3E-5	0.93	7E-16	0.53	0.001
	C18:1Δ11(n-7)	25.6 0.7	27.7 6.0	21.7 0.7	22.2 1.8	24.3 3.0	28.4 7.7	34.7 3.2	0.71	0.02	0.55	6E-04	0.25	—
	C18:1Δ9(n-9)	0.3 0.01	0.7 0.1	0.8 0.2	0.8 0.7	0.6 0.2	0.7 0.5	1.0 0.1	0.52	—	0.29	—	0.19	—
	C20:1Δ11(n-9)	1.3 0.1	0.9 0.5	0.9 0.06	0.9 0.4	0.7 0.3	1.0 0.7	0.7 0.2	-0.51	—	-0.27	—	-0.37	0.03
	C22:1Δ13(n-9)	1.4 0.9	2.0 0.9	1.8 0.5	2.8 1.1	2.0 0.9	1.4 0.3	1.0 0.5	-0.50	—	-0.37	0.03	-0.15	—
	Σ(MUFAS)	31.6 1.9	34.0 5.5	27.7 1.3	29.6 3.6	29.8 3.1	35.8 7.2	48.0 3.8	0.84	0.002	0.74	2E-7	0.28	—
PUFAs	C18:2(n-6)	6.7 0.3	7.6 2.0	7.4 0.8	6.1 1.2	7.1 1.0	6.9 0.2	7.2 0.8	0.08	—	0.05	—	0.09	—
	C18:3(n-6)	2.1 0.2	2.1 0.5	2.3 0.2	2.0 0.2	2.1 0.9	1.8 0.3	1.2 0.3	-0.82	0.004	-0.51	0.002	-0.39	0.02
	C20:2(n-6)	1.5 0.05	1.4 0.6	1.7 0.3	1.4 0.7	1.0 0.3	1.3 0.5	1.6 0.2	-0.01	—	0.05	—	-0.06	—
	C20:3(n-6)	4.4 0.2	3.6 0.6	4.9 0.1	4.5 0.7	4.3 0.3	4.8 1.3	3.5 0.7	-0.24	—	-0.18	—	0.03	—
	C20:4(n-6)	4.4 0.06	3.9 0.9	4.1 0.2	4.2 0.8	4.2 0.7	3.4 0.7	2.7 0.8	-0.89	5E-4	-0.55	6E-04	-0.46	0.005
	C20:4(n-3)	5.3 0.07	4.5 1.0	6.9 0.1	5.9 0.4	5.3 0.3	5.1 1.4	3.2 0.9	-0.64	0.05	-0.54	8E-04	-0.26	—
	C20:5(n-3)	14.9 0.04	14.3 2.4	16.5 0.1	15.4 1.4	17.3 1.3	12.3 1.0	6.4 0.9	-0.85	0.002	-0.80	6E-09	-0.43	0.01
	Σ(PUFAS) ≥3 desat sites	31.2 0.3	28.4 4.8	34.9 0.4	32.1 0.1	33.2 1.2	27.4 2.9	17.0 3.2	-0.82	0.004	-0.77	6E-08	-0.36	0.03

Supplemental Table S3b. Fatty-acid ratios implying lipid-synthetic activities

(N.B.: double-mutant control strains, not shown here, were included to determine correlation coefficients)

Median Adult Lifespan:	~1X	1	1.14X	1.21X	1.63X	2.3X	9.6X	Pearson		Pearson		Rank-Order		
Genotype:	<i>old-1(zls3000)</i>	WT (N2DRM)	<i>eat-18(ad820)</i>	<i>unc-31(e928)</i>	<i>age-1(hx546)</i>	<i>daf-2(e1370)</i>	<i>age-1(mg44)</i>	Correlation to		Correlation to		Correlation		
Strain(Biol. N):	SR803 (2)	N2DRM (5)	SR801 (2)	SR800 (2)	SR807 (5)	SR806 (3)	SR808 (4)	log LS (N=10)		log LS (N=36)		to LS (N=36)		
	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	R	P _R ≤	R	P _R ≤	R _s	P _R ≤
ACL	18.2 0.2	18.0 0.2	18.2 0.1	17.9 0.1	18.1 0.2	18.0 0.1	17.6 0.2	-0.87	0.002	-0.63	5E-5	-0.49	0.003	
DBI	181.4 0.6	174.2 12.0	194.6 2.6	181.6 10.2	189.5 6.9	167.5 7.4	135.2 9.0	-0.84	0.003	-0.78	2E-8	-0.40	0.02	
PI	150.8 0.4	140.8 19.8	167.8 3.0	154.2 7.0	163.3 7.6	130.2 9.7	81.5 11.9	-0.85	0.002	-0.80	7E-9	-0.39	0.02	
ω3/ω6 ratio	1.06 0.04	1.03 0.24	1.15 0.06	1.18 0.09	1.21 0.08	0.96 0.11	0.60 0.08	-0.81	0.005	-0.70	2E-6	-0.37	0.03	
Δ9 Desaturase Activity														
C16:1Δ9/16:0	0.72 0.08	0.71 0.13	0.54 0.02	0.63 0.16	0.54 0.25	0.88 0.02	2.23 0.29	0.93	1E-4	0.90	5E-14	0.35	0.04	
C18:1Δ9/18:0	0.028 0.003	2.98 1.06	1.93 0.02	1.96 0.48	2.37 0.40	3.30 1.81	5.60 1.58	0.79	0.007	0.61	8E-5	0.28	—	
Total Δ9 activity	0.22 0.03	0.25 0.04	0.20 0.01	0.23 0.08	0.19 0.06	0.34 0.03	1.05 0.24	0.94	5E-5	0.91	4E-14	0.35	0.04	
Δ5 Desaturase Activity														
C20:4(n-6)/C20:3(n-6)	1.00 0.07	1.10 0.14	0.83 0.01	0.92 0.03	0.99 0.22	0.75 0.27	0.75 0.09	-0.71	0.03	-0.44	0.008	-0.56	5E-4	
Δ6 Desaturase Activity														
C18:3(n-6)/C18:2(n-6)	0.31 0.02	0.29 0.11	0.32 0.06	0.33 0.10	0.30 0.11	0.26 0.04	0.17 0.07	-0.75	0.02	-0.50	0.003	-0.37	0.03	
Omega-3 Desaturase Activities														
C20:5(n-3)/C20:4(n-6)	3.37 0.04	3.70 0.52	4.02 0.13	3.79 1.04	4.23 0.77	3.83 1.11	2.56 0.70	-0.71	0.02	-0.41	0.02	-0.15	—	
C20:4(n-3)/C20:3(n-6)	1.21 0.08	1.27 0.16	1.40 0.01	1.34 0.31	1.25 0.06	1.08 0.12	0.91 0.13	-0.88	8E-4	-0.69	3E-6	-0.55	6E-4	
Elongase Activities														
C16:0/C14:0	4.57 0.02	3.85 0.72	3.46 0.15	4.17 0.56	4.40 1.15	3.25 0.72	1.66 0.58	-0.88	8E-4	-0.70	2E-06	-0.52	0.002	
C18:0/C16:0	2.62 0.04	2.58 0.29	2.47 0.25	2.57 0.44	2.57 0.23	1.99 0.24	1.41 0.54	-0.94	8E-5	-0.76	7E-8	-0.51	0.002	
C20:0/C18:0	0.39 0.02	0.33 0.07	0.37 0.02	0.40 0.03	0.33 0.15	0.29 0.10	0.22 0.07	-0.86	0.002	-0.47	0.005	-0.39	0.02	