

ELECTRONIC SUPPLEMENTARY INFORMATION (ESI)

Supplementary Movie S1

The video shows progeny removal from one of the on-chip worm culture chambers (in this case C2). During the hermaphrodites' reproductive phase, larvae at different development stages increasingly populate the worm chambers on the chip. A flow rate of approximately 100 nl/s is applied to the device by suction from the outlet on the right hand side (Out2). Adult worms do not enter the connecting channels for two reasons: (i) they tend to swim against the flow directed towards the outlet, and (ii) if approaching the channels, they are mechanically retained by the chamber rim, having a thickness of 50 μm (compared to 150 μm of the chamber itself), which is slightly smaller than the diameter of an adult worm. The screw valve V3 is fully open, thus larvae can be efficiently removed from C2 by transfer to Out2. A cluster of worm embryos is visible on the video, which is difficult to remove from the chamber as shear forces are generally not high enough to disintegrate such very sticky assemblies. However, the cluster will progressively disappear upon hatching of the larvae.

Supplementary Fig. S1

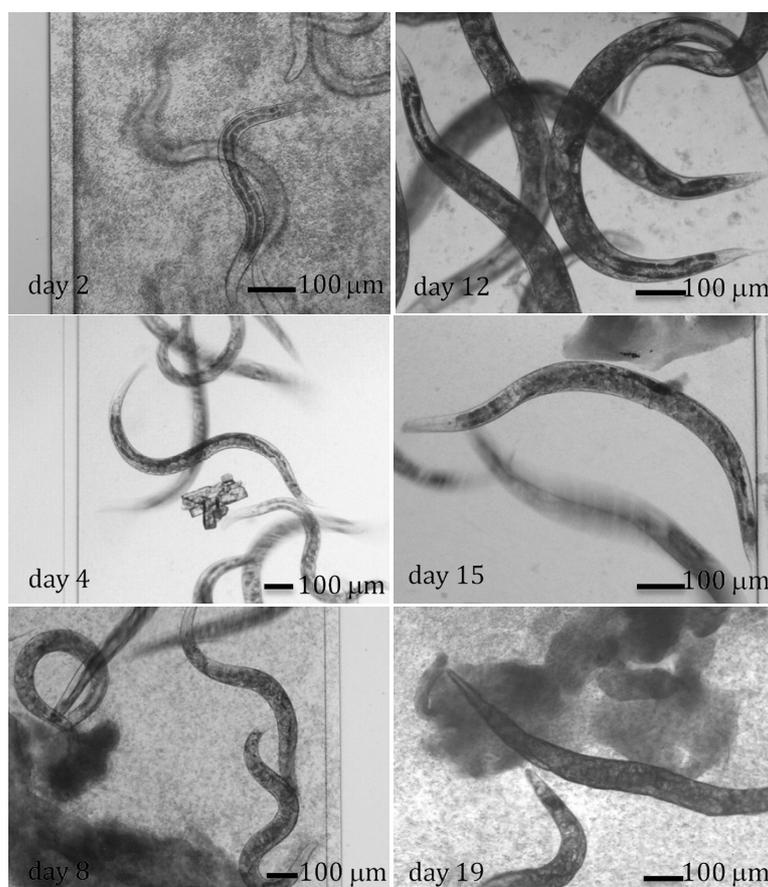


Fig. S1 Validation of *C. elegans* hermaphrodite on-chip culture over the whole lifespan. Consecutive images confirm normal development of WT her(-males) worms (no males are present on the chip). After hatching (day 1), L1 larvae were immediately loaded into the chip. The image taken at day 2 corresponds to the L4 larva stage, subsequent images show adult worms, e.g. in gravid state (day 4 to 12) or close to dead (day 19). A concentrated *E. coli* suspension has been loaded into the microfluidic chamber anytime when necessary, i.e. after nutrient depletion. Images at day 2, 8 or 19 show chambers with high numbers of bacteria, whereas at day 4, 12 and 15 nearly all bacteria have been consumed.

Supplementary Table S1

Hermaphrodites' lifespan analysis for male-conditioned and non-conditioned on-chip assays, corresponding to data shown in Fig. 5a of the main article and repeated experiments. Statistical analysis was performed on Kaplan-Meier survival curves in Prism 6 by log rank tests.

	Assay	Lifespan (days) mean/median/maximal	#Worms	Censored	log rank <i>P</i> value	
1	WT her(-males)	15/14/19	81	13		Fig. 5a
	WT her(+males)	11/10/14	69	8	vs WT her(-males), <i>P</i> < 0.0001	Fig. 5a
2	WT her(-males)	14/13/21	75	16		not shown
	WT her(+males)	11/10/16	86	10	vs WT her(-males), <i>P</i> < 0.0001	not shown
3	WT her(-males)	14/13/18	81	17		not shown
	WT her(+males)	10/9/14	71	15	vs WT her(-males), <i>P</i> < 0.0001	not shown
4	WT her(-males)	14/14/18	73	20		not shown
	WT her(+males)	11/10/14	64	12	vs WT her(-males), <i>P</i> < 0.0001	not shown