

**Table S9C.** Transporters in the NA-SAGs (Co. Nitromaritima NA) pan-genome.

Function TC	ORF Name	Family ID	Transporter Family	Subfamily
3.A.1	NspB06_00001	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB06_00002	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.50	NspB06_00047	GUP	The Glycerol Uptake (GUP) Family	
2.A.50	NspB06_00057	GUP	The Glycerol Uptake (GUP) Family	
2.A.66	NspB06_00080	MOP	The Multidrug/Oligosaccharidyl-lipid/Polysaccharide (MOP) Flippase Superfamily	MVF
9.A.19	NspB06_00086	MgtE	The Mg <sup>2+</sup> Transporter-E (MgtE) Family	
3.A.1	NspB06_00116	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.7	NspB06_00120	DMT	The Drug/Metabolite Transporter (DMT) Superfamily	
2.A.64	NspB06_00149	Tat	The Twin Arginine Targeting (Tat) Family	
3.A.1	NspB06_00176	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB06_00177	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
2.A.63	NspB06_00212	CPA3	The Monovalent Cation (K <sup>+</sup> or Na <sup>+</sup> ):Proton Antiporter-3 (CPA3) Family	MnhA
2.A.62	NspB06_00220	NhaD	The NhaD Na <sup>+</sup> :H <sup>+</sup> Antiporter (NhaD) Family	
2.A.36	NspB06_00221	CPA1	The Monovalent Cation:Proton Antiporter-1 (CPA1) Family	
2.A.7	NspB06_00233	DMT	The Drug/Metabolite Transporter (DMT) Superfamily	
2.A.19	NspB06_00259	CaCA	The Ca <sup>2+</sup> :Cation Antiporter (CaCA) Family	
2.A.41	NspB06_00264	CNT	The Concentrative Nucleoside Transporter (CNT) Family	
1.A.30	NspB06_00270	Mot/Exb	The H <sup>+</sup> or Na <sup>+</sup> -translocating Bacterial Flagellar Motor 1ExbD Outer Membrane Transport Energizer (Mo	
1.B.6	NspB06_00272	OOP	The OmpA-OmpF Porin (OOP) Family	
2.A.1	NspB06_00273	MFS	The Major Facilitator Superfamily (MFS)	
2.A.64	NspB06_00284	Tat	The Twin Arginine Targeting (Tat) Family	
2.A.63	NspB06_00288	CPA3	The Monovalent Cation (K <sup>+</sup> or Na <sup>+</sup> ):Proton Antiporter-3 (CPA3) Family	MnhA
2.A.21	NspB06_00308	SSS	The Solute:Sodium Symporter (SSS) Family	
2.A.66	NspB06_00312	MOP	The Multidrug/Oligosaccharidyl-lipid/Polysaccharide (MOP) Flippase Superfamily	PST
3.A.1	NspB06_00374	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.50	NspB06_00454	GUP	The Glycerol Uptake (GUP) Family	
3.A.7	NspB06_00459	IVSP	The Type IV (Conjugal DNA-Protein Transfer or VirB) Secretory Pathway (IVSP) Family	
3.A.1	NspB06_00468	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.1	NspB06_00483	MFS	The Major Facilitator Superfamily (MFS)	
3.A.1	NspB06_00486	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB06_00487	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB06_00488	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB06_00489	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB06_00503	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB06_00504	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB06_00505	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.6	NspB06_00572	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	SecDF
2.A.6	NspB06_00591	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	HAE3
2.A.7	NspB06_00675	DMT	The Drug/Metabolite Transporter (DMT) Superfamily	
3.A.1	NspB06_00676	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.43	NspB06_00683	LCT	The Lysosomal Cystine Transporter (LCT) Family	
2.A.1	NspB06_00686	MFS	The Major Facilitator Superfamily (MFS)	
3.A.2	NspB06_00755	F-ATPase	The H <sup>+</sup> or Na <sup>+</sup> -translocating F-type, V-type and A-type ATPase (F-ATPase) Superfamily	
3.A.2	NspB06_00756	F-ATPase	The H <sup>+</sup> or Na <sup>+</sup> -translocating F-type, V-type and A-type ATPase (F-ATPase) Superfamily	
3.A.2	NspB06_00757	F-ATPase	The H <sup>+</sup> or Na <sup>+</sup> -translocating F-type, V-type and A-type ATPase (F-ATPase) Superfamily	
