Supplemental Data

Table S2. Accession numbers and sequence variations of NAT members homologous to XanQ

Species	gene ID	length (residues)	identity (%)	similarity(%)	gaps(%)
Escherichia coli str. K-12	XANQ_ECOLI	466/466	100	100	0
Edwardsiella ictaluri	C5BEY4_EDWI9	472/469	82	90	1
Aeromonas hydrophila	AERHH A0KK97	505/453	79	89	0
Neisseria flavescen	C5TJD9_NEIFL	463/438	69	86	0
Neisseria meningitidis	C6SF50_NEIME	463/438	69	86	0
Neisseria sicca	C6M9W3_NEISI	463/438	69	87	0
Eikenella corrodens	C0DRV2_EIKCO	458/441	67	83	0
Neisseria gonorrhoeae	B4RL43_NEIG2	354/341	65	83	1
Bacteroides caccae	A5ZL53_9BACE	438/440	49	68	2
Bacteroides ovatus	A7M586_BACOV	437/440	49	68	2
Parabacteroides distasonis	A6LC44_PARD8	441/440	49	65	2
Bacteroides sp.	C6IL21_9BACE	436/440	48	68	2
Bacteroides thetaiotaomicron	Q89ZA4_BACTN	436/440	48	68	2
Parabacteroides johnsonii	B7BCR2_9PORP	456/440	48	65	2
Pseudomonas fluorescens	C3KAR9_PSEFS	475/439	48	68	0
Bacteroides fragilis	Q64QA9_BACFR	441/442	47	66	3
Bacteroides plebeius	B5CUV5_9BACE	444/436	47	65	2
Parabacteroides merdae	A7AKM1_9PORP	456/440	47	66	2
Porphyromonas gingivalis	Q7MT43_PORGI	445/441	47	65	2
Pseudomonas fluorescens	Q3KD41_PSEPF	488/439	47	68	0
Synechococcus sp.	B4WIL3_9SYNE	470/463	47	67	0
Azotobacter vinelandii	C1DM49_AZOVD	434/413	46	65	0
Bacteroides dorei	B6W3N9_9BACE	443/445	46	65	2
Bacteroides sp.	C3R636_9BACE	443/445	46	65	2
Bacteroides stercoris	B0NNN1_BACSE	439/439	46	66	2
Bacteroides vulgatus	A6L3C4_BACV8	443/445	46	65	2
Bordetella avium	Q2KYY5_BORA1	467/438	46	66	0
Dickeya dadantii	C8QTQ0_DICDA	462/445	46	66	0
Dickeya zeae	C6CQ69_DICZE	462/442	46	66	0
Erwinia carotovora	Q6DB65_ERWCT	462/440	46	66	0
Erwinia tasmaniensis	B2VFB1_ERWT9	462/445	46	66	0
Moritella sp.	A6FAB8_9GAMM	423/408	46	66	1
Proteus mirabilis	B4EZA8_PROMH	463/440	46	66	0
Providencia alcalifaciens	B6XH30_9ENTR	462/441	46	66	0
Pseudomonas aeruginosa	B7V283_PSEA8	468/439	46	66	0
Pseudomonas fluorescens	Q4KIR0_PSEF5	479/439	46	66	0
Pseudomonas mendocina	A4XW01_PSEMY	500/439	46	66	0
Pseudomonas putida	B1JBD2_PSEPW	459/446	46	66	4
Vibrio vulnificus	Q8DDV0_VIBVU	467/439	46	68	0
Yersinia bercovieri	C4S0H2_YERBE	461/440	46	66	0
Yersinia enterocolitica	A1JHV2_YERE8	461/440	46	66	0
Yersinia frederiksenii	C4SRZ9_YERFR	461/440	46	66	0
Yersinia intermedia	C4T5T9_YERIN	461/440	46	66	0
Yersinia kristensenii	C4TZT3_YERKR	461/440	46	66	0
Yersinia mollaretii	C4SDP3_YERMO	472/440	46	66	0
Yersinia pestis	Q0WKQ8_YERPE	461/440	46	66	0
Yersinia pseudotuberculosis	Q66GF1_YERPS	461/440	46	66	0
Yersinia ruckeri	C4UL97_YERRU	479/440	46	66	0
Aeromonas salmonicida	A4SKE4_AERS4	465/441	45	66	0
Aurantimonas	gb|EAS48987.1	464/441	45	66	0

