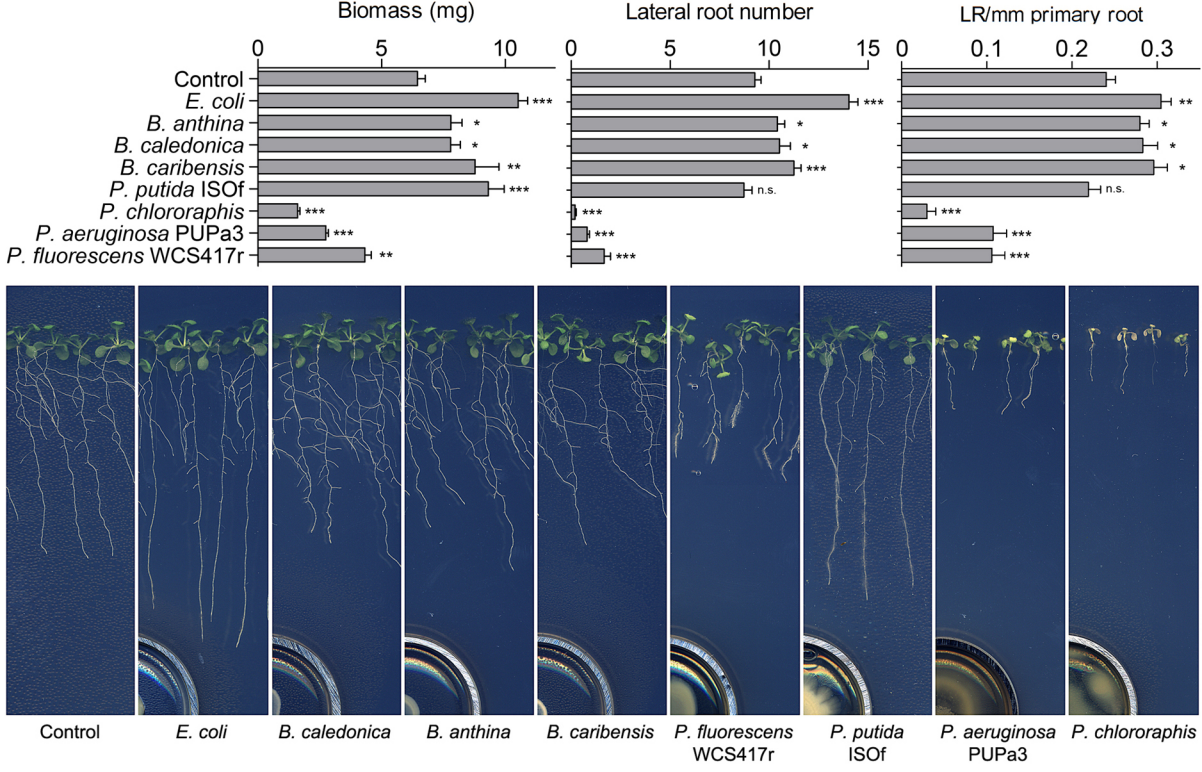
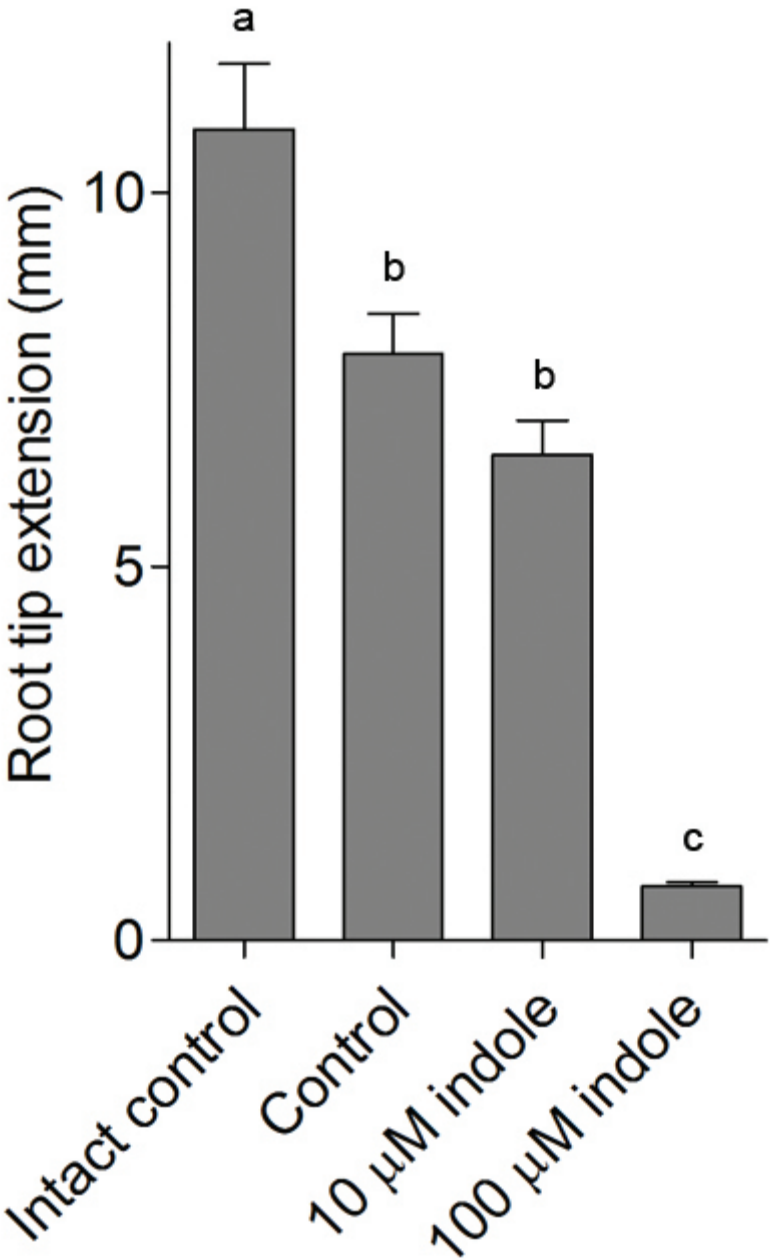