3.A.2	NspB06_00758	F-ATPase	The H <sup>+</sup> or Na <sup>+</sup> -translocating F-type, V-type and A-type ATPase (F-ATPase) Superfamily	
2.A.5	NspB06_00764	ZIP	The Zinc (Zn <sup>2+</sup> )-Iron (Fe <sup>2+</sup> ) Permease (ZIP) Family	
3.A.1	NspB06_00765	ABC	The ATP-binding Cassette (ABC) Superfamily	ABC+ membrane
3.A.1	NspB06_00766	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.6	NspB06_00819	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	HAE1
2.A.6	NspB06_00820	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	
2.A.1	NspB06_00834	MFS	The Major Facilitator Superfamily (MFS)	
3.A.1	NspB06_00854	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
2.A.37	NspB06_00874	CPA2	The Monovalent Cation:Proton Antiporter-2 (CPA2) Family	
9.A.4	NspB06_00884	YggT	The YggT or Fanciful K <sup>+</sup> Uptake-B (FkuB; YggT) Family	
2.A.1	NspB06_00893	MFS	The Major Facilitator Superfamily (MFS)	
2.A.28	NspB06_00905	BASS	The Bile Acid:Na <sup>+</sup> Symporter (BASS) Family	
3.A.1	NspB06_00912	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.21	NspB06_00928	SSS	The Solute:Sodium Symporter (SSS) Family	
3.A.1	NspB06_00967	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.64	NspB06_00968	Tat	The Twin Arginine Targeting (Tat) Family	
3.A.1	NspB06_01022	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB06_01023	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.58	NspB06_01100	PNaS	The Phosphate:Na <sup>+</sup> Symporter (PNaS) Family	
3.A.1	NspB06_01102	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.9	NspB06_01190	Oxa1	The Cytochrome Oxidase Biogenesis (Oxa1) Family	
3.A.7	NspB06_01197	IVSP	The Type IV (Conjugal DNA-Protein Transfer or VirB) Secretory Pathway (IVSP) Family	
3.A.2	NspB06_01230	F-ATPase	The H <sup>+</sup> or Na <sup>+</sup> -translocating F-type, V-type and A-type ATPase (F-ATPase) Superfamily	
3.A.2	NspB06_01231	F-ATPase	The H <sup>+</sup> or Na <sup>+</sup> -translocating F-type, V-type and A-type ATPase (F-ATPase) Superfamily	
3.A.2	NspB06_01232	F-ATPase	The H <sup>+</sup> or Na <sup>+</sup> -translocating F-type, V-type and A-type ATPase (F-ATPase) Superfamily	
3.A.2	NspB06_01233	F-ATPase	The H <sup>+</sup> or Na <sup>+</sup> -translocating F-type, V-type and A-type ATPase (F-ATPase) Superfamily	
1.A.46	NspB06_01257	Bestrophin	The Anion Channel-forming Bestrophin (Bestrophin) Family	
2.A.64	NspB06_01295	Tat	The Twin Arginine Targeting (Tat) Family	
2.A.7	NspB06_01299	DMT	The Drug/Metabolite Transporter (DMT) Superfamily	
3.A.1	NspB06_01353	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB06_01367	ABC	The ATP-binding Cassette (ABC) Superfamily	binding protein
3.A.1	NspB06_01368	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB06_01369	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB06_01370	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB06_01373	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.6	NspB06_01404	IIISP	The Type III (Virulence-related) Secretory Pathway (IIISP) Family	
3.A.6	NspB06_01405	IIISP	The Type III (Virulence-related) Secretory Pathway (IIISP) Family	
3.A.6	NspB06_01406	IIISP	The Type III (Virulence-related) Secretory Pathway (IIISP) Family	
3.A.6	NspB06_01407	IIISP	The Type III (Virulence-related) Secretory Pathway (IIISP) Family	
3.A.1	NspB06_01454	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB06_01455	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB06_01479	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB06_01480	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB06_01482	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.15	NspB06_01510	MTB	The Outer Membrane Protein Secreting Main Terminal Branch (MTB)	
2.A.49	NspB06_01589	CIC	The Chloride Carrier/Channel (CIC) Family	
2.A.47	NspB06_01620	DASS	The Divalent Anion:Na <sup>+</sup> Symporter (DASS) Family	
