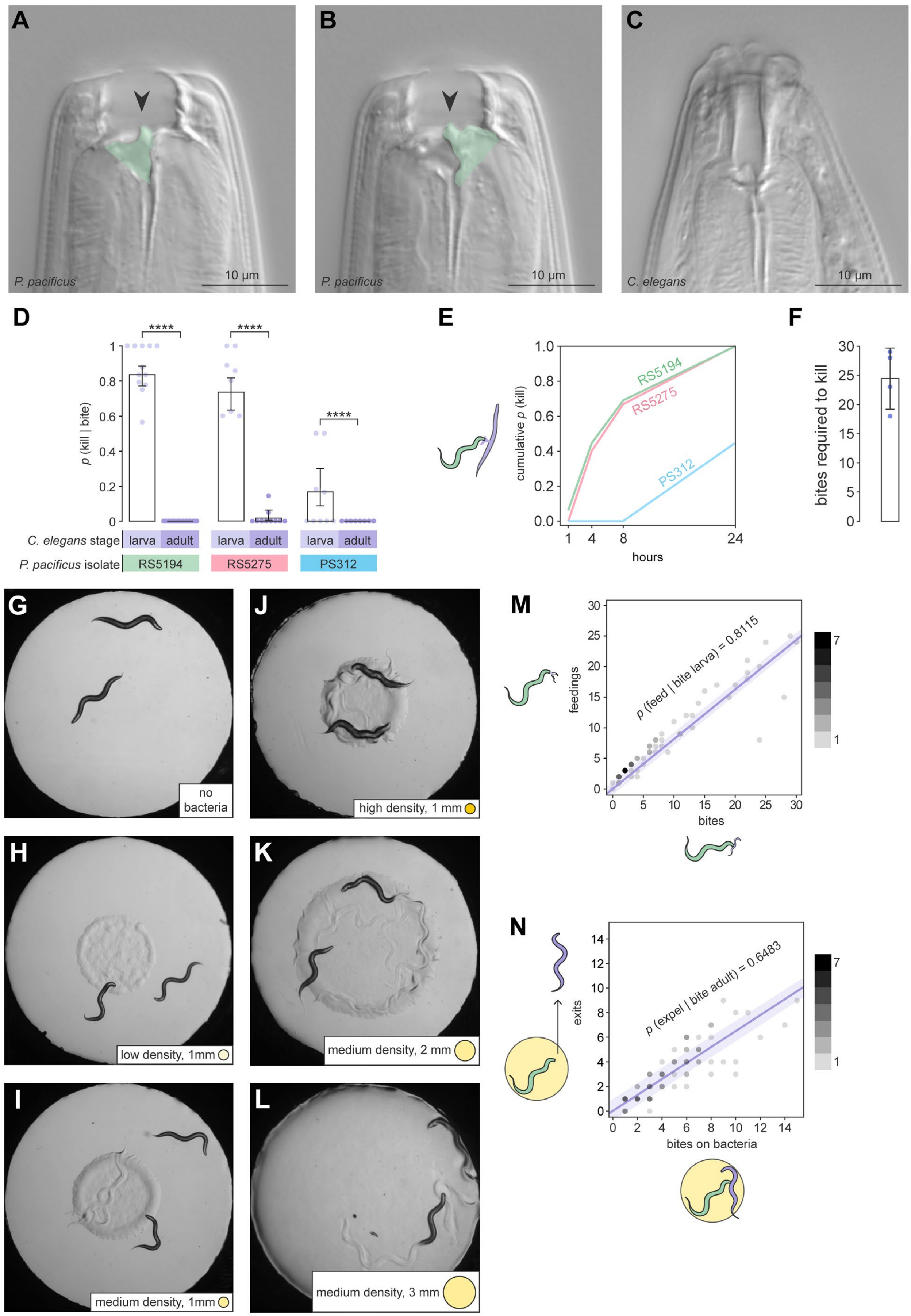

A
B
C
P. pacificus
P. pacificus
C. elegans
10 µm
10 µm
10 µm
D
p (kill | bite)
****
****
****
C. elegans stage
larva
adult
larva
adult
larva
adult
P. pacificus isolate
RS5194
RS5275
PS312
E
cumulative p (kill)
RS5194
RS5275
PS312
hours
F
bites required to kill
G
no bacteria
H
low density, 1mm
I
medium density, 1mm
J
high density, 1 mm
K
medium density, 2 mm
L
medium density, 3 mm
M
feedings
p (feed | bite larva) = 0.8115
bites
N
exits
p (expel | bite adult) = 0.6483
bites on bacteria

Figure S1. Outcomes of biting *C. elegans* off and on bacteria, related to Figures 1A–1K

(A–B) Pseudo-colored (A) ventral and (B) dorsal tooth of eurystomatous adult *P. pacificus* (strain: RS5194).

(C) Toothless mouth of adult *C. elegans* (strain: N2)

(D) Instantaneous killing ability of different wild isolates of *P. pacificus*, expressed as probability of killing *C. elegans* given a single bite, (Wald test with Benjamini-Hochberg adjustment, $n_{P.pacificus} = 8–16$, $n_{bites\_per\_P.pacificus} = 1–39$). RS5194 *P. pacificus* was selected for experiments featured in main figures.

(E) Long-term killing ability of different wild isolates of *P. pacificus*, expressed as cumulative probability of a killing a single adult *C. elegans* by various time points ($n_{P.pacificus} = 11–16$). RS5194 *P. pacificus* was selected for experiments featured in main figures.

(F) Number of bites that a single adult RS5194 *P. pacificus* inflicted to kill a single adult *C. elegans*.

(G–L) Arenas with various densities and diameters of *E. coli* OP50 bacterial patches (see Methods: Bacterial patches).

(M) Number of larva-targeted bites that lead to predatory feeding ($n_{P.pacificus} = 60$, $n_{bites\_per\_P.pacificus} = 1–31$). Data points were pooled from all conditions in Figure 1J.

(N) Number of adult-targeted bites on bacteria that lead to adult *C. elegans* exiting the bacterial patch ($n_{P.pacificus} = 77$, $n_{bites\_per\_P.pacificus} = 1–14$). Data points were pooled from all conditions in Figure 1K.

(D,M,N) Error bars are predicted probabilities and 95% confidence intervals from binomial logistic regression models of data.

Other error bars are 95% bootstrap confidence intervals.