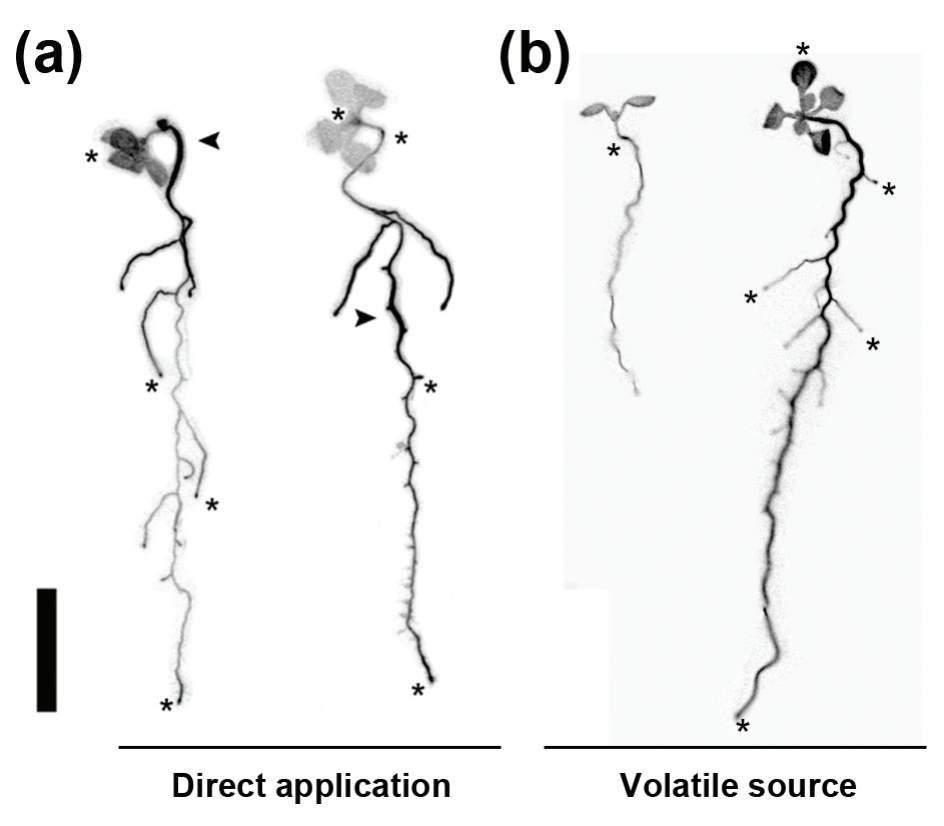
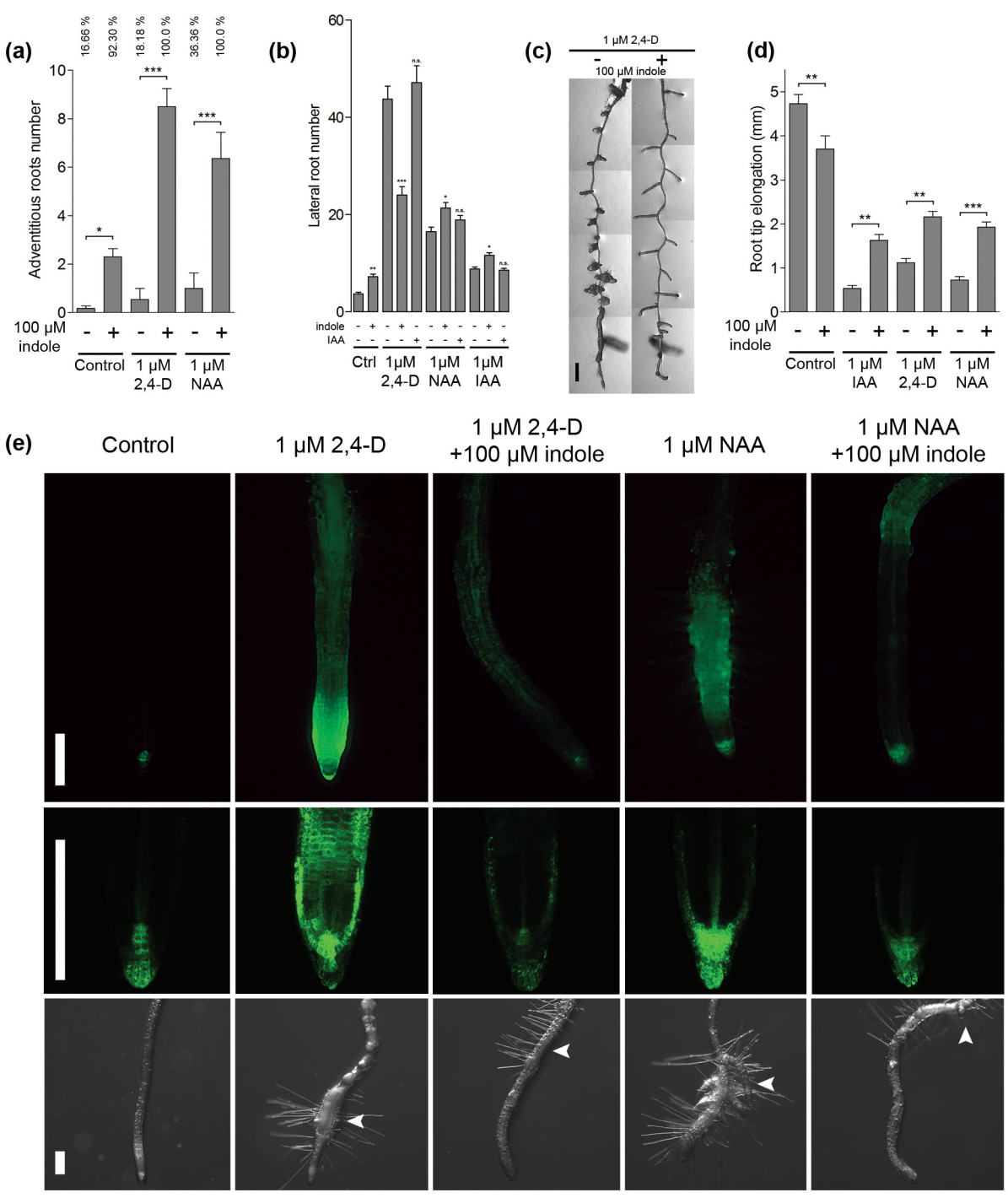
