

Reference	Assay/Ability	Worms per Unit	# of Units	Advantages	Limitations
Le, et al. (2020) HeALTH	LS (DR)	1	60	- Multiple chips are monitored simultaneously on linear stage	- No pillars in chambers - Complicated to load worms - Difficult to operate
Rahman, et al. (2020) NemaLife	LS (DR); Motility; Food intake	15	9	- Intermittent fluid flow - Tests multiple populations	- No individual tracking - Limited capacity
Banse, et al. (2019) Stress-Chip	LS (DR); Oxidative and osmotic stress	1	100	- Automated survival scoring	- Complicated to load worms - Prone to clogging - One population per chip
Letizia, et al. (2018)	Developmental rate	1	16	- Great tool for embryonic and post-embryonic studies	- Application specific - Limited capacity - One population per chip
Mondal, et al. (2016)	High-throughput imaging	40	96	- High-resolution and high-speed image acquisition - Tests multiple populations	- Application specific
Li, et al. (2015)	RS; Brood size	1	16	- Automated RS and brood size scoring	- Application specific - Complicated to load animals - Small number of worms
Xian, et al. (2013) WormFarm	LS (DR)	40	8	- Automated survival, body size and motility scoring - Tests multiple populations	- No pillars in chambers - Difficult to operate - No individual tracking
Albrecht, et al. (2011)	Chemosensory behaviors	25	1	- Great tool for chemosensory stimulus studies	- Application specific
Churgin, et al. (2017) WormMotel	LS; Motility	1	240	- Automated survival and motility analysis of individual worms	- No progeny removal mechanism - Laborious to fabricate
Pincus, et al. (2011)	LS; Motility; High-throughput imaging	1	100	- Enables long-term tracking of individual worms	- No progeny removal mechanism - No mid-life manipulation
Stroustrup, et al. (2013) Lifespan Machine	LS	35	10×16	- Automated data acquisition and processing	- No progeny removal mechanism - No individual tracking
Kerr, et al. (2022) C. elegans Observatory	LS; Body size; Motility	40-60	64×9	- Automated data acquisition and processing	- No progeny removal mechanism - No individual tracking

Table S1

Table A in S2.