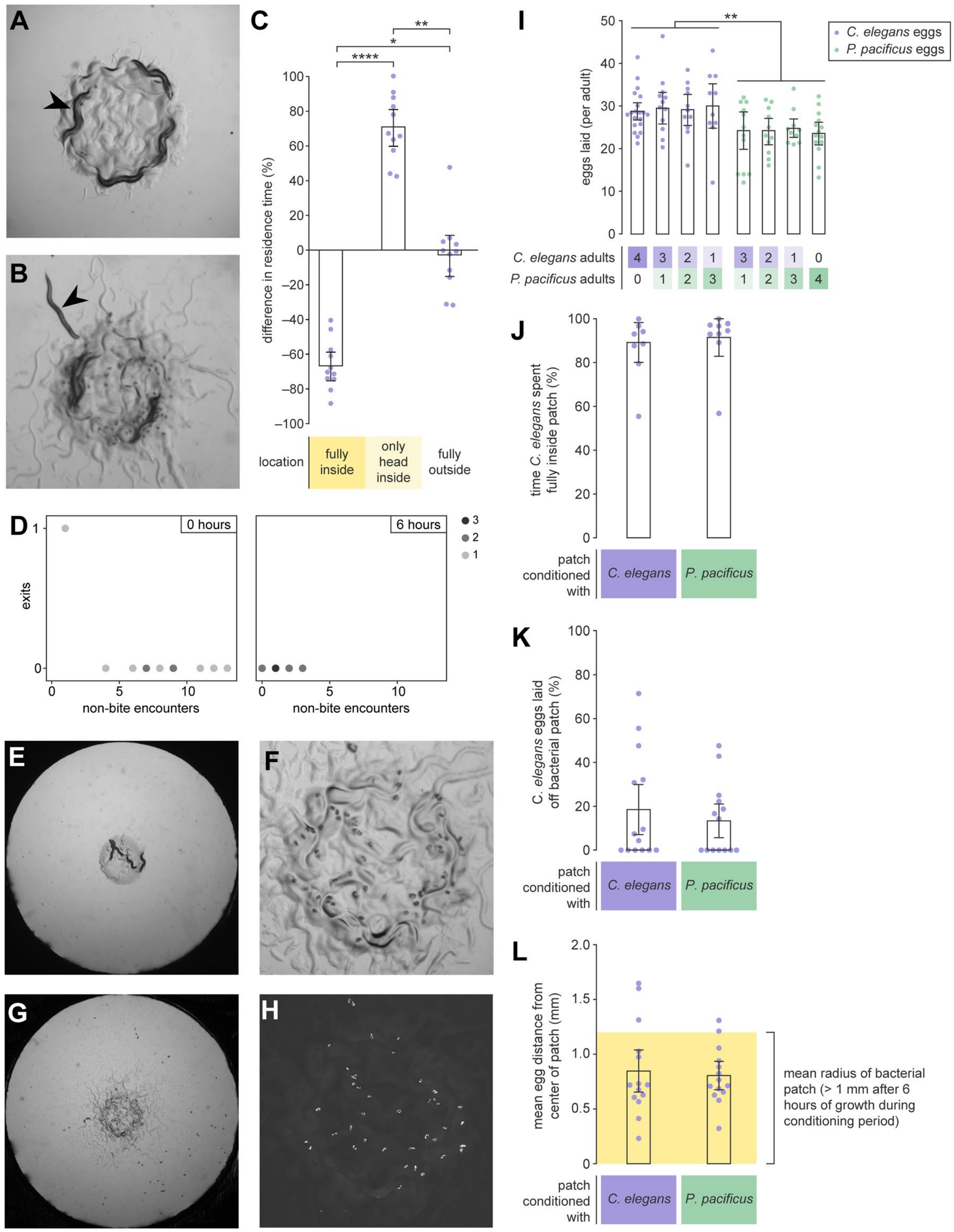

A
B
C
****
*
**
difference in residence time (%)
100
80
60
40
20
0
−20
−40
−60
−80
−100
location
fully inside
only head inside
fully outside
D
0 hours
6 hours
exits
non-bite encounters
3
2
1
E
F
G
H
I
**
C. elegans eggs
P. pacificus eggs
eggs laid (per adult)
C. elegans adults
P. pacificus adults
J
time C. elegans spent fully inside patch (%)
patch conditioned with
C. elegans
P. pacificus
K
C. elegans eggs laid off bacterial patch (%)
L
mean egg distance from center of patch (mm)
mean radius of bacterial patch (> 1 mm after 6 hours of growth during conditioning period)

Figure S2. Biting-induced patch avoidance and egg-laying, related to Figures 1L–1N and Figure 2

(A–B) Single adult *C. elegans* (black arrow) with three adult *P. pacificus* after (A) 0 hours, and (B) 6 hours.

(C) Difference between 0 and 6 hours in adult *C. elegans* residence time on different regions of a bacteria patch occupied by *P. pacificus* (Dunn's test with Benjamini–Hochberg correction, $n_{C.elegans} = 11$).