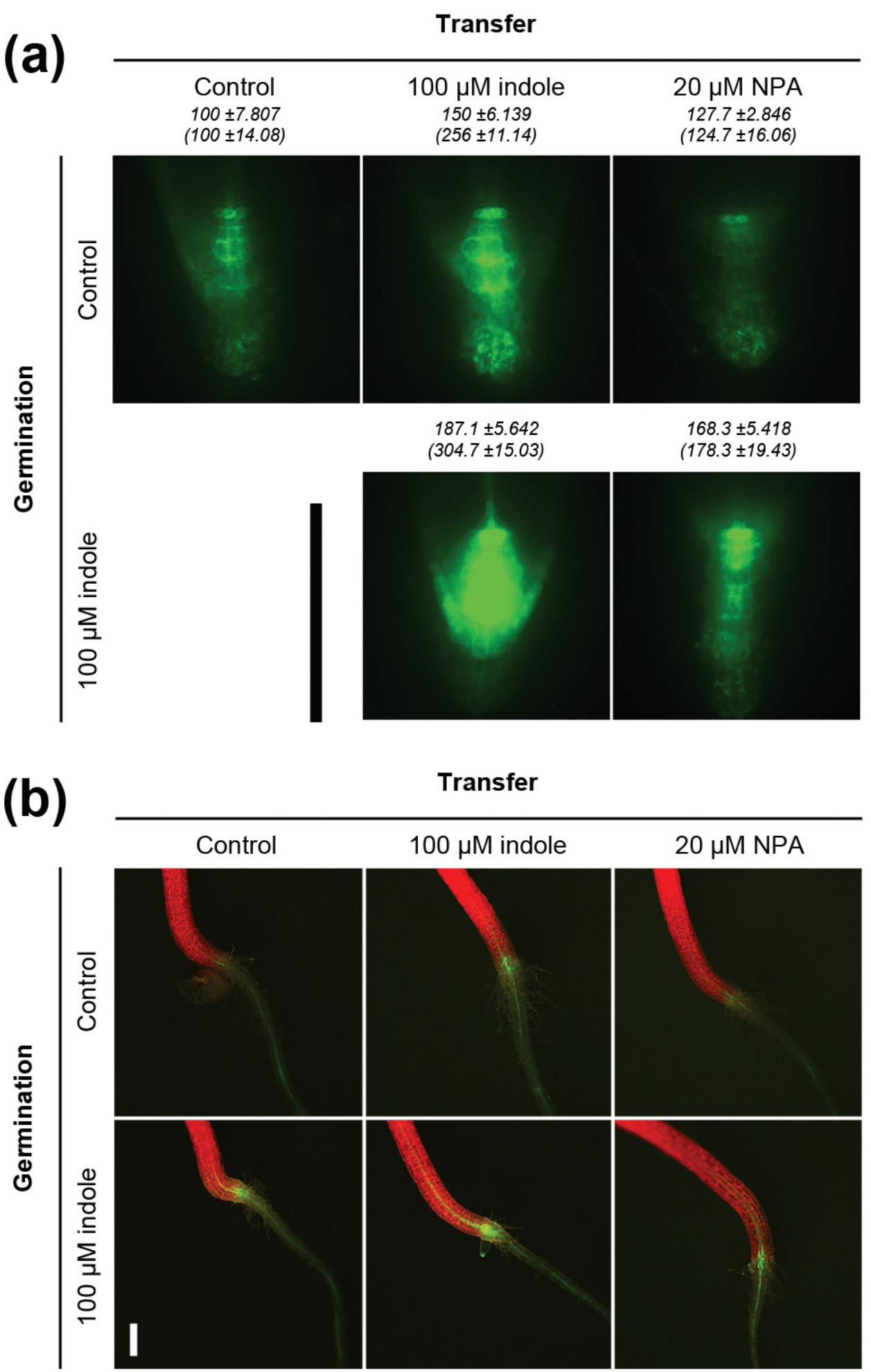
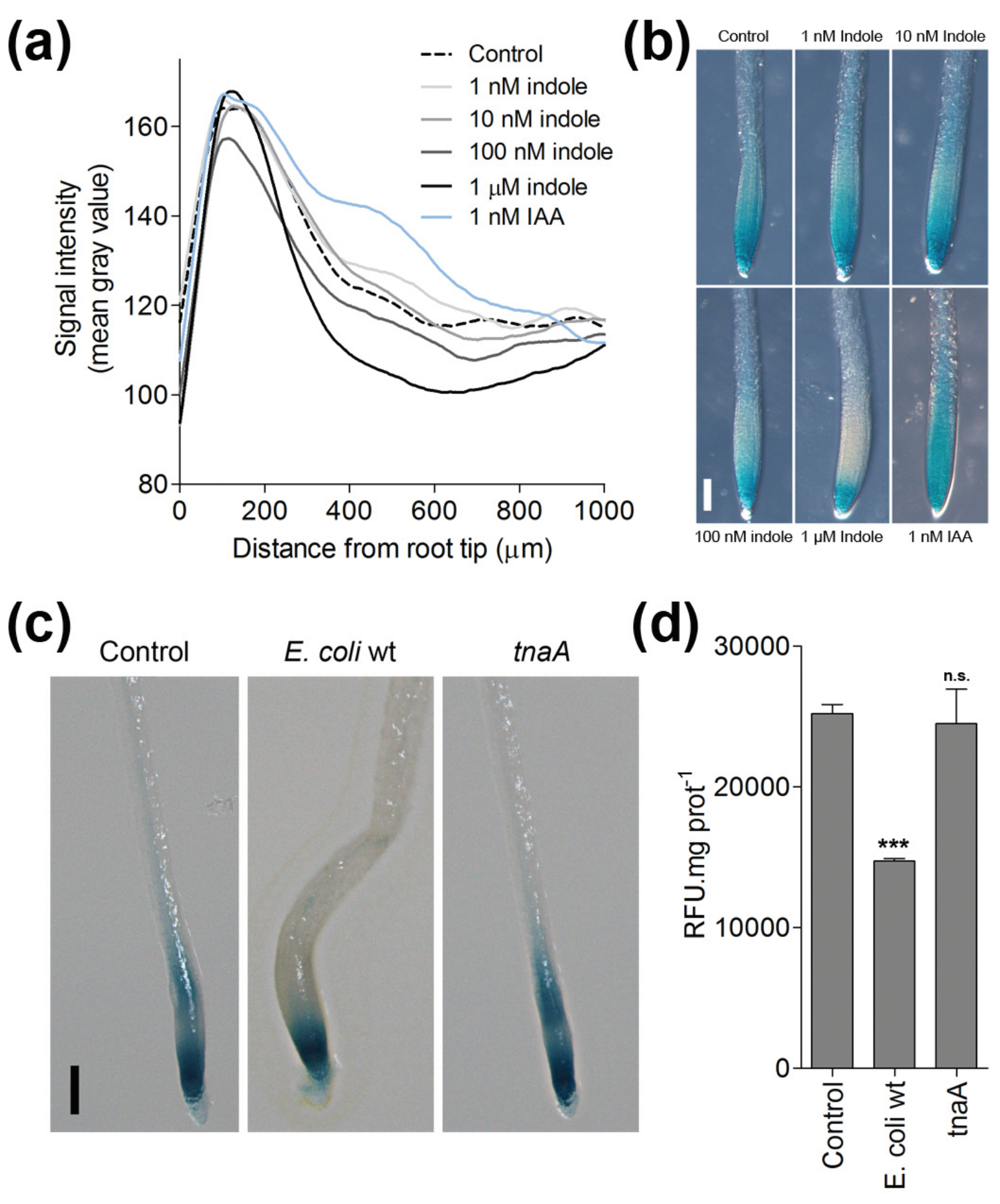

