

**Table S9B.** Transporters in the RS-SAGs (Co. Nitromaritima RS) pan-genome.

Function TC	ORF Name	Family ID	Transporter Family	Subfamily
2.A.36	NspA02_00075	CPA1	The Monovalent Cation:Proton Antiporter-1 (CPA1) Family	
2.A.43	NspA02_00150	LCT	The Lysosomal Cystine Transporter (LCT) Family	
3.A.1	NspA02_00158	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspA02_00159	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.21	NspA02_00197	SSS	The Solute:Sodium Symporter (SSS) Family	
3.A.1	NspA02_00394	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspA02_00395	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspA02_00396	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
2.A.6	NspA02_00492	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	HAE3
2.A.66	NspA02_00634	MOP	The Multidrug/Oligosaccharidyl-lipid/Polysaccharide (MOP) Flippase Superfamily	PST
3.A.1	NspA02_00670	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
1.B.6	NspA02_01127	OOP	The OmpA-OmpF Porin (OOP) Family	
2.A.6	NspA02_01136	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	HME
1.B.17	NspA02_01142	OMF	The Outer Membrane Factor (OMF) Family	
3.A.1	NspA02_01143	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspA02_01144	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.6	NspA02_01267	IIISP	The Type III (Virulence-related) Secretory Pathway (IIISP) Family	
3.A.1	NspA02_01293	ABC	The ATP-binding Cassette (ABC) Superfamily	binding protein
3.A.1	NspA02_01294	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspA02_01296	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
2.A.21	NspA02_01376	SSS	The Solute:Sodium Symporter (SSS) Family	
3.A.1	NspA02_01440	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
2.A.62	NspA02_01491	NhaD	The NhaD Na <sup>+</sup> :H <sup>+</sup> Antiporter (NhaD) Family	
2.A.66	NspC22_00018	MOP	The Multidrug/Oligosaccharidyl-lipid/Polysaccharide (MOP) Flippase Superfamily	PST
3.A.1	NspC22_00052	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_00053	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_00054	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
2.A.66	NspC22_00066	MOP	The Multidrug/Oligosaccharidyl-lipid/Polysaccharide (MOP) Flippase Superfamily	MVF
9.A.10	NspC22_00071	ILT	The Iron/Lead Transporter (ILT) Superfamily	
9.A.19	NspC22_00081	MgtE	The Mg <sup>2+</sup> Transporter-E (MgtE) Family	
2.A.19	NspC22_00131	CaCa	The Ca <sup>2+</sup> :Cation Antiporter (CaCa) Family	
1.A.30	NspC22_00142	Mot/Exb	The H <sup>+</sup> - or Na <sup>+</sup> -translocating Bacterial Flagellar Motor 1ExbBD Outer Membrane Transport Energizer (Mo	
1.B.6	NspC22_00145	OOP	The OmpA-OmpF Porin (OOP) Family	
2.A.1	NspC22_00146	MFS	The Major Facilitator Superfamily (MFS)	
2.A.64	NspC22_00155	Tat	The Twin Arginine Targeting (Tat) Family	
3.A.1	NspC22_00194	ABC	The ATP-binding Cassette (ABC) Superfamily	ABC+ membrane
3.A.1	NspC22_00247	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_00248	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_00249	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.21	NspC22_00255	SSS	The Solute:Sodium Symporter (SSS) Family	
3.A.1	NspC22_00280	ABC	The ATP-binding Cassette (ABC) Superfamily	binding protein
1.A.34	NspC22_00289	EVE1-C	The Envelope Virus E1 Channel (EVE1-C) Family	
2.A.86	NspC22_00327	AI-2E	The Autoinducer-2 Exporter (AI-2E) Family (Formerly the PerM Family, TC #9.B.22)	
2.A.4	NspC22_00338	CDF	The Cation Diffusion Facilitator (CDF) Family	
1.A.30	NspC22_00347	Mot/Exb	The H <sup>+</sup> - or Na <sup>+</sup> -translocating Bacterial Flagellar Motor 1ExbBD Outer Membrane Transport Energizer (Mo	
1.A.30	NspC22_00348	Mot/Exb	The H <sup>+</sup> - or Na <sup>+</sup> -translocating Bacterial Flagellar Motor 1ExbBD Outer Membrane Transport Energizer (Mo	
