Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Supporting Information:

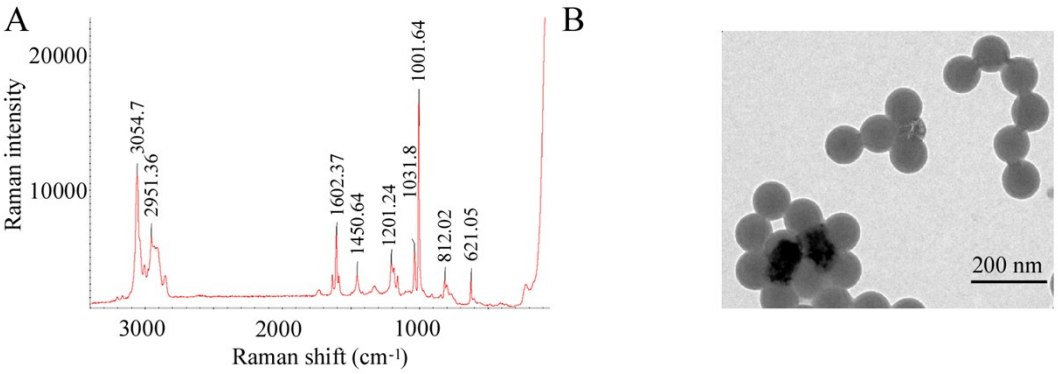
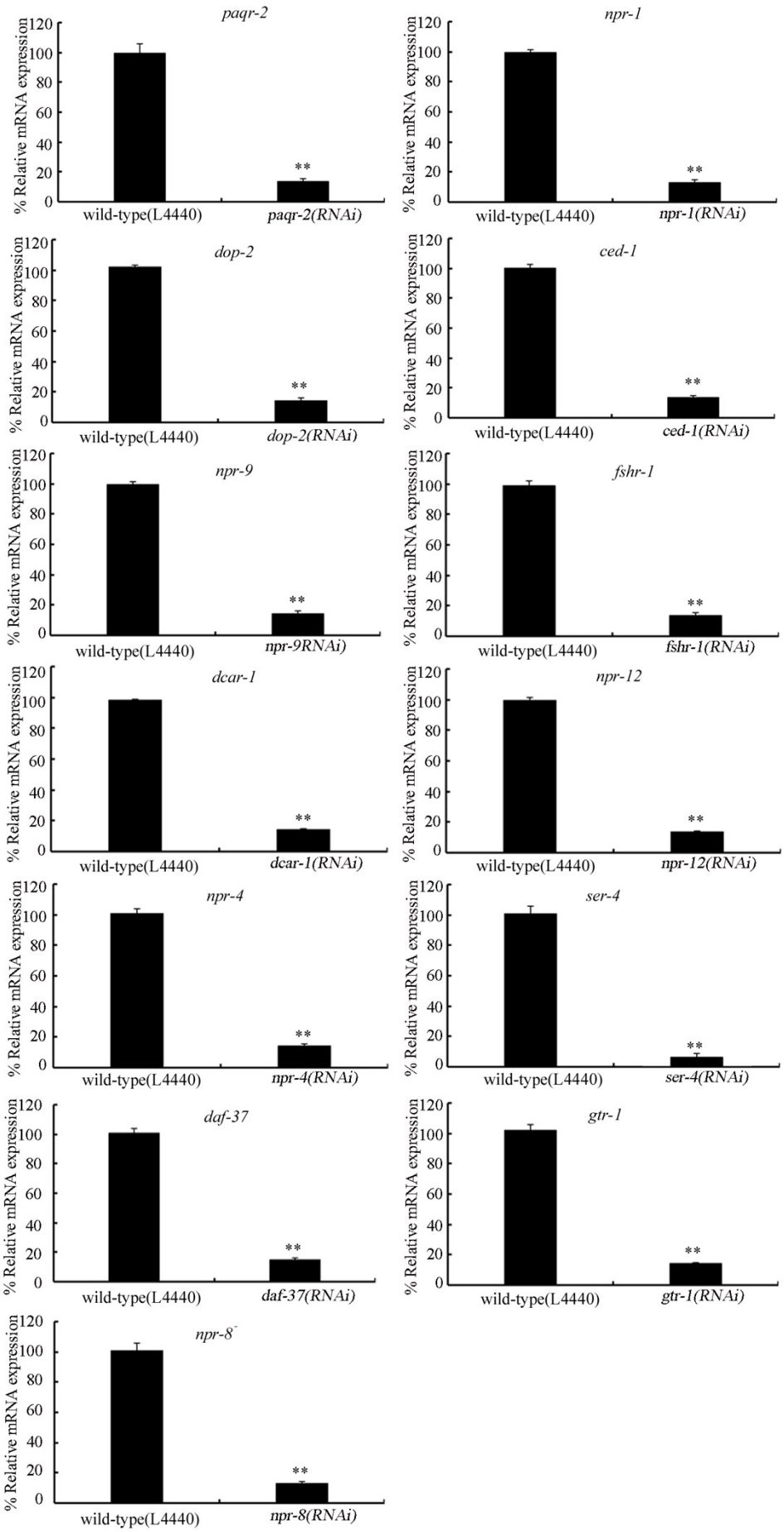