Biomass (mg)
Lateral root number
LR/mm primary root
0
5
10
15
0.1
0.2
0.3
Control
E. coli
B. anthina
B. caledonica
B. caribensis
P. putida ISOf
P. chlororaphis
P. aeruginosa PUPa3
P. fluorescens WCS417r
***
**
*
n.s.
Control
E. coli
B. caledonica
B. anthina
B. caribensis
P. fluorescens WCS417r
P. putida ISOf
P. aeruginosa PUPa3
P. chlororaphis

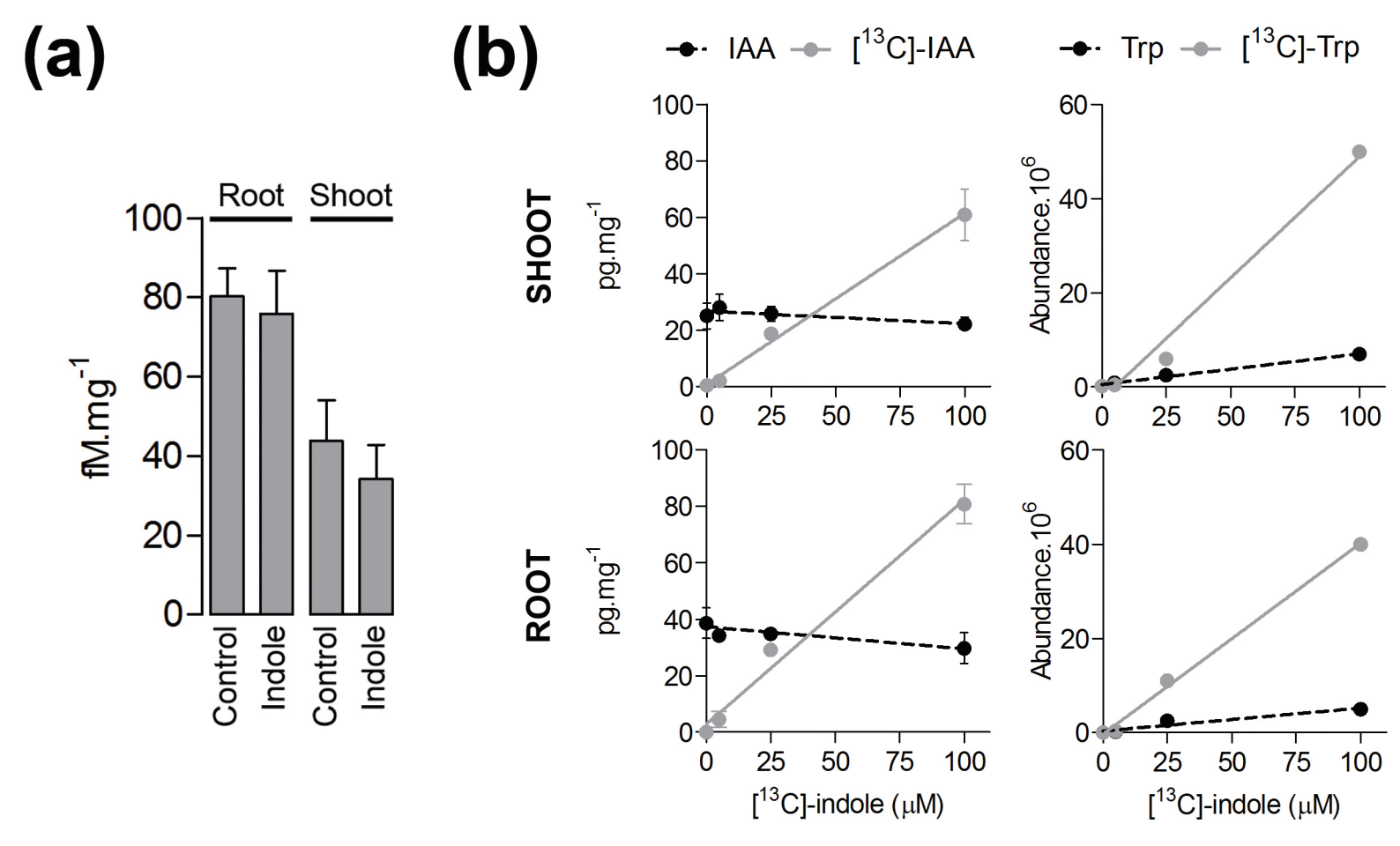

a
b
b
c
10
5
0
Root tip extension (mm)
Intact control
Control
10 μM indole
100 μM indole

