

Table S1. Alignment of proteins in group IA around Cys448 in LodA

Locus tag	Organism	Sequence of residues 430-463 in LodA
		xhxxxDxxxhGNCVgxPxCPGIEVTWSxxlxxhy
Marme_2662 LodA	LodA <i>Marinomonas mediterranea</i> MMB-1	PVSDMDTASIGNCVGLPMCPGIEVTWSLQNPVIY
Mmwy11_3721	<i>Marinomonas</i> sp. MMYL1	PVNEMDAASIGNCVGLPMCPGIEVTWSLQNSKLY
M320_pool_00037300	<i>Marinomonas</i> sp GOBB3-320	YVNEMDAASIGNCVGLPMCPGIEVTWSLQNSKLY
PTD2_20217	<i>Pseudoalteromonas tunicata</i> D2	AVHPLDKASIGNCVGLPMCPGIEVTWSLQNPPLY
G509DRAFT_1169	<i>Flavobacterium subsaxonicum</i> DSM 21790	PVSLDDTASVGNVGLPMCPGIEVTWSMQNPAVY
PCIT_22609	<i>Pseudoalteromonas citrea</i> NCIMB 1889	PVDPLDQGSVGNVGLPMCPGIEVTWSLQNPVY
Rhein_1334	<i>Rheinheimera</i> sp. A13L	PVNPDLQGSVGNVGLPMCPGIEVTWSMQNPAVY
H527DRAFT_03370	<i>Aquimarina muelleri</i> DSM 19832	AISEIDMASVGNVGLPMCPGIEVTWSLQENIY
PL2TA16_00557	<i>Pseudoalteromonas luteoviolacea</i> 2ta16	GVFYADQSSVGNVGLPMCPGIEVTWSMQNPAVY
PflaDRAFT_00041100	<i>Pseudoalteromonas flavipulchra</i> 2ta6	GVFYADQGSVGNVGLPMCPGIEVTWSLQNPVY
UY7DRAFT_03653	<i>Pseudoalteromonas flavipulchra</i> JG1	GVFYADQGSVGNVGLPMCPGIEVTWSLQNPVY
PPIS_19511	<i>Pseudoalteromonas piscicida</i> JCM 20779	GVFYADQGSVGNVGLPMCPGIEVTWSLQNPVY
G366DRAFT_02721	<i>Pseudoalteromonas piscicida</i> ATCC 15057	GVFYADQGSVGNVGLPMCPGIEVTWSLQNPVY
Gei7105DRAFT_0285	<i>Geitlerinema</i> sp. PCC 7105	GVDDRDRASVGNVGLPQCPGIEVTWTTQNPVY
Nha1_1391	<i>Nitrosococcus halophilus</i> Nc4	PLCSATSAAMGNVGLPMCPGIEVTWSMQNPAIY
F460DRAFT_04769	<i>Duganella zoogloeoides</i> ATCC 25935	GIAALDRAAIGNCVGEPMPGIEVTWSVRNPVIY
2520384729*	<i>Nitrolancetus hollandicus</i> Lb	GIHPLDRVDIGNCVGDPMPGIEVTWSVRNPAIY
G559DRAFT_00896	<i>Pseudomonas resinovorans</i> DSM 21078	GVTALDRASVGNVGGPLCPGIEVTWSLYSPELY
CC1582_00022990	<i>Pseudomonas viridaflava</i> CC1582	NVTDLDRASVGNVGGPFCPGIEVTWSLYSKALY
TA043_00024900	<i>Pseudomonas viridaflava</i> TA043	NVTDLDRASVGNVGGPFCPGIEVTWSLYSKALY

Blue, consensus 100%; Red, >90%; H, hydrophobic residue; 1, N or S
 *, IMG gene identification