Figure S1. Properties of nanopolystyrene. (A) Raman spectroscopy of nanopolystyrene particles. The Raman spectroscopy analysis indicated that the nanopolystyrene showed the peaks at 1001.64 cm^{-1} (breathing vibration of benzene ring), at 1031.8 cm^{-1} (symmetric extension vibration of carbon atoms in benzene ring), at 1201.24 cm^{-1} (stretching vibration of carbon atoms between benzene ring and polyethylene group), at 1450.64 cm^{-1} (asymmetric bending vibration of hydrogen atoms), and at 1602.37 cm^{-1} (asymmetric stretching vibration of benzene ring carbon atoms). (B) TEM image of nanopolystyrene particles in K medium before the sonication.


paqr-2
% Relative mRNA expression
120
100
80
60
40
20
0
**
wild-type(L4440)
paqr-2(RNAi)
npr-1
% Relative mRNA expression
120
100
80
60
40
20
0
**
wild-type(L4440)
npr-1(RNAi)
dop-2
% Relative mRNA expression
120
100
80
60
40
20
0
**
wild-type(L4440)
dop-2(RNAi)
ced-1
% Relative mRNA expression
120
100
80
60
40
20
0
**
wild-type(L4440)
ced-1(RNAi)
npr-9
% Relative mRNA expression
120
100
80
60
40
20
0
**
wild-type(L4440)
npr-9RNAi)
fshr-1
% Relative mRNA expression
120
100
80
60
40
20
0
**
wild-type(L4440)
fshr-1(RNAi)
dcar-1
% Relative mRNA expression
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100
80
60
40
20
0
**
wild-type(L4440)
dcar-1(RNAi)
npr-12
% Relative mRNA expression
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100
80
60
40
20
0
**
wild-type(L4440)
npr-12(RNAi)
npr-4
% Relative mRNA expression
120
100
80
60
40
20
0
**
wild-type(L4440)
npr-4(RNAi)
ser-4
% Relative mRNA expression
120
100
80
60
40
20
0
**
wild-type(L4440)
ser-4(RNAi)
daf-37
% Relative mRNA expression
120
100
80
60
40
20
0
**
wild-type(L4440)
daf-37(RNAi)
gtr-1
% Relative mRNA expression
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100
80
60
40
20
0
**
wild-type(L4440)
gtr-1(RNAi)
npr-8
% Relative mRNA expression
120
100
80
60
40
20
0
**
wild-type(L4440)
npr-8(RNAi)

Figure S2. qRT-PCR analysis of the efficiency of RNAi knockdown of *paqr-2*, *npr-1*, *dop-2*, *ced-1*, *npr-9*, *fshr-1*, *dcar-1*, *npr-12*, *npr-4*, *ser-4*, *daf-37*, *gtr-1*, and *npr-8* in wild-type nematodes. L4440, empty vector. Bars represent means ± SD. $^{**}P < 0.01$ *vs* wild-type.