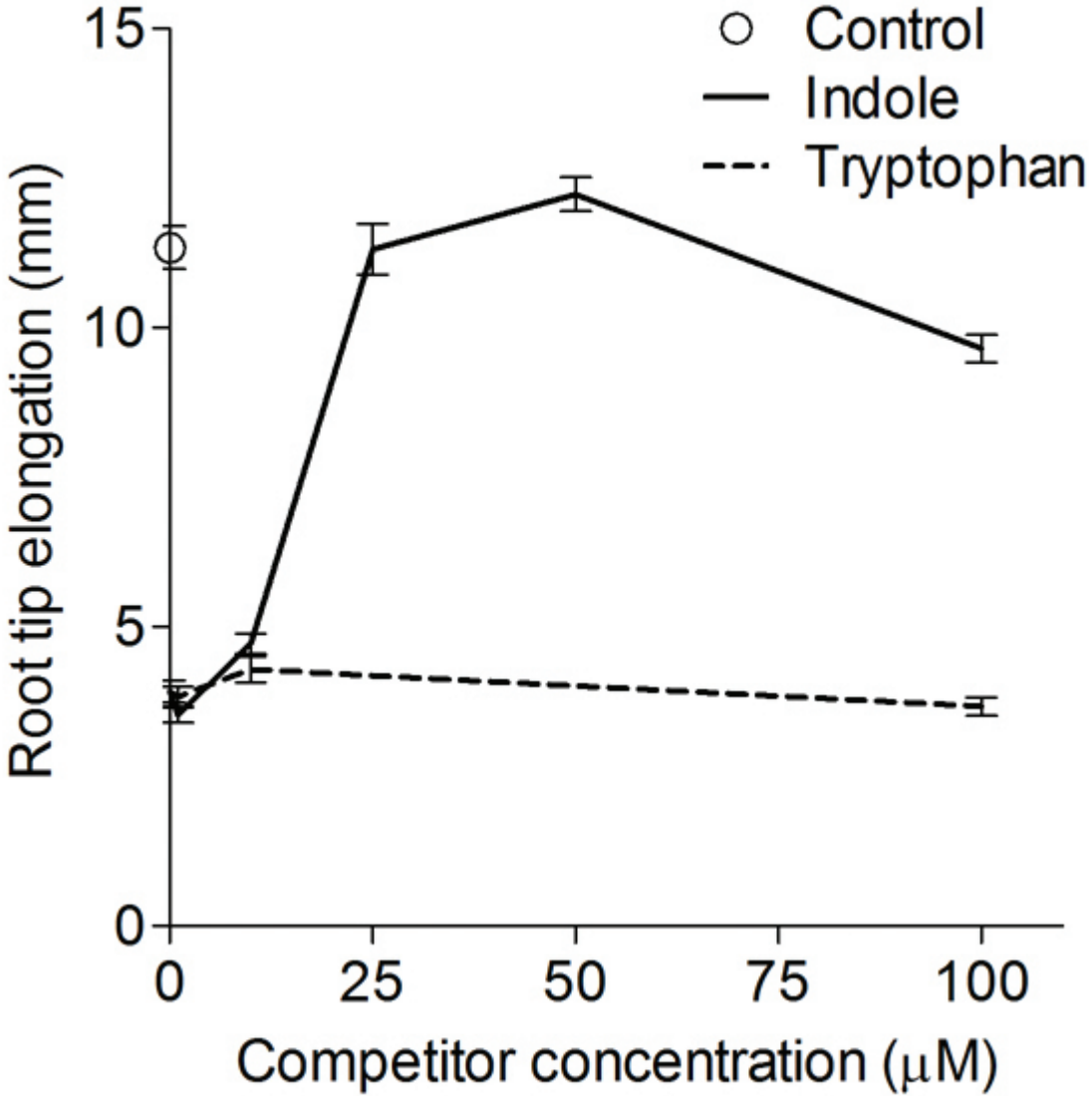

(a)
(b)
Direct application
Volatile source

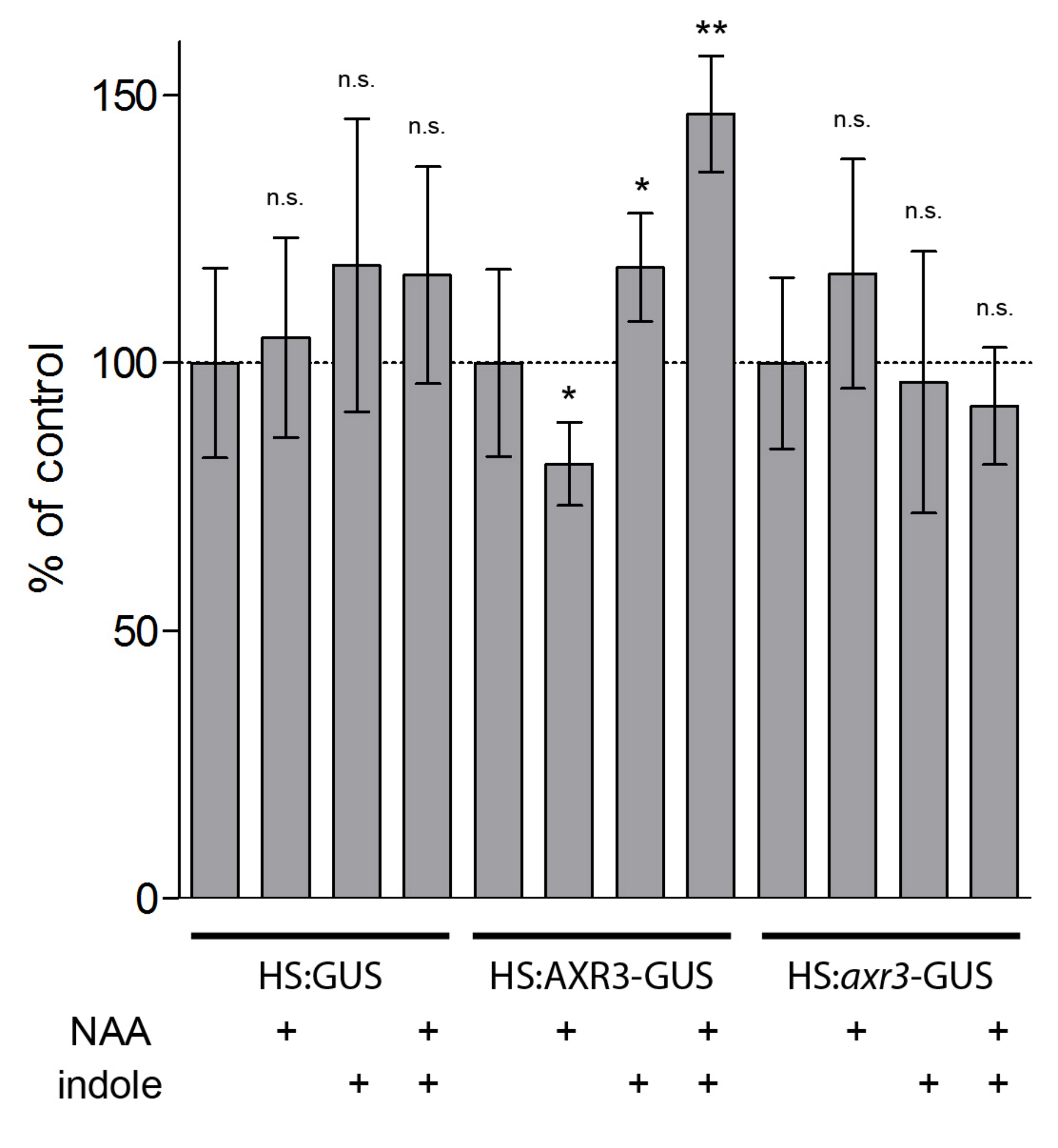

(a)
16.66 %
92.30 %
18.18 %
100.0 %
36.36 %
100.0 %
Adventitious roots number
100 µM indole
Control
1 µM 2,4-D
1 µM NAA
(b)
Lateral root number
indole
IAA
Ctrl
1µM 2,4-D
1µM NAA
1µM IAA
(c)
1 µM 2,4-D
100 µM indole
(d)
Root tip elongation (mm)
100 µM indole
Control
1 µM IAA
1 µM 2,4-D
1 µM NAA
(e)
Control
1 µM 2,4-D
1 µM 2,4-D +100 µM indole
1 µM NAA
1 µM NAA +100 µM indole


(a)
Transfer
Control
100 µM indole
20 µM NPA
100 ±7.807
(100 ±14.08)
150 ±6.139
(256 ±11.14)
127.7 ±2.846
(124.7 ±16.06)
Germination
Control
100 µM indole
187.1 ±5.642
(304.7 ±15.03)
168.3 ±5.418
(178.3 ±19.43)
(b)
Transfer
Control
100 µM indole
20 µM NPA
Germination
Control
100 µM indole


(a)
Control
1 nM indole
10 nM indole
100 nM indole
1 μM indole
1 nM IAA
Signal intensity (mean gray value)
160
140
120
100
80
0
200
400
600
800
1000
Distance from root tip (μm)
(b)
Control
1 nM Indole
10 nM Indole
100 nM indole
1 μM Indole
1 nM IAA
(c)
Control
E. coli wt
tnaA
(d)
RFU.mg prot-1
30000
20000
10000
0
***
n.s.
Control
E. coli wt
tnaA


(a)
Root
Shoot
fM.mg-1
100
80
60
40
20
0
Control
Indole
Control
Indole
(b)
IAA
[13C]-IAA
Trp
[13C]-Trp
SHOOT
ROOT
pg.mg-1
Abundance.10^6
0
25
50
75
100
[13C]-indole (μM)


15
10
5
0
Root tip elongation (mm)
Control
Indole
Tryptophan
0
25
50
75
100
Competitor concentration (μM)


150
100
50
0
% of control
n.s.
n.s.
n.s.
*
*
**
n.s.
n.s.
n.s.
HS:GUS
HS:AXR3-GUS
HS:axr3-GUS
NAA
indole
+
+
+
+
+
+
+
+
+
+
+
+

