Table S1. Strains and plasmids. The genotypes of all strains of *E. coli* utilized or constructed in this study and information about the plasmids used in this study.

Bacterial strains and plasmids	Genotype or relevant characteristics	Source or Reference
Bacterial strains		
E. coli DH5α	Plasmid propagation strain	Invitrogen
E. coli S17-λpir	RK2 tra regulon, pir, host for pir-dependent plasmids	[1]
E. coli fnr-771(del)::kan	F-, Δ(*araD-araB*)567, Δ*lacZ*4787(::rrnB-3), λ-, Δ*fnr*-771::kan,rph-1, Δ(*rhaD-rhaB*)568, *hsdR*514	[2]
UPEC CFT073	Blood isolate from a patient with acute pyelonephritis	[3]
LMP10	CFT073 Δ*lacZYA*	[4]
LMP11	CFT073 Δl*acZYA*::Chlr	[4]
	CFT073 Δ*fnr*	This study
	CFT073 Δ*fnr::kan*	This study
CFT073 ^{OFF}	IRL, fim invertible element locked off	[5]
CFT073 ^{ON}	IRL, fim invertible element locked on	[5]
	CFT073 Δ*lacZYA* Δ*fnr*	This study
	CFT073 Δ*lacZYA fimA-lacZ*	This study
	CFT073 Δ*lacZYA* Δ*fnr fimA-lacZ*	This study
	CFT073 Δ*lacZYA fimB-lacZ*	This study
	CFT073 Δl*acZYA* Δ*fnr fimB-lacZ*	This study
	CFT073 Δ*lacZYA fimE-lacZ*	This study
	CFT073 Δl*acZYA* Δ*fnr fimE-lacZ*	This study
	CFT073 Δ*lacZYA papA-lacZ*	This study
	CFT073 Δ*lacZYA* Δ*fnr papA-lacZ*	This study
	CFT073 Δ*lacZYA papB-lacZ*	This study
	CFT073 Δl*acZYA* Δ*fnr papB-lacZ*	This study
	CFT073 Δ*lacZYA* c5038-lacZ	[4]
	CFT073 Δ*lacZYA* Δ*fnr* c5038-lacZ	This study
	CFT073 Δ*lacZYA kguS-lacZ*	[4]
	CFT073 Δl*acZYA* Δ*fnr kguS-lacZ*	This study
	CFT073 Δ*lacZYA kguR-lacZ*	[4]
	CFT073 Δl*acZYA* Δ*fnr kguR-lacZ*	This study
	CFT073 Δ*lacZYA hlyA-lacZ*	This study
	CFT073 Δ*lacZYA* Δ*fnr hlyA-lacZ*	This study
	CFT073 Δ*lacZYA* c3565-lacZ	This study
	CFT073 Δ*lacZYA* Δ*fnr* c3565-lacZ	This study
	CFT073 Δ*lacZYA fliA-lacZ*	This study
	CFT073 Δ*lacZYA* Δ*fnr fliA-lacZ*	This study
	CFT073 Δ*lacZYA fliC-lacZ*	This study
	CFT073 Δ*lacZYA* Δ*fnr fliC-lacZ*	This study
	CFT073 Δ*lacZYA flhDC-lacZ*	This study
	CFT073 Δ*lacZYA* Δ*fnr flhDC-lacZ*	This study

Plasmids		
pET28a-(fnrD154A)2	expression plasmid of FNR protein	[6]
pVIK112	suicide plasmid for chromosomal lacZ transcriptional fusion	[7]
pGEN-MCS	low copy plasmid for complementation	[8]
pGEM-FNR	pGEN-MCS carrying fnr coding region and 500bp upstream promoter region	This study
pKD3	template for λ-Red Chlr cassette	[9]
pKD4	template for λ-Red Kanr cassette	[9]
pCP20	encodes FLP recombinase for removal of resistance cassette	[9]
pKD46	λ-Red recombinase expression	[9]

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Table S2. Oligonucleotides. Oligonucleotide sequences used as PCR primers.