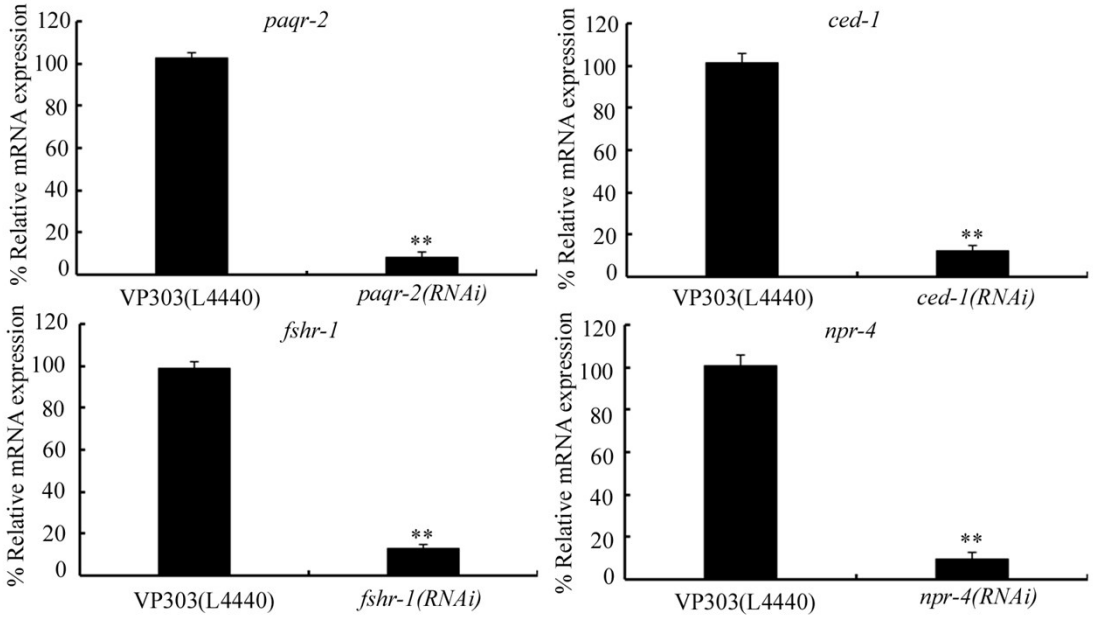

Figure S3. qRT-PCR analysis of the efficiency of intestine-specific RNAi knockdown of *paqr-2*, *ced-1*, *fshr-1*, and *npr-4*. L4440, empty vector. Bars represent means ± SD. $^{**}P < 0.01$ *vs* VP303.