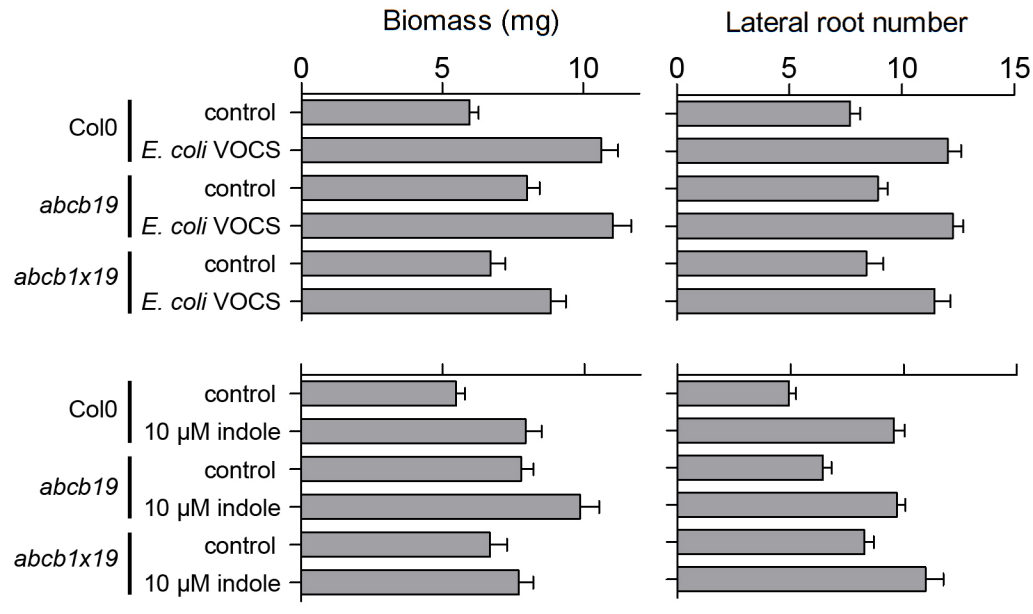

Biomass (mg)
Lateral root number
0
5
10
0
5
10
15
Col0
control
E. coli VOCS
abcb19
control
E. coli VOCS
abcb1x19
control
E. coli VOCS
Col0
control
10 µM indole
abcb19
control
10 µM indole
abcb1x19
control
10 µM indole

Table S1: List of volatile organic compounds emitted by *E. coli* JM105 and corresponding *tnaA* mutant grown on solid agar Luria-Bertani medium.

Compound Number*	Retention time (min)	Compound name	m/z	Retention index *I* (exp.)	Relative amounts	
					E. coli wt	*tnaA*
1	2.83	Dimethyldisulfide	94, 79, 45	774	o	o
2	5.36	3-Methylbutanal oxime , isomer 1	59, 41, 43, 86	858		o
	5.96	3-Methylbutanal oxime , isomer 2	59, 41, 43	878		o
3	7.11	2,5-Dimethylpyrazine	108, 42, 39	913	o	o
4	9.13	Dimethyl trisulfide	126, 79, 45, 64	971	o	o
5	11.54	Benzyl Alcohol	79, 108, 51	1040	o	o
6	12.13	2-Methyl-5-(1-methylethyl)-pyrazine	121, 108, 136, 135	1057		o
7	14.18	Phenylethanol	91, 122, 43	1117		o
8	14.47	Disulfide, methyl (methylthio)methyl	61, 45, 140	1126		o
9	17.18	Dimethyl tetrasulfide	79, 158, 45	1215	o	o
10	19.27	Isobornyl acetate	95, 121, 136	1288		o
11	19.49	2-Undecanone	58, 43, 71, 59	1296		o
12	19.75	Unknown	104, 120, 135	1305		o
13	20.35	Indole	117, 90, 89, 116	1328	xxx	
14	23.13	Unknown	164, 207, 57	1434		o
15	23.70	Geranyl acetone	43, 69, 41	1457	o	o
16	24.07	Unknown	43, 54, 67	1472		o
17	24.69	2-Tridecanone	58, 43, 71, 59	1497		o
18	24.78	Pentadecane	57, 43, 71	1500	o	o
19	29.34	2-Pentadecanone	43, 71, 58, 57	1698	o	o
20	29.80	Unknown	148, 91, 163, 104	1719	o	
21	35.88	Cyclic octaatomic sulfur	64, 256, 128	2025	o	o

o = traces
x = 1-10% relative amount to all peaks
xx = 10-30% relative amount to all peaks
xxx = 30-100% relative amount to all peaks
*Compound numbering refers to Fig. 1b.

Figure S1: Bacterial VOCs remotely affect root growth and development. *A. thaliana* seeds were co-cultured for 21 days after germination with physically separated wild-type *E. coli*, *Burkholderia* or *Pseudomonas* species. Top, emerged lateral root numbers and primary root lengths were monitored after 14 days and shoots were excised after 21 days for biomass determination. Results shown are representative of biological duplicates and are expressed as mean ± s.e.m. Asterisks indicate statistical significance according to one-way ANOVA followed by Dunnet's post-hoc test ($n = 45$, $p < 0.001$). Bottom, representative pictures of 14 dag growth. (n.s., $p > 0.05$; *, $p \leq 0.05$; **, $p \leq 0.01$; ***, $p \leq 0.001$)

Figure S2: Effects of indole on the primary root tip extension of excised seedlings. Seedlings were handled as described in Fig. 2c. Root tip extension was measured 10 days after excision. Results shown are representative of biological duplicates and are expressed as mean ± s.e.m. Letters indicate different statistical significance according to one-way ANOVA followed by Tukey's post-hoc test ($n = 24$, $p < 0.001$).