3.A.1	NspB06_01637	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.25	NspB06_01653	AGCS	The Alanine or Glycine:Cation Symporter (AGCS) Family	
3.A.2	NspB06_01663	F-ATPase	The H <sup>+</sup> or Na <sup>+</sup> -translocating F-type, V-type and A-type ATPase (F-ATPase) Superfamily	
3.A.2	NspB06_01664	F-ATPase	The H <sup>+</sup> or Na <sup>+</sup> -translocating F-type, V-type and A-type ATPase (F-ATPase) Superfamily	
2.A.66	NspB06_01754	MOP	The Multidrug/Oligosaccharidyl-lipid/Polysaccharide (MOP) Flippase Superfamily	
2.A.25	NspB06_01785	AGCS	The Alanine or Glycine:Cation Symporter (AGCS) Family	
2.A.44	NspB06_01948	FNT	The Formate-Nitrite Transporter (FNT) Family	
1.A.23	NspB06_02032	MscS	The Small Conductance Mechanosensitive Ion Channel (MscS) Family	
3.A.6	NspB18_00054	IIISP	The Type III (Virulence-related) Secretory Pathway (IIISP) Family	
2.A.47	NspB18_00077	DASS	The Divalent Anion:Na <sup>+</sup> Symporter (DASS) Family	
3.A.1	NspB18_00157	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB18_00158	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane

3.A.1	NspB18_00159	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.6	NspB18_00160	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	
3.A.1	NspB18_00193	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB18_00199	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.40	NspB18_00230	NCS2	The Nucleobase:Cation Symporter-2 (NCS2) Family	
1.A.30	NspB18_00266	Mot/Exb	The H <sup>+</sup> - or Na <sup>+</sup> -translocating Bacterial Flagellar Motor 1ExbBD Outer Membrane Transport Energizer (Mo	
9.A.10	NspB18_00303	ILT	The Iron/Lead Transporter (ILT) Superfamily	
3.A.1	NspB18_00312	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB18_00313	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB18_00314	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB18_00402	ABC	The ATP-binding Cassette (ABC) Superfamily	???????
3.A.1	NspB18_00403	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
4.A	NspB18_00406	SSPTS	Sugar Specific PTS	EnzymellA
4.A	NspB18_00407	GPTS	General PTS	Enzymel
2.A.20	NspB18_00690	PIT	The Inorganic Phosphate Transporter (PIT) Family	
3.A.7	NspB18_00705	IVSP	The Type IV (Conjugal DNA-Protein Transfer or VirB) Secretory Pathway (IVSP) Family	
1.A.11	NspB18_00716	Amt	The Ammonia Transporter Channel (Amt) Family	
3.A.1	NspB18_00756	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB18_00757	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.15	NspB18_00774	MTB	The Outer Membrane Protein Secreting Main Terminal Branch (MTB)	
3.A.15	NspB18_00775	MTB	The Outer Membrane Protein Secreting Main Terminal Branch (MTB)	
3.A.15	NspB18_00776	MTB	The Outer Membrane Protein Secreting Main Terminal Branch (MTB)	
3.A.3	NspB18_00814	P-ATPase	The P-type ATPase (P-ATPase) Superfamily	
9.A.40	NspB18_00860	HCC	The HlyC/CorC (HCC) Family	
9.A.40	NspB18_00861	HCC	The HlyC/CorC (HCC) Family	
3.A.1	NspB18_00934	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB18_00935	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB18_01006	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB18_01007	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB18_01120	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB18_01121	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.2	NspB18_01139	F-ATPase	The H <sup>+</sup> - or Na <sup>+</sup> -translocating F-type, V-type and A-type ATPase (F-ATPase) Superfamily	
3.A.1	NspB18_01245	ABC	The ATP-binding Cassette (ABC) Superfamily	ABC+ membrane
2.A.21	NspB18_01273	SSS	The Solute:Sodium Symporter (SSS) Family	
1.A.34	NspB18_01298	EVE1-C	The Envelope Virus E1 Channel (EVE1-C) Family	
2.A.86	NspB18_01343	AI-2E	The Autoinducer-2 Exporter (AI-2E) Family (Formerly the PerM Family, TC #9.B.22)	