(D) Number of non-bite encounters that were followed by adult *C. elegans* leaving a bacteria patch, at 0 and 6 hours of predator exposure. Each data point represents an individual arena with 1 *P. pacificus* and 1 adult *C. elegans* ($n_{arena} = 9–11$, $n_{\text{non-bite\_encounters\_per\_arena}} = 0–13$). Shading indicates that multiple arenas had the same number of non-bite encounters and exits.

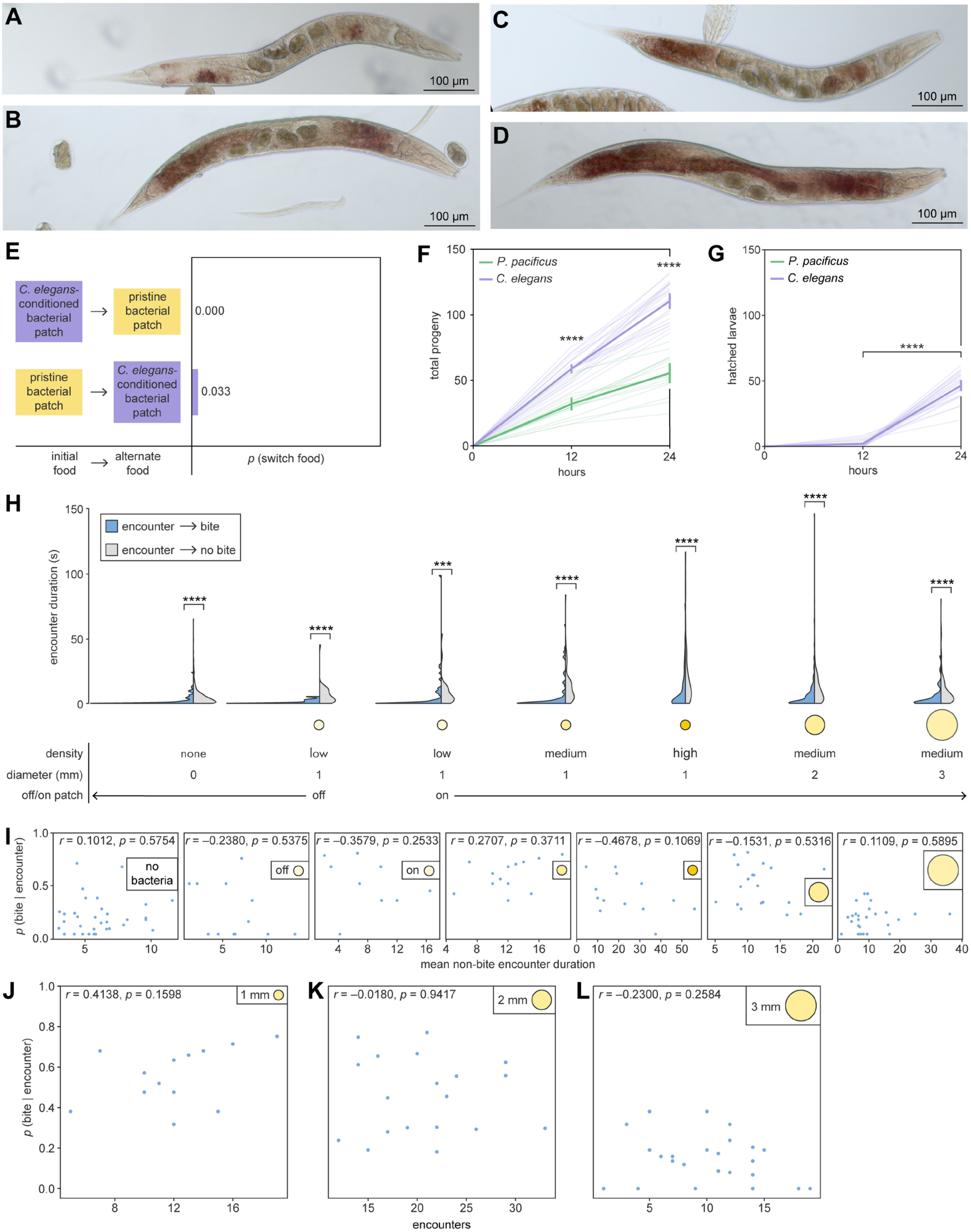
(E–F) Egg distribution assay at (E) 0 hours with four adult nematodes (2 *P. pacificus,* 2 *C. elegans*), and at (F) 7 hours with adults removed.