Burkholderia cepacia	B4EG80_BURCJ	429/424	45	66	0
Citrobacter koseri	A8ARP1_CITK8	468/440	45	66	0
Dickeya dadantii	C6C697_DICDC	462/442	45	66	0
Enterobacter cancerogenus	B6FFT6_9ENTR	463/440	45	66	0
Enterobacter sakazakii	A7MQC0_ENTS8	468/440	45	65	0
Escherichia albertii	B1EHY8_9ESCH	463/440	45	65	0
Escherichia coli O157:H7	YICE_ECO57	463/440	45	65	0
Escherichia fergusonii	B7LVL7_ESCF3	463/440	45	65	0
Klebsiella pneumoniae	B5XTD2_KLEP3	463/442	45	66	0
Manganese-oxidizing bacterium	Q1YFI6_MOBAS	464/441	45	66	0
Pantoea sp.	C8QC53_9ENTR	459/442	45	66	0
Pectobacterium carotovorum	C6DJC9_PECCP	462/440	45	66	0
Pectobacterium wasabiae	C6NCY9_9ENTR	462/440	45	66	0
Photorhabdus asymbiotica	C7BGV4_9ENTR	461/440	45	67	0
Prevotella melaninogenica	C5VGX0_9BACT	447/438	45	65	0
Providencia stuartii	B2PUP3_PROST	460/443	45	66	1
Pseudomonas entomophila	Q1IBC2_PSEE4	459/439	45	66	0
Pseudomonas mendocina	A4XYN0_PSEMY	458/439	45	66	0
Pseudomonas putida	B0KLW0_PSEPG	459/444	45	66	0
Pseudomonas syringae	Q48D16_PSE14	465/458	45	65	0
Salmonella arizonae	A9MKL8_SALAR	466/440	45	66	0
Serratia proteamaculans	A8GLH5_SERP5	466/440	45	66	0
Shewanella halifaxensis	B0TLJ0_SHEHH	482/449	45	70	0
Shigella dysenteriae	B3WW71_SHIDY	463/440	45	65	0
Vibrio campbellii	A8T6H7_9VIBR	463/443	45	67	0
Vibrio cholerae	A2PTP7_VIBCH	468/446	45	67	0
Yersinia aldovae	C4UBZ6_YERAL	461/440	45	65	0
Yersinia rohdei	C4UTL8_YERRO	461/440	45	66	0
Acinetobacter radioresistens	C6RL26_ACIRA	456/452	44	66	1
Acinetobacter sp.	Q6FE95_ACIAD	457/438	44	66	0
Aeromonas hydrophila	A0KHR3_AERHH	465/441	44	65	0
Burkholderia ambifaria	Q0BA61_BURCM	462/438	44	65	0
Burkholderia cenocepacia	Q1BMA6_BURCA	462/446	44	65	0
Burkholderia multivorans	A9ALZ0_BURM1	462/446	44	65	0
Burkholderia sp.	Q394B7_BURS3	462/446	44	65	0
Burkholderia thailandensis	Q2SZT8_BURTA	462/445	44	66	0
Citrobacter sp.	C1MDV6_9ENTR	463/440	44	65	0
Citrobacter youngae	C2AXS6_9ENTR	468/440	44	65	0
Edwardsiella ictaluri	C5B9A8_EDWI9	481/441	44	65	0
Enterobacter sp.	A4W4Y3_ENT38	464/448	44	66	0
Escherichia coli SMS-3-5	B1LK91_ECOSM	463/440	44	65	0
Marinomonas sp.	A3Y6S5_9GAMM	482/460	44	64	1
Photobacterium profundum	Q1Z2L2_PHOPR	459/439	44	65	0
Photobacterium sp.	Q2BYF9_9GAMM	467/447	44	66	0
Photorhabdus luminescens	Q7N9R7_PHOLL	461/442	44	67	0
Pseudomonas syringae	Q4ZYM6_PSEU2	465/457	44	64	0
Salmonella choleraesuis	Q57I85_SALCH	463/440	44	66	0
Salmonella enterica	B5NDY7_SALET	463/440	44	66	0
Salmonella typhi	Q8XF42_SALTI	463/440	44	66	0
Shigella boydii	B2TTY4_SHIB3	463/440	44	65	0
Vibrio alginolyticus	Q1VAN3_VIBAL	462/453	44	66	0
Vibrio cholerae	C2C5Q8_VIBCH	478/456	44	66	0
Vibrio fischeri	Q5E8N5_VIBF1	463/439	44	66	0
Vibrio harveyi	A6AR91_VIBHA	463/448	44	67	0
Vibrio parahaemolyticus	Q87TB4_VIBPA	470/452	44	66	0