Primers	Sequence (5'-3')
General PCR for cloning	
pGEN-FNR-F	GTACCATATGGATCGAATCCCATCAGCATC
pGEN-FNR-R	CCGAGTCGACAGGATCGATAACAACGAGCA
For lacZ fusion	
fimA-lacZ-5'-F	CACGGAATTC GTTGATGCAGGCTCTGTTGA
fimA-lacZ-5'-R	GCAGTCTAGA TTATTGATACTGAACCTTGA
fimB-lacZ-5'-F	GTCGGAATTCCCGATTGAGGATTTCGGATA
fimB-lacZ-5'-R	CCAGTCTAGACTATAAAACAGCGTGACGCT
fimE-lacZ-5'-F	GACGGAATTCGGCATGGGATGCGTATTAGT
fimE-lacZ-5'-R	CGAGTCTAGATCAAACTTCTTCTCTTTTTA
papA-lacZ-5'-F	CACGGAATTCATCAGTCGGTCAGGAAATGC
papA-lacZ-5'-R	GCAGTCTAGAGAGCAGCATATGCACCAAAA
papB-lacZ-5'-F	CACGGAATTC GGCCCCTGGATATATGCTTC
papB-lacZ-5'-R	GCAGTCTAGA CTCCATCATGCCTGTTCAGA
c5038-lacZ-5'-F	AGTCGAATTCTGGTGGTAATGCGGAAGAAC
c5038-lacZ-5'-R	ATCGTCTAGATATCGCCCAGTGGCAGAAGG
kguS-lacZ-5'-F	ATGCGAATTCTTCGCTTTCTGGCGAGAAGG
kguS-lacZ-5'-R	GCTGTCTAGAGAAACCGCGAGCATGATAAG
kguR-lacZ-3'-F	ATCGGAATTCTGTTATTGCAGCGACCAAGG
kguR-lacZ-3'-R	GCACTCTAGATTAGCTGGATGATTCTGGTC
hlyA-lacZ-5'-F	ATCGGAATTCTATTGATTTCCGGGAT
hlyA-lacZ-5'-R	ACCGTCTAGATTATGCTGAGCTGTC
c3565-lacZ-5'-F	GCTGTCTAGAGAAACCGCGAGCATGATAAG

c3565-lacZ-5'-R	ATCGGAATTCTGTTATTGCAGCGACCAAGG
hlyD-lacZ-5'-F	CACGGAATTC TTCGGGAAAAGTTCAGCAAC
hlyD-lacZ-5'-R	GCAGTCTAGA TTAACGCTCATGTAAACTTTCT
fliA-lacZ-3'-F	CACG CCCGGG ATCAGGCCTACAAGGGGAAT
fliA-lacZ-3'-R	GCAGTCTAGA GCGTTCGACGGCATTAAGTA
fliC-lacZ-3'-F	CACGGAATTC CGACACGTAAAACGAATACCG
fliC-lacZ-3'-R	GCAGTCTAGA CGCAGACTGGTTCTTGTTGA
flhDC-lacZ-3'-F	CACGGAATTC CGGTGAGACCGCATAAAAAT
flhDC-lacZ-3'-R	GCAGTCTAGA CCCAGGTCATAAACCAGTCG

For Deletion[a]

Del-fnr-F	GACGGTTATGCCAGACCACT
Del-fnr-R	AAGCGACAAGCTTCGTGAAT

For ON/OFF switch

fimEin F	GGCATGCTTGTGGTTATGAA
fimAin R	TTTTCATGCTGCTTTCCTTT

For EMSA

Inside negative control-For1	ATCTGTGTGGTAAGAGAATC
Inside negative control-Rev1	TGGTGCGCCATGGGATATTG
PromfimI-For	TTTGCAGAGCCAGTACGTTG
PromfimI-Rev	GTTGATGCAGGCTCTGTTGA
PrompapI-For	TTCACCCGTTTTTCAGAAGC
PrompapI-Rev	AAAATCCGCACACTGACCAT
PromkguR-For	AAGCCATAACGTTCCGCTTC
PromkguR-Rev	TTGCTACTGTTTGCCGCTAC

Prom3565-For	CAGCGTAACCACAGAGGATG
Prom3565-Rev	CGCAACAGAGCTGCAATATC
PromfliC-For	CGCAGACTGGTTCTTGTTGA
PromfliC-Rev	GGGAATAAGGGGCAGAGAAA
PromydfZ-For	GCGACTGGTTTAGCGAAGAG
PromydfZ-Rev	TGGTGATTGCGTTACGGTTA

- Underlined are restriction cutting sites;
- Capital letters represent homologous fragments of the deleted genes.