(G–H) Zoomed-in (G) brightfield and (H) fluorescent view of the bacterial patch in (E). Fluorescent eggs are *C. elegans* (GFP-labeled), while non-fluorescent eggs are *P. pacificus.*

(I) Total eggs laid per *C. elegans* and *P. pacificus* adult, across mixed-species groups (Dunn's test, $n_{\text{arenas}} = 10–20$). Eggs were pooled within species for comparison between species.

(J–L) Bacterial patches were conditioned with either *C. elegans* or *P. pacificus* pheromones (See Methods: Pheromone-conditioned patches). (J) Residence time on conditioned patches (Wilcoxon's signed rank test, $n_{C.elegans} = 10$). (K) Percent of eggs laid off conditioned patches (Wilcoxon's signed rank test, $n_{C.elegans} = 14$). (L) Mean egg distance from center of conditioned patches, with yellow shading indicating distances that fall within the bacterial patch (t-test, $n_{C.elegans} = 14$).

Error bars are 95% bootstrap confidence intervals.



A
100 µm
B
100 µm
C
100 µm
D
100 µm
E
C. elegans-conditioned bacterial patch
pristine bacterial patch
0.000
pristine bacterial patch
C. elegans-conditioned bacterial patch
0.033
initial food
alternate food
p (switch food)
F
P. pacificus
C. elegans
total progeny
hours
G
P. pacificus
C. elegans
hatched larvae
hours
H
encounter → bite
encounter → no bite
encounter duration (s)
density
diameter (mm)
off/on patch
none
low
low
medium
high
medium
medium
off
on
I
r = 0.1012, p = 0.5754
r = –0.2380, p = 0.5375
r = –0.3579, p = 0.2533
r = 0.2707, p = 0.3711
r = –0.4678, p = 0.1069
r = –0.1531, p = 0.5316
r = 0.1109, p = 0.5895
no bacteria
off
on
p (bite | encounter)
mean non-bite encounter duration
J
r = 0.4138, p = 0.1598
1 mm
K
r = –0.0180, p = 0.9417
2 mm
L
r = –0.2300, p = 0.2584
3 mm
p (bite | encounter)
encounters

Figure S3. Influences on and assessment of biting incentive, related to Figure 3

(A–D) Representative images of *P. pacificus* stained with Oil Red O after 6 hours of exclusively feeding on (A) nothing, (B) larval *C. elegans*, (C) adult *C. elegans*, and (D) *E. coli* OP50 bacteria.

(E) Probability of *P. pacificus* switching between a *C. elegans*-conditioned patch (see Methods: Pheromone-conditioned patches) and a pristine (unconditioned) patch (Fisher's exact test, $n_{P. pacificus} = 30$).

(F) Total progeny produced by a single adult *P. pacificus* or *C. elegans* (Wilcoxon's ranked sum test with Benjamini–Hochberg adjustment, $n_{adult} = 16–23$).

(G) *C. elegans* eggs that hatched into larvae (Wilcoxon's signed rank test, $n_{C. elegans} = 16–23$). No *P. pacificus* eggs hatched within 24 hours.

(H) Distributions of durations for bite encounters and non-bite encounters on different types of patches. Encounters were pooled across animals within each patch type. Each distribution is plotted as a probability density function (same area under each curve) (Dunn's test, $n_{encounters} = 10– 492$).

(I) Correlation between non-bite encounter duration and probability of biting during an encounter, for different patch types (Pearson's *r*, $n_{arena} = 9–33$).