Table S2. Alignment of proteins in group IA around Lys530 in LodA

Locus tag	Organism	Sequence of residues 494-590 in LodA	
		xGC1PGDLTKRMAxPWQADFFxC32Qx2NFxxcPxhNK	PxxPxYYxYWWPPQSPWDV4
Marme_2662	LodA <i>Marinomonas mediterranea</i> MMB-1	TGCEPGDLTKRMACPWQADFFNCTVQVNFSEPSVNK (x) 40	PLPPAYYSYWWPPQSPWDVL
Mmwy11_3721	<i>Marinomonas</i> sp. MWYL1	VGCEPGDLTKRMACPWQADFFNCTVQVNFSEPKVNK (x) 40	PLPPAYYSYWWPPQSPWDVL
M320_pool_00037300	<i>Marinomonas</i> sp GOBB3-320	GGCEPGDLTKRMACPWQADFFNCTVQVNFSEPKVNK (x) 40	PLPPAYYSYWWPPQSPWDVL
PTD2_20217	<i>Pseudoalteromonas tunicata</i> D2	GGCQPGDLTKRMACPWQADFFQCTVQPVNFTEPLINK (x) 74	PITPTYYSYWWPPQSPWDVL
G509DRAFT_1169	<i>Flavobacterium subsaxonicum</i> DSM 21790	GGCEPGDLTKRMACPWQADFFECTIQTNINFSDPVANK (x) 08	PLPPTYYSYWWPPQSPWDVI
PCIT_22609	<i>Pseudoalteromonas citrea</i> NCIMB 1889	GGCEPGDLTKRMACPWQADFFQCTIQNINFTNPAKKNK (x) 04	PLPPTYYSYWWPPQSPWDVL
Rhein_1334	<i>Rheinheimera</i> sp. A13L	GGCQPGDLTKRMACPWQADFFQCTVQPVNFTEVPEVNK (x) 04	PLPPTYAYWWPPQSPWDVL
H527DRAFT_03370	<i>Aquimarina muelleri</i> DSM 19832	GGCEPGDLTKRMACPWQADFFQCTIQYINFSDEINK (x) 34	PLPPSYTYWWPPQSPWDVL
PL2TA16_00557	<i>Pseudoalteromonas luteoviolacea</i> 2ta16	GGCQPGDLTKRMACPWQADFFNCTIQNVNFTDPTVNK (x) 12	PLAPTYYSYWWPPQSPWDVL
PflaDRAFT_00041100	<i>Pseudoalteromonas flavipulchra</i> 2ta6	GGCQPGDLTKRMACPWQADFFNCTIQNVNFTTEPTVNK (x) 12	PAAPTYYSYWWPPQSPWDVL
UY7DRAFT_03653	<i>Pseudoalteromonas flavipulchra</i> JG1	GGCQPGDLTKRMACPWQADFFNCTIQNVNFTTEPTVNK (x) 12	PAAPTYYSYWWPPQSPWDVL
PPIS_19511	<i>Pseudoalteromonas piscicida</i> JCM 20779	GGCQPGDLTKRMACPWQADFFNCTIQNVNFTTEPTVNK (x) 12	PAAPTYYSYWWPPQSPWDVL
G366DRAFT_02721	<i>Pseudoalteromonas piscicida</i> ATCC 15057	GGCQPGDLTKRMACPWQADFFNCTIQNVNFTTEPTVNK (x) 12	PAAPTYYSYWWPPQSPWDVL
Gei7105DRAFT_0285	<i>Geitlerinema</i> sp. PCC 7105	GGCEPGDLTKRMAIPWQADFFNCSIQFVNFTDPNVNK (x) 09	PKPPTYYSYWWPPQAPWNVL
Nhal_1391	<i>Nitrosococcus halophilus</i> Nc4	GGCEPGDLTKRMAIPWQADFFNCTIQYVNFTDPDINK (x) 04	PLPPSYAYWWPPQAPWDVL
F460DRAFT_04769	<i>Duganella zoogloeoides</i> ATCC 25935	SGCEPGDLTKRMAIPWQADFYDCSVQMINFDNPDLVK (x) 06	PVPPTYAYWWPPQSPWNVI
2520384729*	<i>Nitrolanceetus hollandicus</i> Lb	GGCEPGDLTKRMAIPWQADFFACSVQYINFTDPNVNK (x) 04	PKPPTFFAYWWPPQSPMHVI
G559DRAFT_00896	<i>Pseudomonas resinovorans</i> DSM 21078	QGCEPGDLTKRMAIPWQADFFQCTVQYVNFTDPEVNK (x) 04	PKAPSYAYWWPPQSPWNVL
CC1582_00022990	<i>Pseudomonas viridaflava</i> CC1582	QGCEPGDLTKRMATPWQSDFFQCTVQYINFSDSANK (x) 04	PKPPTYAYWWPPQSPWNVI
TA043_00024900	<i>Pseudomonas viridaflava</i> TA043	QGCEPGDLTKRMATPWQSDFFQCTVQYINFSNDANK (x) 04	PKPPTYAYWWPPQSPWNVI

Blue, consensus 100%; Red, >90%; h: hydrophobic residue; 1, E or Q; 2, I or V; 3, S or T; 4, I or L

