

Supporting Information

Discovery of an L-Fucono-1,5-Lactonase from cog3618 of the Amidohydrolase Superfamily

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Table S1: Predicted L-fucono-1,5-lactonase genes inferred from homology

GI	Organism	Locus Tag	% identity to Bmulj_04915
21225440	<i>Streptomyces coelicolor</i> A3(2)		40
21233488	<i>Xanthomonas campestris</i> pv. <i>campestris</i> str. ATCC 33913	XCC4066	36
21244902	<i>Xanthomonas axonopodis</i> pv. <i>citri</i> str. 306	XAC4185	39
27376236	<i>Bradyrhizobium japonicum</i> USDA 110	blr1125	38
29827946	<i>Streptomyces avermitilis</i> MA-4680	SAV_1405	42
29833828	<i>Streptomyces avermitilis</i> MA-4680	SAV_7286	40
32476116	<i>Rhodopirellula baltica</i> SH 1		40
53721815	<i>Burkholderia pseudomallei</i> K96243	BPSS0791	37
58584161	<i>Xanthomonas oryzae</i> pv. <i>oryzae</i> KACC 10331	XOO4538	39
66770453	<i>Xanthomonas campestris</i> pv. <i>campestris</i> str. 8004	XC_4156	36
76819468	<i>Burkholderia pseudomallei</i> 1710b	BURPS1710b_A2374	37
78049839	<i>Xanthomonas campestris</i> pv. <i>vesicatoria</i> str. 85-10	XCV4283	37
78061477	<i>Burkholderia</i> sp. 383	Bcep18194_B0627	87
83717860	<i>Burkholderia thailandensis</i> E264	BTH_II1605	36
84625932	<i>Xanthomonas oryzae</i> pv. <i>oryzae</i> MAFF 311018	XOO_4275	38
87200445	<i>Novosphingobium aromaticivorans</i> DSM 12444	Saro_2432	35
89054601	<i>Jannaschia</i> sp. CCS1	Jann_2110	37
89067917	<i>Oceanicola granulosus</i> HTCC2516	OG2516_05668	38
89901904	<i>Rhodoferax ferrireducens</i> T118	Rfer_3135	50
90417671	<i>Aurantimonas manganoxydans</i> SI85-9A1		37
90581203	<i>Vibrio angustum</i> S14	VAS14_18294	34
91777179	<i>Burkholderia xenovorans</i> LB400	Bxe_B2958	37
91788086	<i>Polaromonas</i> sp. JS666	Bpro_2213	31

107025688	Burkholderia cenocepacia AU 105459	Bcen_3331	89
107029209	Burkholderia cenocepacia AU 105	Bcen_6470	38
109897125	Pseudoalteromonas atlantica T6c	Patl_0798	41
110633962	Chelativorans sp. BNC1	Meso_1610	100
110680910	Roseobacter denitrificans Ch 114	RD1_3763	37
114798305	Hyphomonas neptunium ATCC 15444	HNE_2135	35
115351277	Burkholderia ambifaria AMMD	Bamb_1224	35
115359191	Burkholderia ambifaria AMMD	Bamb_4444	89
116619827	Candidatus Solibacter usitatus Ellin6076	Acid_0697	44
116687080	Burkholderia cenocepacia HI2424	Bcen2424_6705	38
116693130	Burkholderia cenocepacia HI2424	Bcen2424_5036	89
117164624	Streptomyces ambofaciens ATCC 23877	SAMR0460	42
118587846	Stappia aggregata IAM 12614	SIAM614_09733	35
120436055	Gramella forsetii KT0803	GFO_1704	41
124383148	Burkholderia mallei NCTC 10229	BMA10229_0824	37
126444884	Burkholderia pseudomallei 668	BURPS668_A1157	37
126447807	Burkholderia mallei NCTC 10247	BMA10247_A1787	37
126457121	Burkholderia pseudomallei 1106a	BURPS1106A_A1080	37
126731149	Sagittula stellata E-37	SSE37_21960	34
126737148	Roseobacter sp. SK209-2-6	RSK20926_11974	34
134097110	Saccharopolyspora erythraea NRRL 2338	SACE_0497	40
134279263	Burkholderia pseudomallei 305	BURPS305_5343	37
134292096	Burkholderia vietnamiensis G4	Bcep1808_3379	85
146156271	Flavobacterium johnsoniae UW101	Fjoh_4117	36
146195583	Bradyrhizobium sp. ORS 278	BRADO5952	39
146301853	Flavobacterium johnsoniae UW101	Fjoh_4117	36