(J–L) Correlation between number of encounters and probability of biting during an encounter on a medium density lawn with various diameters (Pearson's *r*, $n_{arena} = 13–26$).

Error bars are 95% bootstrap confidence intervals.

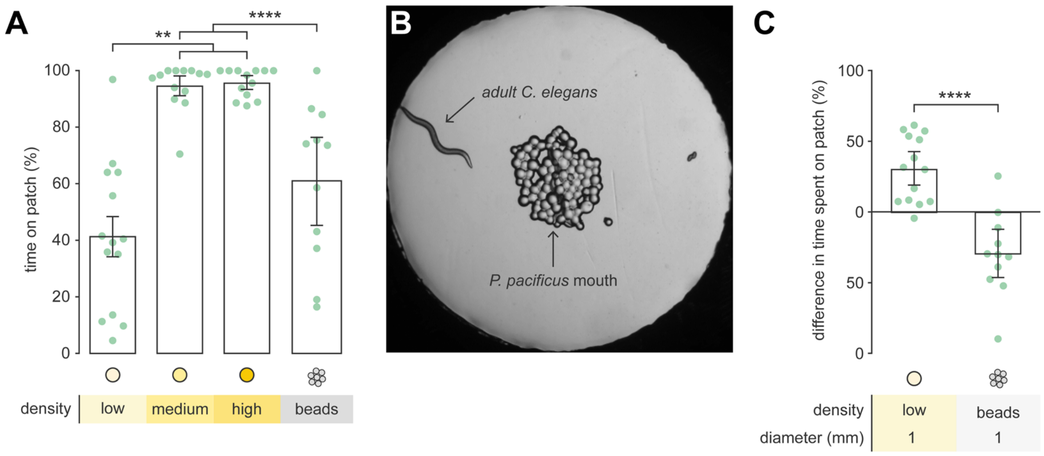


Figure S4. *P. pacificus* residence time on different types of patches, related to Figure 4

(A) *P. pacificus* patch residence time on different types of bacterial and non-bacterial patches (Dunn's test, $n_{P. pacificus}$ = 11–14).

(B) 1 mm patch of rehydrated Sephadex beads (See STAR Methods: Bead patches), with adult *C. elegans* and *P. pacificus*. *P. pacificus* is fully inside the bead patch.

(C) Difference between 0–15 minutes and 15–30 minutes in patch residence time (t-test, $n_{P. pacificus}$ = 11–14).

Error bars are 95% bootstrap confidence intervals.