3.A.1	NspC22_00351	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_00362	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.21	NspC22_00371	SSS	The Solute:Sodium Symporter (SSS) Family	
1.A.30	NspC22_00373	Mot/Exb	The H <sup>+</sup> - or Na <sup>+</sup> -translocating Bacterial Flagellar Motor 1ExbBD Outer Membrane Transport Energizer (Mo	
2.A.25	NspC22_00387	AGCS	The Alanine or Glycine:Cation Symporter (AGCS) Family	
2.A.44	NspC22_00397	FNT	The Formate-Nitrite Transporter (FNT) Family	
3.A.1	NspC22_00402	ABC	The ATP-binding Cassette (ABC) Superfamily	binding protein
3.A.1	NspC22_00403	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_00404	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.52	NspC22_00406	NiCoT	The Ni <sup>2+</sup> -Co <sup>2+</sup> Transporter (NiCoT) Family	
9.A.10	NspC22_00429	ILT	The Iron/Lead Transporter (ILT) Superfamily	
2.A.4	NspC22_00433	CDF	The Cation Diffusion Facilitator (CDF) Family	
2.A.21	NspC22_00439	SSS	The Solute:Sodium Symporter (SSS) Family	
2.A.20	NspC22_00443	PIT	The Inorganic Phosphate Transporter (PIT) Family	
2.A.21	NspC22_00470	SSS	The Solute:Sodium Symporter (SSS) Family	
2.A.21	NspC22_00471	SSS	The Solute:Sodium Symporter (SSS) Family	
2.A.21	NspC22_00479	SSS	The Solute:Sodium Symporter (SSS) Family	
2.A.7	NspC22_00481	DMT	The Drug/Metabolite Transporter (DMT) Superfamily	
3.A.3	NspC22_00519	P-ATPase	The P-type ATPase (P-ATPase) Superfamily	
2.A.9	NspC22_00524	Oxa1	The Cytochrome Oxidase Biogenesis (Oxa1) Family	
2.A.36	NspC22_00576	CPA1	The Monovalent Cation:Proton Antiporter-1 (CPA1) Family	
3.A.1	NspC22_00582	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_00583	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_00584	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
1.B.6	NspC22_00636	OOP	The OmpA-OmpF Porin (OOP) Family	
1.A.30	NspC22_00637	Mot/Exb	The H <sup>+</sup> - or Na <sup>+</sup> -translocating Bacterial Flagellar Motor 1ExbBD Outer Membrane Transport Energizer (Mo	
3.A.1	NspC22_00639	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_00640	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.21	NspC22_00653	SSS	The Solute:Sodium Symporter (SSS) Family	
3.A.1	NspC22_00657	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_00658	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_00659	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
2.A.47	NspC22_00691	DASS	The Divalent Anion:Na <sup>+</sup> Symporter (DASS) Family	
3.A.1	NspC22_00712	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_00713	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_00714	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.6	NspC22_00715	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	
9.A.4	NspC22_00739	YggT	The YggT or Fancil K <sup>+</sup> Uptake-B (FkuB; YggT) Family	
3.A.15	NspC22_00773	MTB	The Outer Membrane Protein Secreting Main Terminal Branch (MTB)	
2.A.21	NspC22_00774	SSS	The Solute:Sodium Symporter (SSS) Family	
2.A.21	NspC22_00782	SSS	The Solute:Sodium Symporter (SSS) Family	
3.A.15	NspC22_00784	MTB	The Outer Membrane Protein Secreting Main Terminal Branch (MTB)	
2.A.56	NspC22_00825	TRAP-T	The Tripartite ATP-independent Periplasmic Transporter (TRAP-T) Family	
2.A.56	NspC22_00858	TRAP-T	The Tripartite ATP-independent Periplasmic Transporter (TRAP-T) Family	
2.A.56	NspC22_00859	TRAP-T	The Tripartite ATP-independent Periplasmic Transporter (TRAP-T) Family	
2.A.22	NspC22_00874	NSS	The Neurotransmitter:Sodium Symporter (NSS) Family	
2.A.21	NspC22_00891	SSS	The Solute:Sodium Symporter (SSS) Family	