146342777	Bradyrhizobium sp. ORS 278	BRADO5952	39
146402531	Acidiphilium cryptum JF-5	Acry_1856	37
146405519	Bradyrhizobium sp. BTAi1	BBta_1822	40
148253346	Bradyrhizobium sp. BTAi1	BBta_1822	40
148260850	Acidiphilium cryptum JF-5	Acry_1856	37
148569941	Roseiflexus sp. RS-1	RoseRS_3732	31
148657831	Roseiflexus sp. RS-1	RoseRS_3732	31
149195868	Lentisphaera araneosa HTCC2155	LNTAR_18288	39
149277118	Pedobacter sp. BAL39	PBAL39_09521	39
156232810	Roseiflexus castenholzii DSM 13941	Rcas_1499	34
156741482	Roseiflexus castenholzii DSM 13941	Rcas_1499	34
157368886	Serratia proteamaculans 568	Spro_0641	47
159185394	Agrobacterium tumefaciens str. C58	Atu2815	34
161520151	Burkholderia multivorans ATCC 17616	Bmul_3602	100
161787020	Gluconacetobacter diazotrophicus PAI 5	GDI2662	35
162148443	Gluconacetobacter diazotrophicus PAI 5	GDI_2662	35
162955562	Renibacterium salmoninarum ATCC 33209	RSal33209_3367	36
163757919	Hoeflea phototrophica DFL-43	HPDFL43_20952	35
163842086	Renibacterium salmoninarum ATCC 33209	RSal33209_3367	36
167573217	Burkholderia oklahomensis C6786	BokIC_010100025498	36
167588739	Burkholderia ubonensis Bu	BuboB_010100025635	75
167616389	Burkholderia thailandensis Bt4	BthaB_010100008821	36
167645514	Caulobacter sp. K31	Caul_1549	35
167723063	Burkholderia pseudomallei DM98	BpseD_010100028853	41
167742041	Burkholderia pseudomallei 14	Bpse14_010100028490	41
167827600	Burkholderia pseudomallei 9	Bpseu9_010100028217	41

167897671	Burkholderia pseudomallei 7894	Bpse7_010100028294	37
167922243	Burkholderia pseudomallei BCC215	BpseBC_010100027045	37
169819795	Burkholderia cenocepacia MC0-3	Bcenmc03_5248	88
170690989	Burkholderia graminis C4D1M	BgramDRAFT_0964	38
170734808	Burkholderia cenocepacia MC0-3	Bcenmc03_6311	39
170737607	Burkholderia cenocepacia MC0-3	Bcenmc03_5248	88
171316596	Burkholderia ambifaria MEX-5	BamMEX5DRAFT_1165	35
171992822	Burkholderia ambifaria MC40-6	BamMC406_1250	34
171996492	Burkholderia ambifaria MC40-6	BamMC406_4964	90
172060305	Burkholderia ambifaria MC40-6	BamMC406_1250	34
172063975	Burkholderia ambifaria MC40-6	BamMC406_4964	90
177840456	Opitutus terrae PB90-1	Oter_1423	42
182413242	Opitutus terrae PB90-1	Oter_1423	42
186473117	Burkholderia phymatum STM815	Bphy_4296	39
187920172	Burkholderia phytofirmans PsJN	Bphyt_5475	33
187921545	Burkholderia phytofirmans PsJN	Bphyt_6914	38
188579155	Xanthomonas oryzae pv. oryzae PXO99A	PXO_03263	38
188993663	Xanthomonas campestris pv. campestris str. B100	xccb100_4268	36
189353670	Burkholderia multivorans ATCC 17616	FUCL	100
190688454	Cellvibrio japonicus Ueda107	CJA_1133	34
192362289	Cellvibrio japonicus Ueda107	CJA_1133	34
196228306	Chthoniobacter flavus Ellin428	CfE428DRAFT_0337	44
206564115	Burkholderia cenocepacia J2315	BCAM2279	89
209543051	Gluconacetobacter diazotrophicus PAI 5	Gdia_0875	35
217419155	Burkholderia pseudomallei 576		37
221156413	Thermomicrobium roseum DSM 5159	trd_0245	34