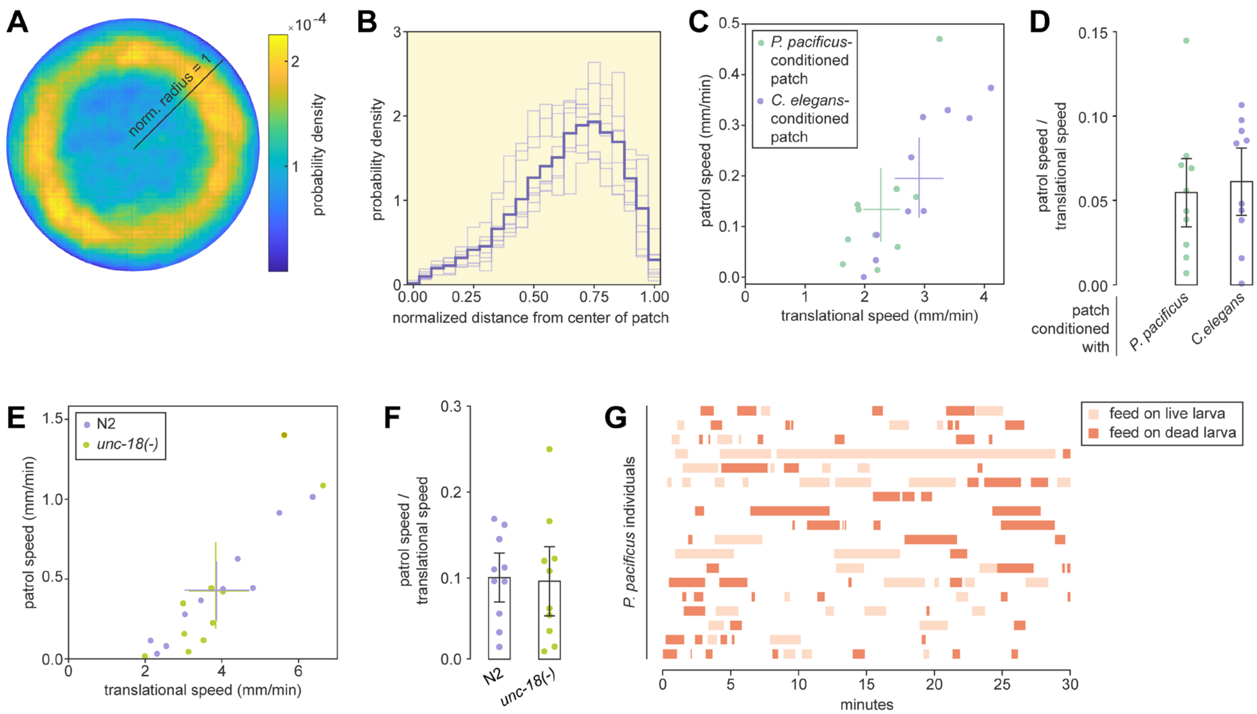


Figure S5. Active and passive search for *C. elegans*, related to Figure 5

(A–B) Histograms of *C. elegans* larvae movement on a medium density, 1 mm bacterial patch (see Methods: Larvae movement). To obtain relative patch locations, all patches were normalized to have a radius of 1. Each bin value represents the probability density of video frames showing larval movement at that location/distance. (A) 2-dimensional location on the patch. (B) 1-dimensional distance from the center of the patch.

(C–D) *P. pacificus* patrolling on *P. pacificus*- and *C. elegans*-conditioned patches (see Methods: Pheromone-conditioned patches). (C) Translational and patrol speeds (Wilcoxon's signed rank test, $n_{P.pacificus} = 10$). (D) patrol speed normalized by translational speed (t-test, $n_{P.pacificus} = 10$)

(E–F) *P. pacificus* patrolling with locomotion-defective *C. elegans* mutant (*unc-18(-)*) and control wildtype *C. elegans* (N2) patch cohabitants. (E) Translational and patrol speeds (Wilcoxon's signed rank test, $n_{P.pacificus} = 10$). (F) Patrol speed normalized by translational speed (t-test, $n_{P.pacificus} = 10$).

(G) Timecourses of when *P. pacificus* feeds on live or dead (previously killed) larvae, after three hours with larvae on a bacteria-free arena ($n_{P.pacificus} = 18$). Each row represents the timecourse for an individual P. pacificus.

Error bars are 95% bootstrap confidence intervals.

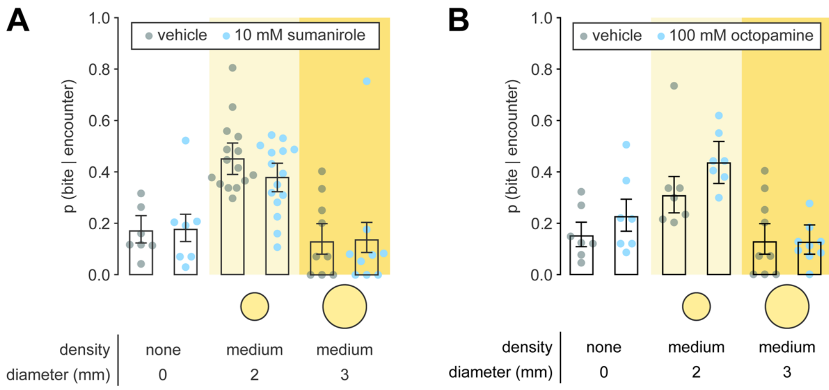


Figure S6. Dopamine D2 receptor agonist and octopamine do not affect territorial biting, related to Figure 6