Vibrio sp.	A7K0Y9_9VIBR	462/453	44	66	0
Acinetobacter baumannii	B7I870_ACIB5	452/438	43	66	0
Burkholderia glumae	C5AKR9_BURGB	56/438	43	65	0
Burkholderia mallei	Q62II2_BURMA	462/446	43	66	0
Burkholderia pseudomallei	Q63VV9_BURPS	462/446	43	66	0
Campylobacter lari	B9KFN7_CAMLR	453/439	43	66	0
Klebsiella pneumoniae	B6D1N5_KLEPN	459/448	43	64	2
Photobacterium profundum	Q6LVQ0_PHOPR	459/439	43	65	0
Pseudoalteromonas atlantica	Q15TP7_PSEA6	486/450	43	65	1
Psychrobacter cryohalolentis	Q1Q9G3_PSYCK	468/453	43	66	0
Chromohalobacter salexigens	Q1QWM1_CHRSD	484/460	42	62	5
Klebsiella oxytoca	B5B0J7_KLEOX	460/447	42	62	1
Klebsiella pneumoniae	C8T9U9_KLEPR	465/452	42	63	2
Pantoea sp.	C8Q9J9_9ENTR	458/454	42	63	1
Vibrio shilonii	A6D2E9_9VIBR	460/438	42	65	0
Alteromonas macleodii	B4RSN4_ALTMD	517/445	41	64	0
Sagittula stellata	A3JYA4_9RHOB	470/464	40	62	0
Petrotoga mobilis	A9BIT1_PETMO	452/447	39	63	2
Actinobacillus succinogenes	A6VQK4_ACTSZ	435/437	37	57	3
Ralstonia eutropha	Q0K146_RALEH	443/439	37	57	3
Teredinibacter turnerae	C5BIN9_TERTT	470/434	37	58	0
Comamonas testosteroni	B7WUD5_COMTE	450/439	36	56	3
Cupriavidus taiwanensis	B3RAE8_CUPTR	443/439	36	57	3
Haloarcula marismortui	Q5V695_HALMA	468/442	36	58	3
Mannheimia haemolytica	A7JUF6_PASHA	439/437	36	56	3
Natrialba magadii	B9ZGA8_NATMA	470/450	36	55	1
Shewanella benthica	A9D3H0_9GAMM	465/436	36	59	3
uncultured haloarchaeon	A5YS00_9EURY	491/444	36	59	3
Acidaminococcus sp.	C0WAN0_9FIRM	439/447	35	53	3
Actinobacillus minor	C8KZ21_9PAST	430/437	35	57	3
Actinobacillus pleuropneumoniae	A3N185_ACTP2	430/438	35	57	3
Clostridium botulinum	C6DXR0_CLOBO	447/445	35	54	4
Clostridium butyricum	C4IFT3_CLOBU	440/437	35	58	3
Colwellia psychrerythraea	Q481N1_COLP3	449/440	35	57	3
Delftia acidovorans	A9BY97_DELAS	438/439	35	56	3
Fusobacterium varium	C6JK26_FUSVA	450/448	35	58	2
Haemophilus ducreyi	Q7VKR1_HAEDU	430/438	35	57	3
Laribacter hongkongensis	C1D7Z5_LARHH	435/438	35	56	3
Mannheimia succiniciproducens	Q65V28_MANSM	435/446	35	56	3
Marinobacter algicola	A6EZ23_9ALTE	468/431	35	54	4
Ralstonia metallidurans	Q1LGX9_RALME	445/438	35	56	3
Sebaldella termitidis	C4BV69_9FUSO	450/445	35	54	3
Thermanaerovibrio acidaminovorans	C4ESW5_9BACT	451/439	35	56	3
Verrucomicrobiae bacterium	B5JCP5_9BACT	425/427	35	57	3
Clostridium acetobutylicum	Q97KP5_CLOAB	435/437	34	57	3
Photobacterium profundum	Q6LQU1_PHOPR	493/436	34	56	3
Shewanella halifaxensis	B0TSQ8_SHEHH	468/436	34	58	3
Vibrio shilonii	A6CVS4_9VIBR	467/454	34	57	4
Alkaliphilus metalliredigens	A6TKW3_ALKMQ	451/445	33	53	4
Anaerococcus prevotii	C7RE35_ANAPD	449/454	33	53	5
Bacillus coagulans	C1PF47_BACCO	437/435	33	54	4
Bacillus licheniformis strain	Q65I87_BACLD	438/420	33	52	4
Bacillus subtilis	PBUX_BACSU	438/430	33	52	4
Bacteroides pectinophilus	B7AS73_9BACE	457/447	33	54	3
Clostridium botulinum	B2V3D4_CLOBA	454/441	33	56	4