221632278	<i>Thermomicrobium roseum</i> DSM 5159	trd_0245	34
222106233	<i>Agrobacterium vitis</i> S4	Avi_5130	36
222107024	<i>Agrobacterium vitis</i> S4	Avi_6094	36
225012444	<i>Flavobacteria bacterium</i> MS024-2A	Flav2ADRAFT_0699	36
225792604	<i>Acidobacterium capsulatum</i> ATCC 51196	ACP_3281	41
225874822	<i>Acidobacterium capsulatum</i> ATCC 51196	ACP_3281	41
227342884	<i>Sinorhizobium fredii</i> NGR234	NGR_c33720	36
237687111	<i>Teredinibacter turnerae</i> T7901	TERTU_1497	27
238025180	<i>Burkholderia glumae</i> BGR1	bglu_2g18510	27
238063427	<i>Micromonospora</i> sp. ATCC 39149	MCAG_04393	39
239820000	<i>Variovorax paradoxus</i> S110	Vapar_5317	38
247544836	<i>Paenibacillus</i> sp. JDR-2	Pjdr2_3214	39
247545185	<i>Paenibacillus</i> sp. JDR-2	Pjdr2_3571	39
254183156	<i>Burkholderia pseudomallei</i> 1655	BURPS1655_I0301	36
254254452	<i>Burkholderia dolosa</i> AUO158	BDAG_03751	89
254445687	<i>Verrucomicrobiae bacterium</i> DG1235	VDG1235_3934	38
254473858	<i>Pseudovibrio</i> sp. JE062	PJE062_3993	37
254477715	<i>Ruegeria</i> sp. R11	RR11_3556	37
254512709	<i>Rhodobacteraceae bacterium</i> KLH11	RKLH11_3304	38
254952228	<i>Dyadobacter fermentans</i> DSM 18053	Dfer_5740	37
255039472	<i>Dyadobacter fermentans</i> DSM 18053	Dfer_5740	37
255346881	<i>Pedobacter heparinus</i> DSM 2366	Phep_4016	40
255533897	<i>Pedobacter heparinus</i> DSM 2366	Phep_4016	40
255918853	<i>Actinosynnema mirum</i> DSM 43827	Amir_0397	43
256035944	<i>Chitinophaga pinensis</i> DSM 2588	Cpin_1992	46
256356012	<i>Catenulispora acidiphila</i> DSM 44928	Caci_0572	41

256360281	<i>Catenulispora acidiphila</i> DSM 44928	Caci_4918	41
256421036	<i>Chitinophaga pinensis</i> DSM 2588	Cpin_1992	46
257142944	<i>Burkholderia thailandensis</i> E264	BthaA_010200027538	36
260221329	<i>Curvibacter putative</i> symbiont of <i>Hydra magnipapillata</i>	Csp_A13880	50
261285066	<i>Paenibacillus</i> sp. Y412MC10	GYMC10_4819	34
270263843	<i>Serratia odorifera</i> 4Rx13	SOD_f00540	48
270507167	<i>Streptosporangium roseum</i> DSM 43021	Sros_2469	43
271963992	<i>Streptosporangium roseum</i> DSM 43021	Sros_2469	43
283437180	<i>Pirellula staleyi</i> DSM 6068	Psta_0937	38
283814050	<i>Kribbella flavida</i> DSM 17836	Kfla_6900	38
283814638	<i>Spirosoma linguale</i> DSM 74	Slin_0412	35
284035345	<i>Spirosoma linguale</i> DSM 74	Slin_0412	35
285017256	<i>Xanthomonas albilineans</i> GPE PC73	XALc_0445	36
288960372	<i>Azospirillum</i> sp. B510	AZL_a06370	36
289670743	<i>Xanthomonas campestris</i> pv. <i>musacearum</i> NCPPB 4381	XcampmN_010100020213	38
290955233	<i>Streptomyces scabiei</i> 87.22	SCAB_6521	38
290962724	<i>Streptomyces scabiei</i> 87.22	SCAB_84361	46
290963189	<i>Streptomyces scabiei</i> 87.22	SCAB_89131	36
291009911	<i>Saccharopolyspora erythraea</i> NRRL 2338	SeryN2_010100035810	40
293392989	<i>Serratia odorifera</i> DSM 4582	HMPREF0758_0642	48
293613584	<i>Coralimargarita akajimensis</i> DSM 45221	Caka_0715	42
294633786	<i>Streptomyces</i> sp. e14	SSTG_05786	40
295136183	<i>Zunongwangia profunda</i> SM-A87	ZPR_4361	35
295431136	<i>Caulobacter segnis</i> ATCC 21756	Cseg_1834	37
295439939	<i>Burkholderia</i> sp. CCGE1002	BC1002_5166	38
295835452	<i>Streptomyces</i> sp. SPB74	SSBG_01350	42