(A–B) *p(bite|encounter)* for *P. pacificus* treated with (A) the dopamine D2 receptor agonist, sumanirole (Wald test with Benjamini-Hochberg adjustment, $n_{P.\ pacificus} = 7–15$, $n_{\text{encounters per } P.pacificus} = 7–38$), and (B) octopamine (Wald test with Benjamini-Hochberg adjustment, $n_{P.pacificus} = 7–9$, $n_{\text{encounters\_per\_}P.\ pacificus} = 8–42$). Drug concentrations refer to the concentration of drug solution applied to a bacterial patch for treatment (see Methods: Drug treatment).

Error bars are predicted probabilities and 95% confidence intervals from binomial logistic regression models of data.

Figure	Predicted value	Model type	χ^2	df	$p\ (>\chi^2)$
1H	p(kill|bite)	binomial logistic regression	354.48	1	< 2.2e-16
1J	p(feed|bite larva)	binomial logistic regression	15.346	5	0.008982
1K	p(expel|bite adult)	binomial logistic regression	3.606	4	0.4619
2B, *C. elegans*	distance from center of patch	linear mixed-effects model	42.594	3	3.001e-09
2B, *P. pacificus*	distance from center of patch	linear mixed-effects model	5.1518	3	0.161
2C	p(*C. elegans* egg laid off bacterial patch)	binomial logistic regression	602.23	3	< 2.2e-16
2E	p(find bacterial batch)	binomial logistic regression	236.71	5	< 2.2e-16
3E	p(bite|encounter)	binomial logistic regression	129.05	6	< 2.2e-16
3F	p(bite|encounter)	binomial logistic regression	263.49	6	< 2.2e-16
4C	p(bite|encounter)	binomial logistic regression	49.122	2	2.154e-11
6A, none	p(bite|encounter)	binomial logistic regression	0.5656	1	0.452
6A, med-density, 2 mm	p(bite|encounter)	binomial logistic regression	18.839	1	1.423e-05
6A, med-density, 3 mm	p(bite|encounter)	binomial logistic regression	0.1518	1	0.6969
6B, none	p(bite|encounter)	binomial logistic regression	15.911	1	6.641e-05
6B, med-density, 2 mm	p(bite|encounter)	binomial logistic regression	18.869	1	1.4e-05
6B, med-density, 3 mm	p(bite|encounter)	binomial logistic regression	8.0161	1	0.004636
S1D, RS5194	p(kill|bite)	binomial logistic regression	354.48	1	< 2.2e-16
S1D, RS5275	p(kill|bite)	binomial logistic regression	140.5	1	< 2.2e-16
S1D, PS312	p(kill|bite)	binomial logistic regression	16.205	1	5.685e-05
S6A, none	p(bite|encounter)	binomial logistic regression	0.0229	1	0.8797
S6A, med-density, 2 mm	p(bite|encounter)	binomial logistic regression	3.0109	1	0.08271
S6A, med-density, 3 mm	p(bite|encounter)	binomial logistic regression	0.0261	1	0.8717
S6B, none	p(bite|encounter)	binomial logistic regression	3.5778	1	0.05856
S6B, med-density, 2 mm	p(bite|encounter)	binomial logistic regression	5.2815	1	0.02155
S6B, med-density, 3 mm	p(bite|encounter)	binomial logistic regression	0.002	1	0.9648

Table S1: Goodness of fit of statistical models, related to STAR Methods

For binomial logistic regression models and linear mixed-effects models, full models were compared to null models using likelihood ratio test.