Fig.	Assay	Test Condition	Comparison	Rep #	Mean	% Change	p-value	n
2a	LS	N2, Unmated, Live OP50, Chip	repB/repA	NA	13.46/13.63	-1.24	0.2074, n.s.	80/99
			repC/repA	NA	13.04/13.63	-4.32	0.1187, n.s.	100/99
			repD/repA	NA	14.27/13.63	+4.48	0.0587, n.s.	66/99
2b	LS	N2, Unmated, Live OP50, Chip	15°C/20°C	1	19.81/12.19	+62.51	<0.0001	66/66
			25°C/20°C	1	7.25/12.19	-40.52	<0.0001	66/66
2c	LS	N2, Unmated, Live OP50	Chip/Plate	1	16.28/16.70	-2.51	0.253, n.s.	66/80
		<i>eat-2</i> , Unmated, Live OP50		1	22.24/22.97	-3.17	0.135, n.s.	66/80
		Unmated, Live OP50, Chip	<i>eat-2</i> /N2	1	22.24/16.28	+36.60	<0.0001	66/66
2d	LS	N2, Live OP50, Chip	Mated/Unmated	1	13.33/16.28	-18.12	0.0003	62/66
				2	13.08/14.35	-8.85	0.0006	67/66
				3	11.77/13.04	-9.22	<0.0001	100/100
2e	RS	N2, Live OP50, Chip	Mated/Unmated	1	7.56/5.51	+37.20	<0.0001	100/101
				2	9.51/5.87	+62.01	<0.0001	67/66
				3	7.93/5.84	+35.78	<0.0001	98/99
2f	PP	N2, Chip	Mated/Unmated	1	NA	NA	NA	51/51
2g	LS	N2, Unmated, HK OP50	UA/Control	1	13.40/11.74	+14.14	0.0001	100/100
2h	RS	N2, Mated, HK OP50	UA/Control	1	7.30/6.27	+16.34	0.0036	100/100
				2	7.68/6.97	+10.18	0.0006	100/100
2i	LS	N2, Unmated, HK OP50	Met/Control	1	13.97/11.74	+19.00	<0.0001	100/100
				2	14.30/12.82	+11.54	<0.0001	100/100
2j	RS	N2, Mated, HK OP50	Met/Control	1	7.40/6.27	+17.90	0.0026	100/100
				2	12.22/10.67	+14.52	0.0002	99/95
3c	RS	Mated, Live OP50, Plate	<i>daf-2</i> /N2	1	12.74/9.87	+29.07	<0.0001	106/89
3d	RS	Mated, Live OP50, Chip	<i>daf-2</i> /N2	1	13.15/7.10	+85.20	<0.0001	196/100
5a	RS	N2, Mated, Plate	HK/Live OP50	1	NA/9.87	NA	NA	100/89
5c	LS	N2, Unmated, Chip	HK/Live OP50	1	14.20/13.46	+5.49	0.0003	80/80
				2	14.18/14.35	-1.18	0.7757, n.s.	50/66
				3	15.99/14.52	+10.12	<0.0001	50/40
5e	LS	N2, Mated, Chip	HK/Live OP50	1	15.25/12.83	+18.86	<0.0001	50/50
				2	16.54/13.08	+26.45	<0.0001	50/67
				3	15.87/13.41	+18.34	<0.0001	50/40
5f	RS	N2, Mated, Chip	HK/Live OP50	1	11.18/8.53	+31.06	<0.0001	50/50
				2	11.95/8.86	+34.87	<0.0001	50/40
				3	12.30/9.51	+29.33	<0.0001	50/67
5h	Length	N2, Mated, Chip	HK/Live OP50	1	1.25/1.46	-14.38	<0.0001	20/19
				2	1.29/1.48	-12.83	<0.0001	25/25
				3	1.31/1.49	-12.08	<0.0001	30/33
5i	Width	N2, Mated, Chip	HK/Live OP50	1	61.47/67.76	-9.28	0.0002	20/20
				2	62.38/70.84	-11.94	<0.0001	25/25
				3	61.84/66.59	-7.13	0.0001	30/33
5j	LS	<i>glp-1</i> , Mated, Chip	HK/Live OP50	1	9.69/9.02	+7.42	0.3424, n.s.	50/40
				2	9.74/9.39	+3.72	0.4001, n.s.	50/50
5k	Length	<i>glp-1</i> , Mated, Chip	HK/Live OP50	1	1.46/1.51	-3.31	0.1840, n.s.	24/25
6a	RS	<i>eat-2</i> , Mated, Chip	HK/Live OP50	1	14.46/13.54	+6.79	0.0418	50/50
6c	LS	<i>skn-1</i> , Mated, Chip	HK/Live OP50	1	13.16/10.97	+19.96	<0.0001	62/59
				2	12.60/11.33	+11.20	<0.0001	50/40
6d	RS	<i>skn-1</i> , Mated, Chip	HK/Live OP50	1	9.37/7.67	+22.16	0.0005	62/59
				2	10.32/8.23	+25.39	0.0016	42/37
6e	Length	<i>skn-1</i> , Mated, Chip	HK/Live OP50	1	1.37/1.56	-13.86	<0.0001	19/19
				2	1.41/1.55	-9.03	<0.0001	25/25