2.A.4	NspB18_01354	CDF	The Cation Diffusion Facilitator (CDF) Family	
2.A.38	NspB18_01382	Trk	The K <sup>+</sup> Transporter (Trk) Family	
2.A.63	NspB18_01391	CPA3	The Monovalent Cation (K <sup>+</sup> or Na <sup>+</sup> ):Proton Antiporter-3 (CPA3) Family	MnhE
2.A.63	NspB18_01392	CPA3	The Monovalent Cation (K <sup>+</sup> or Na <sup>+</sup> ):Proton Antiporter-3 (CPA3) Family	MnhF
2.A.63	NspB18_01393	CPA3	The Monovalent Cation (K <sup>+</sup> or Na <sup>+</sup> ):Proton Antiporter-3 (CPA3) Family	MnhG
2.A.63	NspB18_01394	CPA3	The Monovalent Cation (K <sup>+</sup> or Na <sup>+</sup> ):Proton Antiporter-3 (CPA3) Family	MnhB
2.A.63	NspB18_01395	CPA3	The Monovalent Cation (K <sup>+</sup> or Na <sup>+</sup> ):Proton Antiporter-3 (CPA3) Family	MnhB
2.A.63	NspB18_01396	CPA3	The Monovalent Cation (K <sup>+</sup> or Na <sup>+</sup> ):Proton Antiporter-3 (CPA3) Family	MnhC
2.A.63	NspB18_01397	CPA3	The Monovalent Cation (K <sup>+</sup> or Na <sup>+</sup> ):Proton Antiporter-3 (CPA3) Family	MnhD
2.A.63	NspB18_01398	CPA3	The Monovalent Cation (K <sup>+</sup> or Na <sup>+</sup> ):Proton Antiporter-3 (CPA3) Family	MnhA
2.A.50	NspB18_01444	GUP	The Glycerol Uptake (GUP) Family	
2.A.47	NspB18_01471	DASS	The Divalent Anion:Na <sup>+</sup> Symporter (DASS) Family	
3.A.1	NspB18_01725	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB18_01753	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB18_01754	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB18_01755	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.7	NspB18_01794	DMT	The Drug/Metabolite Transporter (DMT) Superfamily	
3.A.1	NspB18_01874	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.6	NspB18_01908	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	HAE3
3.A.1	NspB18_01909	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB18_01919	ABC	The ATP-binding Cassette (ABC) Superfamily	binding protein
3.A.1	NspB18_01924	ABC	The ATP-binding Cassette (ABC) Superfamily	ABC+ membrane
2.A.23	NspB18_02018	DAACS	The Dicarboxylate/Amino Acid:Cation (Na <sup>+</sup> or H <sup>+</sup> ) Symporter (DAACS) Family	
3.A.1	NspB18_02057	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB18_02058	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.4	NspB18_02060	CDF	The Cation Diffusion Facilitator (CDF) Family	
9.A.19	NspB18_02063	MgtE	The Mg <sup>2+</sup> Transporter-E (MgtE) Family	
1.A.23	NspB18_02064	MscS	The Small Conductance Mechanosensitive Ion Channel (MscS) Family	
2.A.64	NspB18_02075	Tat	The Twin Arginine Targeting (Tat) Family	
2.A.6	NspB18_02077	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	HAE3
2.A.1	NspB18_02217	MFS	The Major Facilitator Superfamily (MFS)	
2.A.50	NspB18_02375	GUP	The Glycerol Uptake (GUP) Family	
2.A.66	NspB18_02383	MOP	The Multidrug/Oligosaccharidyl-lipid/Polysaccharide (MOP) Flippase Superfamily	PST
3.A.1	NspB18_02395	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB18_02420	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
1.A.34	NspB18_02494	EVE1-C	The Envelope Virus E1 Channel (EVE1-C) Family	
3.A.15	NspB18_02575	MTB	The Outer Membrane Protein Secreting Main Terminal Branch (MTB)	
3.A.1	NspB18_02601	ABC	The ATP-binding Cassette (ABC) Superfamily	ABC+ membrane
2.A.1	NspB18_02626	MFS	The Major Facilitator Superfamily (MFS)	
1.A.30	NspB18_02670	Mot/Exb	The H <sup>+</sup> - or Na <sup>+</sup> -translocating Bacterial Flagellar Motor 1ExbBD Outer Membrane Transport Energizer (Mo	
3.A.1	NspB18_02698	ABC	The ATP-binding Cassette (ABC) Superfamily	ABC
3.A.1	NspB18_02756	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB18_02817	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB18_02824	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspB18_02827	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspB18_02861	ABC	The ATP-binding Cassette (ABC) Superfamily	ABC