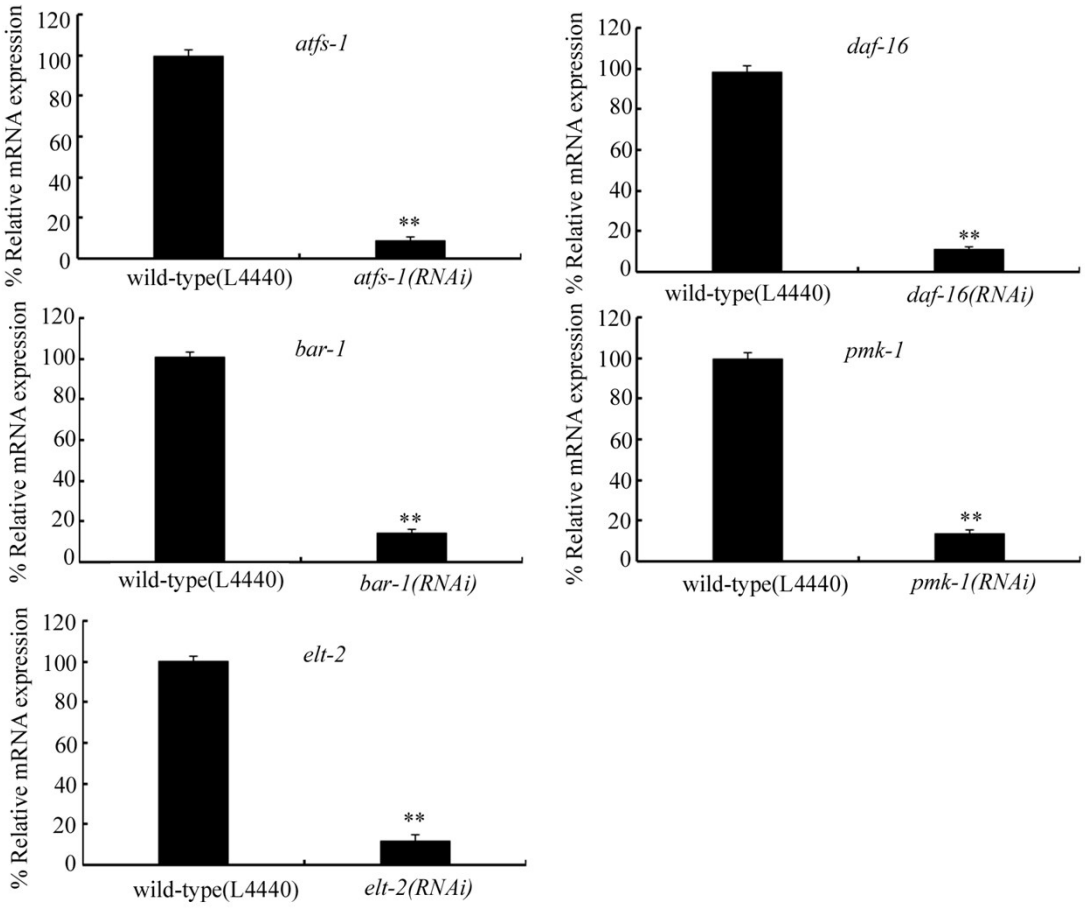

Figure S4. qRT-PCR analysis of the efficiency of RNAi knockdown of *bar-1*, *elt-2*, *pmk-1*, *daf-16*, or *atfs-1*. Bars represent means ± SD. $^{**}P < 0.01$ *vs* wild-type.

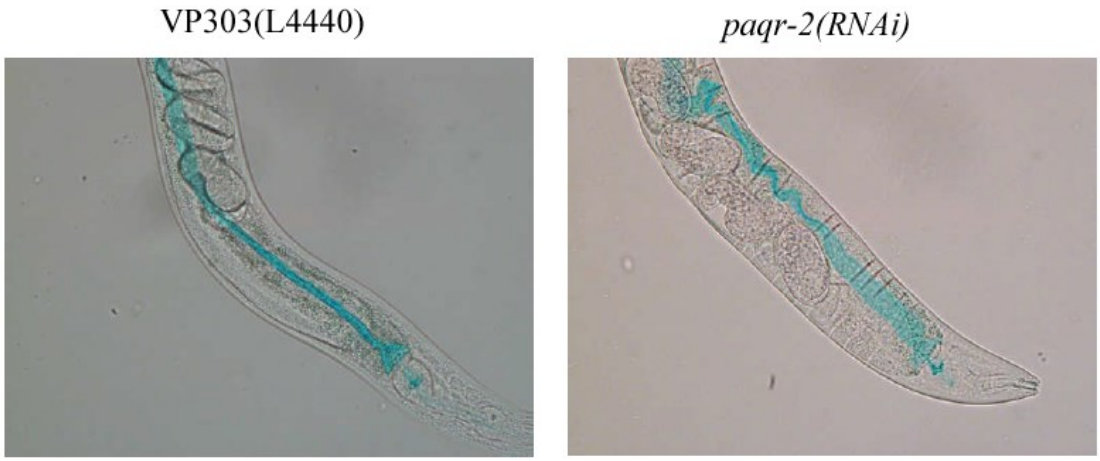

Figure S5. Effect of intestinal RNAi knockdown of *paqr-2* on intestinal permeability based on the erioglaucine disodium staining. The nematodes were stained by 5% erioglaucine disodium (a blue dye) for 3 h. L4440, empty vector.

Table S1. Primer information for qRT-PCR

Gene	Forward primer (5'-3')	Reverse primer (5'-3')
paqr-2	TGTCGAGGACAGCACAACTG	GCCCTCCCTTTTTACGACGA
seb-3	TAACTCCGCTGCCTCTTTGG	CAAATGGAGTCCCTGGGCAT
avr-14	TCATCGTCTCGTGGGTCTCT	TGTACCCTTCTGTTGGGAGC
avr-15	ATAGGTCGATTGCGGAGAGG	CAAAACCCGCCAGAAGCAAT
glc-1	AGTCACCACGCTGCTTACAA	GTTCTGCTGGCCAAAACGAG
npr-1	GGAGACCGGCGTAAAAGTGA	ATTCTTCCGGCTCAGCAACA
dop-2	AGCAGAAGTACGACGGCAAA	CTTGCGAAACACGTCGACTC
dop-3	ATGTTGGCTGGACAACACCA	AGTGCTTGATACACGTGGCA
ser-7	GCGGGCCAATTCAACAAACT	AGCTGGAAGATTGGGTTCGG
mgl-1	TTGGCTTGCATCAGAGTCGT	TGGCGTGGCATATTTCAGGT
mgl-2	GGTAGGAGCACTTCTGGCTG	GTAGCTTGAGACAGCGCGAG
ced-1	GCTGGACGGGGAAATAACGA	GTCGTTACTGCATGTGCTGG
npr-9	CTTTCCCGAGTGGACATGCT	GCACGTTGACCGTTTTTCCA
fshr-1	TTGGTGGATGGCTTTTTGCG	ACGGTCTTCTTCGCGAGTTT
dcar-1	TGGATGGGCAATGCTTCCAT	ACCACCATGTCGCGGTTTAT
glp-1	GAAGTGCCCTTCATGAGGCT	TCGGTGTTCTTCCGTCTTCG
npr-12	TCTACCACTTGCTGCCTTGG	GCTGCTGTACCGGTAGTTGT
unc-63	TTCTCATGACACGACCGCAA	GGCAACACTTTCGACAGCAG
srh-220	AGTCGTCGGGTGCTCAATTA	TTCGATGTTCAGGTCCAGGC
npr-4	GTAGTCGCATTCGCTTGCAG	TCATTGCCGACTTTTTGCGG
npr-2	ATACACGTGTTGAGGCTCCG	GCAGGGAGAATGTGACAAGGA
frpr-4	ATACACGTGTTGAGGCTCCG	GCAGGGAGAATGTGACAAGGA
unc-68	AGGAGGCGAACAGGATGATG	CCGCGTGTCCGTATAACAGT
ser-4	CAGACCGTAATCCTCGCCTC	AATTGAGGCAGTGCAGACGA
daf-37	ATCACCGTTGCAGTCACGAT	CGAGGACCAGTGTAGCTTCC
gtr-1	CGTCGCAAACCTCGCTTTAG	CGGCACAATTGCGCATATCA
lin-12	CGGATCATACGGCTCGTCAA	TCGGAGTATCGCGTCATTGG