6f	LS	<i>daf-16</i> , Mated, Chip	HK/Live OP50	1	11.17/9.92	+12.60	0.0041	50/50	
				2	12.48/10.86	+14.91	0.0002	50/50	
6g	RS	<i>daf-16</i> , Mated, Chip	HK/Live OP50	1	10.79/8.16	+32.23	<0.0001	50/50	
				2	12.04/9.24	+30.30	0.0012	50/50	
6h	Length	<i>daf-16</i> , Mated, Chip	HK/Live OP50	1	1.22/1.50	-18.66	<0.0001	21/20	
6i	LS	<i>sgk-1</i> , Mated, Chip	HK/Live OP50	1	18.43/18.05	+2.10	0.7529, n.s.	40/40	
				2	15.36/15.00	+2.40	0.8382, n.s.	50/50	
6j	RS	<i>sgk-1</i> , Mated, Chip	HK/Live OP50	1	15.56/15.81	-1.58	0.7146, n.s.	40/40	
				2	15.76/14.95	+5.34	0.3483, n.s.	50/50	
6k	Length	<i>sgk-1</i> , Mated, Chip	HK/Live OP50	1	0.91/0.96	-4.30	0.0103	20/20	
7a	LS	Mated, Live OP50, Chip		<i>sgk-1/N2</i>	1	18.05/12.83	+40.68	<0.0001	40/50
				<i>daf-16/N2</i>	1	10.86/12.83	-15.35	<0.0001	50/50
				<i>skn-1/N2</i>	1	10.61/12.83	-17.30	<0.0001	70/50
					2	11.33/13.44	-15.69	<0.0001	40/40
7b	RS	Mated, Live OP50, Chip		<i>sgk-1/N2</i>	1	15.81/8.53	+85.34	<0.0001	40/50
				<i>daf-16/N2</i>	1	9.24/8.53	+8.32	0.0530, n.s.	50/50
				<i>skn-1/N2</i>	1	6.91/8.53	-18.99	0.0078	70/50
7f	RS/LS	Unmated, Live OP50, Chip		<i>daf-16/N2</i>	NA	0.54/0.41	+31.70	<0.0001	41/147
				<i>skn-1/N2</i>	NA	0.48/0.41	+17.07	0.0005	28/147
				<i>sgk-1/N2</i>	NA	0.77/0.41	+87.80	<0.0001	43/147
		Mated, Live OP50, Chip		<i>sgk-1/N2</i>	NA	0.78/0.66	+18.18	<0.0001	26/126
		<i>sgk-1</i> , Live OP50, Chip	Mated/Unmated	NA	0.78/0.77	+1.29	0.7899, n.s.	26/43	
7g	LS	N2, Live OP50, Chip	Mated/Unmated	1	13.08/14.35	-8.85	0.0006	67/66	
				2	11.77/13.04	-9.22	<0.0001	100/100	
		<i>sgk-1</i> , Live OP50, Chip	Mated/Unmated	1	15.01/14.09	+6.5	0.0003	50/50	
S.1e	RS	N2, Mated, Live OP50, Chip		repB/repA	NA	8.53/8.27	+3.14	0.2334, n.s.	50/100
				repC/repA	NA	7.93/8.27	-4.11	0.2009, n.s.	99/100
				repD/repA	NA	8.86/8.27	+7.13	0.0610, n.s.	40/100
S.1f	Length	N2, Live OP50, Chip	Mated/Unmated	1	1.47/1.50	-2.00	0.3953, n.s.	20/20	
				2	1.48/1.45	+2.06	0.2125, n.s.	25/25	
				3	1.49/1.51	-1.32	0.5625, n.s.	33/30	
S.1g	LS	N2, Unmated, HK OP50	NMN/Control	1	11.74/11.74	+0.02	0.3482, n.s.	100/100	
S.1h	RS	N2, Mated, HK OP50	NMN/Control	1	6.4/6.27	+1.95	0.7553, n.s.	100/100	
				2	8.14/7.27	+11.96	0.9022, n.s.	100/100	
S.1i	LS	N2, Unmated, HK OP50	NAC/Control	1	12.72/11.74	+8.34	0.0148	100/100	
S.1j	RS	N2, Mated, HK OP50	NAC/Control	1	6.81/6.27	+8.49	0.1998, n.s.	100/100	
				2	6.24/6.10	+2.29	0.508, n.s.	85/77	
S.3a	RS	N2, Unmated, Chip	HK/Live OP50	1	5.70/5.39	+5.75	0.0037	80/80	
				2	6.23/5.87	+6.13	0.0112	50/40	
S.3b	Length	N2, Unmated, Chip	HK/Live OP50	1	1.26/1.50	-16	<0.0001	21/20	
				2	1.28/1.45	-11.72	<0.0001	25/25	
				3	1.31/1.51	-13.24	<0.0001	30/31	
S.3c	Width	N2, Unmated, Chip	HK/Live OP50	1	61.12/71.23	-14.19	<0.0001	21/20	
				2	62.77/67.44	-6.92	0.0005	25/25	
				3	58.46/67.73	-13.68	<0.0001	30/31	
S.3d	Length	Unmated, Live Op50, Chip	<i>sgk-1/N2</i>	1	0.97/1.50	-35.33	<0.0001	25/20	