*, IMG gene identification

Table S3. Alignment of proteins in group IA around Tyr211 in LodA

Locus tag	Organism	Sequence of residues 182-230 in LodA
		LGxhxTDxxGR ^{Lh} VhGGxGxAGGxxxhx123GxxxWxDDx4DGxVxCxh
Marme_2662	LodA <i>Marinomonas mediterranea</i> MMB-1	LGLRLTDSQGRLLIVLGGYGFAGGNTDLSGYGGGDDWYDDISDGSVTCVV
Mmwy11_3721	<i>Marinomonas</i> sp. MWYL1	LGTLLTDDKGRLLIVLGGYGRAGGNTDLEGYGGGDEWFDDISDGPVTCVV
M320_pool_00037300	<i>Marinomonas</i> sp GOBB3-320	LGLRLTDNKGRLLIVLGGYGRAGGNTDLEGYGGGDEWFDDISDGPVTCVV
PTD2_20217	<i>Pseudoalteromonas tunicata</i> D2	LGLTKTDNKGRLLIVFGGYGHAGGDEALTSYGGSDTWHDDIADGPPVYCEV
G509DRAFT_1169	<i>Flavobacterium subsaxonicum</i> DSM 21790	LGNLLTDASGRLLVVLGGYGNAGGNEPLTSYGGSDTWHDDISDGPVYCTV
PCIT_22609	<i>Pseudoalteromonas citrea</i> NCIMB 1889	LGDLLKTDNEGRLLIVLGGYGHAGGDKPLVSYGGSDTWHDDIADGPPVYCTV
Rhein_1334	<i>Rheinheimera</i> sp. A13L	LGDLLTDDLGRLLIVLGGYGNAGGDEPLTSYGGSDTWHDDISDGPVYCTV
H527DRAFT_03370	<i>Aquimarina muelleri</i> DSM 19832	LGDLLTDDDEGRLLIVLGGYGHAGGNEPLTSYGGSDTWHDDISDGPVYCTI
PL2TA16_00557	<i>Pseudoalteromonas luteoviolacea</i> 2ta16	LGNILTDNEGRLLVVLGGFGNAGGNEPLESYGGADTWHDDIADGTVYCTV
PflaDRAFT_00041100	<i>Pseudoalteromonas flavipulchra</i> 2ta6	LGDILTDNEGRLLVVLGGKGNAGGNLPESYGGADTWHDDIADGTVYCTV
UY7DRAFT_03653	<i>Pseudoalteromonas flavipulchra</i> JG1	LGDILTDNEGRLLVVLGGKGNAGGNQPLESYGGADTWHDDIADGTVYCTV
PPIS_19511	<i>Pseudoalteromonas piscicida</i> JCM 20779	LGDILTDNEGRLLVVLGGKGNAGGNQPLESYGGADTWHDDIADGTVYCTV
G366DRAFT_02721	<i>Pseudoalteromonas piscicida</i> ATCC 15057	LGDILTDNEGRLLVVLGGKGNAGGNQPLESYGGADTWHDDIADGTVYCTV
Gei7105DRAFT_0285	<i>Geitlerinema</i> sp. PCC 7105	LGTLLKTDSSGRLLVVLGGFGKSGGDLPLSSYGGADTWYDDISDGSVTCVI
Nha1_1391	<i>Nitrosococcus halophilus</i> Nc4	LGTIKTDREGRLLVGLGAYGRAGGDEPITSYGGADTWYDDIADGPVECTV
F460DRAFT_04769	<i>Duganella zoogloeoides</i> ATCC 25935	LGMERTDSAGNLLVIGAYGRAGGIDPITGFGGGDTWNDDIADGPVATV
2520384729*	<i>Nitrolancetus hollandicus</i> Lb	LGDLLTADGRLLVVLGGFGKAGGSEPITSFAGADTWHDDVSDGPVSKL
G559DRAFT_00896	<i>Pseudomonas resinovorans</i> DSM 21078	LGMERTDQQGRLLVVLGGYGHAGGNQSITSFAGADGWHDDISDGPVCTL
CC1582_00022990	<i>Pseudomonas viridaflava</i> CC1582	LGGVLTDNKGRLLVVLGGYGHAGGDQSITSFAGADTWHDDTSDGPVCTL
TA043_00024900	<i>Pseudomonas viridaflava</i> TA043	LGGVLTDKKGRLLVVLGGYGHAGGDQSITSFAGADTWHDDTSDGPVCTL

Blue, consensus 100%; Red, >90%; h: hydrophobic residue; 1, G or S; 2, Y or F; 3, G or A; 4, S or A

*, IMG gene identification