tkr-1	CTGCTGGCTTCCATACCACA	TCACCGTTCATGGCAACTCA
npr-8	CCGAAGCTACGGATGGAGAC	ACCAAAGAGCCGCATAGCTT
age-1	ATGGAAACCGCCGAGTGT	ATTGGCAGTCGGTTCAGG
daf-16	AGGTGTTACACGTGGCCAAT	TGGCTTCTTACGACAACGCT
sod-3	TCTCCAACCAGCGCTGAAAT	CAAGTAGTAGGCGTGCTCCC
bar-1	CCTAATTTGCACGCTACGGC	TATGACCATCGCCCATTCGG
pmk-1	CGACTCCACGAGAAGGAT	ATATGTACGACGGGCATG
mdt-15	AGCGAAGAGGATTGGCCTTC	CCAGCCGGAGTGTTTCCTAA
sbp-1	ACCGTACCCGGAACCAATTC	TCCCTTCCCAGAAAAGCGTC
atf-7	GCTGAAAAGAATCAATTACTGACAC	CGTGCTGCTCATCACTCATTG
skn-1	AGTGCTTCTCTTCGGTAGCC	ATCCGTTGATCATCACGCCA
elt-2	GGAAGTGCAAAAGCAGACCG	TCATCAACCCAGCTGTAGCG
nhr-8	ACAACAGCTGTGAACAGTCC	CGCCGGAGAAACTGTGTAGT
hsp-4	TGGCAAACGCGTACTGTGAT	ATCTTGAACGGCCAGTGCTT
hsp-6	CTTGAAGCTCACCAGAGCCA	GGCGATTTGGGAGGACTTGA
lgg-1	CCGAAGGAGACAAGATCCGC	TTCCTCGTGATGGTCCTGGT
hlh-30	ATTTCCAACGAGACGCTTGC	GGAGATGGTGACTTGCTGCT
atfs-1	CACAACTTTTGGTGCCCAGG	TAGGATCTCTGCCGCAAACC
tba-1	TCAACACTGCCATCGCCGCC	TCCAAGCGAGACCAGGCTTCAG

Table S2. Primer information for DNA constructs

	Forward primer (5'-3')	Reverse primer (5'-3')
P*ges-1*	ATATCTAGAAGCCACTCAGCCACTTCA	ATAGGATCCCATCTGAATTCAAAGATA
paqr-2/Y32H12A.5.1	ATACCCGGGATGGAGGAAGATGACGTG	ACGGGTACCTCATAAACCAACATCCGC
fshr-1/C50H2.1a.1	ATACCCGGGATGACATGCTCAACATAT	GCGGGTACCCTAAGAACAATCAGAAAC

Table S3. Expression patterns of some genes encoding GPCRs (https://wormbase.org)

Gene	Intestine	Neurons	Germline
pqar-2	+	+	+
npr-1		+	
ced-1	+	+	+
fshr-1	+	+	
dcar-1		+	
ser-4		+	
daf-37		+	
dop-2		+	
npr-9		+	
npr-12		+	
npr-4	+	+	
gtr-1		+	
npr-8		+	