Table B in S2.

Fig.	Test Condition	Comparison	Experiments	n	Mean	% Change	P-value
3a	N2, Mated, Live OP50	Chip/Plate	11/7	852/519	10.86/78.69	-86.19	<0.0001
3b	N2, Unmated, Live OP50	Chip/Plate	1	100/89	NA	NA	<0.0001
	<i>daf-2</i> , Unmated, Live OP50	Chip/Plate	1	196/106	NA	NA	<0.0001
5b	N2, Mated, HK OP50	Chip/Plate	1	89/100	NA	NA	<0.0001
6b	<i>eat-2</i> , Mated, Chip	HK/Live OP50	1	50/50	NA	NA	0.0125

Table C in S2.

Fig.	Correlation	Panel Condition	Test Condition	n	Experiments	r-value	p-value
4a	LS-Length	Unmated, Live OP50, Chip	N2	132	3	+0.01	0.9313, n.s.
			<i>glp-1</i>	53	2	-0.33	0.0165
			<i>daf-2</i>	37	1	+0.38	0.0224
4b	LS-Width	Unmated, Live OP50, Chip	N2	132	3	-0.18	0.0447
			<i>glp-1</i>	53	2	-0.29	0.0372
			<i>daf-2</i>	37	1	-0.01	0.9424, n.s.
4c	RS-Length	N2, Live OP50, Chip	Unmated	132	3	+0.03	0.7241, n.s.
			Mated	60	2	-0.29	0.0246
4d	LS-RS	N2, Live OP50, Chip	Unmated	147	3	+0.02	0.7596, n.s.
			Mated	126	3	+0.09	0.3152, n.s.
4e	LS-PP	N2, Live OP50, Chip	Unmated	34	1	+0.363	0.0346
			Mated	34	1	+0.149	0.4003, n.s.
4f	RS-PP	N2, Live OP50, Chip	Unmated	50	1	+0.543	<0.0001
			Mated	49	1	+0.917	<0.0001
5d	LS-RS	N2, Unmated, Chip	Live OP50	147	3	+0.02	0.7596, n.s.
			HK OP50	168	3	-0.06	0.4406, n.s.
5g	LS-RS	N2, Mated, Chip	Live OP50	126	3	+0.09	0.3152, n.s.
			HK OP50	132	3	+0.25	0.0045
7c	LS-RS	Unmated, Live OP50, Chip	<i>sgk-1</i>	43	1	+0.49	0.0008
			N2	147	3	+0.02	0.7596, n.s.
			<i>skn-1</i>	28	1	-0.06	0.7432, n.s.
			<i>daf-16</i>	41	1	-0.26	0.0901, n.s.
7d	LS-RS	Mated, Live OP50, Chip	<i>sgk-1</i>	26	2	+0.64	0.0004
			N2	126	3	+0.09	0.3152, n.s.
			<i>skn-1</i>	104	3	+0.50	<0.0001
			<i>daf-16</i>	48	2	+0.55	<0.0001

Table S2