Clostridium sp.	C1I4U8_9CLOT	454/439	33	55	3
Desulfotalea psychrophila	Q6AND3_DESPS	457/431	33	54	3
Eubacterium biforme	B7CE72_9FIRM	435/438	33	55	3
Eubacterium ventriosum	A5Z9F2_9FIRM	453/447	33	54	4
Exiguobacterium sibiricum	B1YHS2_EXIS2	435/417	33	52	4
Exiguobacterium sp.	C4L0T8_EXISA	434/437	33	52	5
Fibrobacter succinogenes	C5ULK6_FIBSU	434/440	33	53	3
Geobacillus sp.	B3K4T7_9BACI	453/451	33	50	4
Geobacillus thermodenitrificans	A4IN64_GEOTN	435/435	33	54	5
Jannaschia sp.	Q28P39_JANSC	478/444	33	51	6
Labrenzia aggregata	A0NUV6_9RHOB	478/440	33	53	4
Lactobacillus rhamnosus	C8UT52_LACRH	442/417	33	51	4
Marinomonas sp.	A3Y821_9GAMM	442/439	33	56	3
Octadecabacter antarcticus	B5J964_9RHOB	473/443	33	52	3
Oenococcus oeni	A0NJH6_OENOE	472/428	33	53	4
Parvularcula bermudensis	A3VU88_9PROT	442/438	33	54	5
Rhodobacteraceae bacterium	B9NQ91_9RHOB	475/446	33	52	4
Rhodobacterales bacterium	B6B3B5_9RHOB	442/434	33	52	4
Roseobacter sp.	A4ENL1_9RHOB	477/442	33	53	4
Roseobacter sp.	B7RKQ6_9RHOB	474/440	33	53	4
Ruegeria sp.	B7QQ92_9RHOB	475/458	33	52	4
Shuttleworthia satelles	C4GB19_9FIRM	443/451	33	53	3
Silicibacter pomeroyi	Q5LV28_SILPO	470/440	33	54	4
Silicibacter sp.	Q1GLM1_SILST	479/458	33	53	4
Sulfitobacter sp.	A3STN0_9RHOB	480/447	33	53	4
Treponema vincentii	C8PPS8_9SPIO	452/442	33	54	2
Vibrio shilonii	A6CZ45_9VIBR	469/443	33	54	3
Vibrio splendidus	A3UQN7_VIBSP	483/443	33	56	3

A blast-p search (Altschul et al., 2005) using XanQ as a query sequence (EcoGENE: EG13065) run on November 13, 2009, the pool of 840 best hits retrieved was checked for redundancy and, after omission of identical entries, we ended up with 188 homologs sharing a sequence identity of ≥ 33% with XanQ (see also Karena and Frillingos, 2009). These homologs are presented in the table with respect to their amino acid length, effective length used in the alignment, and their identity and similarity scores. Sequence alignments at the TM3 region were used for Table S3.

References used in Table S2

Altschul, S. F., Wootton, J. C., Gertz, E. M., Agarwala, R., Morgulis, A., Schäffer, A. A., and Yu, Y.-K. (2005). *FEBS J.* **272**, 5101-5109.

Karena, E., and Frillingos, S. (2009). *J. Biol. Chem.* **284**, 24257-24268.