3.A.1	NspC22_00909	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_00910	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.38	NspC22_00941	Trk	The K <sup>+</sup> Transporter (Trk) Family	
2.A.6	NspC22_00978	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	HME
3.A.1	NspC22_01023	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_01024	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.64	NspC22_01033	Tat	The Twin Arginine Targeting (Tat) Family	
1.A.34	NspC22_01044	EVE1-C	The Envelope Virus E1 Channel (EVE1-C) Family	

4.A	NspC22_01075	GPTS	General PTS	Enzymel
4.A	NspC22_01076	SSPTS	Sugar Specific PTS	EnzymelIA
3.A.1	NspC22_01079	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_01080	ABC	The ATP-binding Cassette (ABC) Superfamily	???????
3.A.15	NspC22_01097	MTB	The Outer Membrane Protein Secreting Main Terminal Branch (MTB)	
3.A.1	NspC22_01102	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_01116	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_01117	ABC	The ATP-binding Cassette (ABC) Superfamily	binding protein
3.A.1	NspC22_01119	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
1.A.11	NspC22_01140	Amt	The Ammonia Transporter Channel (Amt) Family	
2.A.6	NspC22_01164	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	HME
2.A.6	NspC22_01176	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	HME
2.A.4	NspC22_01177	CDF	The Cation Diffusion Facilitator (CDF) Family	
3.A.2	NspC22_01193	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	NspC22_01194	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	NspC22_01195	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	NspC22_01196	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	NspC22_01197	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	NspC22_01198	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	NspC22_01199	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	NspC22_01200	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	NspC22_01243	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.1	NspC22_01272	MFS	The Major Facilitator Superfamily (MFS)	
3.A.1	NspC22_01293	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
9.A.19	NspC22_01306	MgtE	The Mg <sup>2+</sup> Transporter-E (MgtE) Family	
2.A.21	NspC22_01329	SSS	The Solute-Sodium Symporter (SSS) Family	
2.A.1	NspC22_01331	MFS	The Major Facilitator Superfamily (MFS)	
9.A.40	NspC22_01362	HCC	The HlyC/CorC (HCC) Family	
9.A.40	NspC22_01363	HCC	The HlyC/CorC (HCC) Family	
3.A.1	NspC22_01416	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_01417	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.64	NspC22_01449	Tat	The Twin Arginine Targeting (Tat) Family	
2.A.6	NspC22_01456	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	HME
3.A.1	NspC22_01458	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_01460	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.6	NspC22_01461	RND	The Resistance-Nodulation-Cell Division (RND) Superfamily	HAE3
3.A.1	NspC22_01552	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_01581	ABC	The ATP-binding Cassette (ABC) Superfamily	binding protein
3.A.1	NspC22_01582	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_01583	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_01584	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_01612	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_01613	ABC	The ATP-binding Cassette (ABC) Superfamily	membrane
3.A.1	NspC22_01614	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
3.A.1	NspC22_01617	ABC	The ATP-binding Cassette (ABC) Superfamily	binding
2.A.64	NspC22_01721	Tat	The Twin Arginine Targeting (Tat) Family	
2.A.38	NspC22_01734	Trk	The K <sup>+</sup> Transporter (Trk) Family	
1.A.1	NspC22_01735	VIC	The Voltage-gated Ion Channel (VIC) Superfamily	