296026623	Tsukamurella paurometabola DSM 20162	Tpau_0756	36
296138489	Tsukamurella paurometabola DSM 20162	Tpau_0756	36
296533149	Roseomonas cervicalis ATCC 49957	HMPREF0731_1259	38
297154716	Streptomyces bingchenggensis BCW-1	SBI_01307	40
297161867	Streptomyces bingchenggensis BCW-1	SBI_08461	45
297163335	Streptomyces bingchenggensis BCW-1	SBI_09929	38
297180977	uncultured Rhodobacterales bacterium HF0070_10D05		30
297184415	uncultured alpha proteobacterium EB080_L58F04		33
297190348	Streptomyces pristinaespiralis ATCC 25486	SSDG_05839	41
297197130	Streptomyces svuceus ATCC 29083	SSEG_09523	43
297204806	Streptomyces svuceus ATCC 29083	SSEG_03134	37
298250329	Ktedonobacter racemifer DSM 44963		32
300073170	Herbaspirillum seropedicae SmR1	Hsero_1052	68
300076566	Herbaspirillum seropedicae SmR1	Hsero_4499	61
300718072	Erwinia billingiae Eb661	EbC_34970	47
300773726	Sphingobacterium spiritivorum ATCC 33861		37
300783763	Amycolatopsis mediterranei U32	AMED_1842	40
300784987	Amycolatopsis mediterranei U32	AMED_3085	39
302555691	Streptomyces viridochromogenes DSM 40736	SSQG_06920	39
304407144	Paenibacillus curdlanolyticus YK9	PaecuDRAFT_3474	38
305665304	Maribacter sp. HTCC2170	FB2170_03370	37

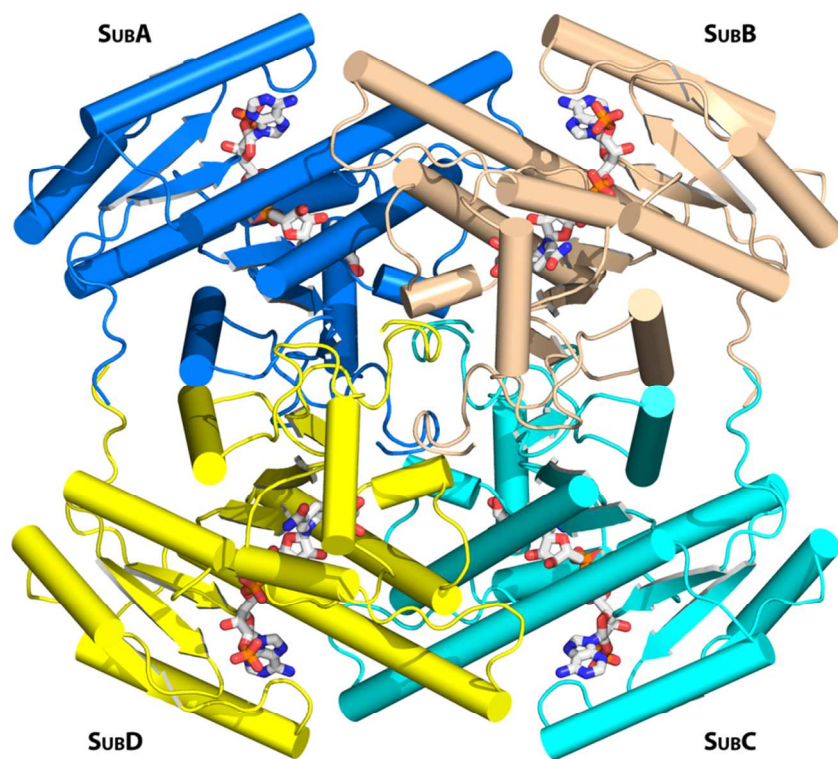


Figure S1 Oligomeric structure of BmulJ_04919 with bound NADP⁺ and L-fucose shown as sticks colored by atom type