Figure S3: Volatile indole moves *in planta* and accumulates in sites of auxin action. (a) Agarose beads containing [^{14}C]-indole were applied to either the middle of the root or root-shoot-junction of 15-day-old seedlings and autoradiograms presented here were obtained after 24 h of treatment. Arrows indicate the position of the applied radioactive source. Asterisks emphasize remarkable accumulations of the radioactive signal. Bar = 10 mm. (b) Seedlings were handled as described in (a), except that the agarose bead containing 50 nM [^{14}C]-indole was placed in the middle of the compartment defined by the stainless steel ring. Here are shown representative samples at 5 (left) and 12 (right) days after germination. Asterisks emphasize remarkable accumulations of the radioactive signal. Bar = 10 mm.

Figure S4: indole alters responses to synthetic auxins (a) Adventitious roots number appearing after photostimulation and further growth in light. Percentages above columns represent the proportions of seedlings developing at least one adventitious root on their hypocotyl. Results shown are representative of biological duplicates and are expressed as mean ± s.e.m. Asterisks indicate statistical significance according to Student's t test ($n = 24$, $p < 0.01$). (b) 5 dag seedlings were vertically transferred to fresh plates containing the indicated treatments

and lateral root numbers were counted 8 dat. Results shown are representative of biological duplicates and are expressed as mean ± s.e.m. Asterisks indicate statistical significance when compared to control or hormone treatment alone, according to Student's t test ($n = 20$, $p < 0.01$). (c) Representative micrographs of 2,4-D treatments in (c). Bar = 500 µm. (d) Root tip elongation under the indicated treatments was measured as in Fig. 5c. Results shown are representative of biological triplicates and are expressed as mean ± s.e.m. Asterisks indicate statistical significance according to Student's t test ($n = 12$, $p < 0.01$). (e) Top row, representative fluorescence micrographs of DR5::GFP activity under indicated treatments. 5 dag control-germinated seedlings were vertically transferred to fresh treatment plates and let grow another 5 days. Middle row, representative confocal LASER scanning micrographs of root meristems under indicated treatments. Bottom row, representative micrographs of the root tip morphological changes after treatments under indicated treatments. Arrowheads represent the position of the root tip at the time of transfer. Bars = 200 µm. (n.s., $p > 0.05$; *, $p \leq 0.05$; **, $p \leq 0.01$; ***, $p \leq 0.001$)

Figure S5: Indole treatment increases *DR5::GFP* signal intensity in the root tip and at the root-shoot junction but does not alter tissue distribution. (a) Representative micrographs of the root tip *DR5::GFP* signal of 5-day-old seedlings germinated in control or indole conditions and transferred for 16 h onto fresh growth medium supplemented with the indicated treatments. Numbers above pictures represent the *DR5::GFP* signal mean grey values and integrated densities (in brackets) and are expressed as percentages of control treatment values. Results shown are representative of biological duplicates and are expressed as mean ± s.d. ($n = 15$). Bar = 100 µm. (b) Representative micrographs of the root-shoot-junction *DR5::GFP* signal of 5-day-old seedlings germinated in control or indole conditions and transferred for 16 h onto fresh growth medium supplemented with the indicated treatments. Bar = 200 µm.

Figure S6: Continuous indole treatments trigger apical DR5::GUS signal patterns similar to *E. coli* wt VOCs in primary root tips. (a) Quantification of the root tip *DR5::GUS* signal of 5-day-old seedlings germinated in control, indole or IAA conditions. Results are expressed as means ($n = 15$) (b) Representative micrographs of (a). Bar = 100 µm. (c) Representative micrographs of GUS histochemical staining of primary root tips of seedlings grown for 15 days in the continuous presence or absence of wild-type *E. coli* and *tnaA* mutant VOCs ($n = 20$). Bar

= 200 µm. (d) Enzymatic quantification of DR5 expression in VOCs-treated seedlings. DR5::GUS seedlings were handled as in (c) and 5 mm sections from the root tip of 15 plants were pooled per sample. Results shown are the means ± s.e.m of biological triplicates (n = 9). Asterisks indicate statistical significance according to one-way ANOVA followed by Dunnet's post-hoc test (n = 3, $p < 0.01$). (n.s., $p > 0.05$; ***, $p \leq 0.001$)

Figure S7: Indole can slowly be converted to tryptophan and free IAA. (a), quantification of free IAA contents in seedlings subjected to 24 h 10 µM indole treatments. No statistical difference was detected compared to control treatments according to Student's t-test (n=4, $p < 0.001$). (b) Left, free endogenous and ^{13}C-labelled IAA quantification in seedlings treated with increasing amounts of [^{13}C]-indole for 24 h. Right, relative abundance of endogenous and ^{13}C-labelled tryptophan in corresponding samples. Results shown are expressed as mean ± s.e.m (n = 4, $p < 0.001$).

Figure S8: Indole but not tryptophan releases the primary root tip growth inhibition induced by 50 nM IAA. 5-day-old control-germinated seedlings were handled as in Fig. 5c. Results shown are representative of biological duplicates and are expressed as mean ± s.e.m (n = 30-100).

Figure S9: Indole-auxin co-application prevents auxin-induced AXR3/IAA17 degradation. HS::AXR3-GUS reporter lines were handled as described in the text. Results shown are representative of biological duplicates and are expressed as mean ± s.e.m. Asterisks indicate statistical significance according to Student's t test when compared to control treatmnes (n = 4, $p < 0.01$). (n.s., $p > 0.05$; *, $p \leq 0.05$; **, $p \leq 0.01$).

Figure S10: the auxin transport mutants *abcb19* and *abcb1x19* respond similarly to *E. coli* VOCs and indole treatments. Mutant and wt seedlings were handled as in Fig. 1a. Results shown are representative of biological duplicates and are expressed as mean ± s.e.m. Each treatment result was found significantly different to control treatment in their respective background according to Student's t test (n = 30-45, $p < 0.001$).