Title: **The Natural History of Get3-like Chaperones**

Supplemental Information

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Supplemental materials

Table S1: Relates to Table 1. Contains the identifiers of the sequences based on which Table 1 was created. Column E marks the sequences used for the phylogenetic tree in Figure 1.

Table S2: Relates to Figure 4B and Figure 4C. Contains the identifiers of the sequences Figure 4B and 4C refers to.

Table S3: Relates to Figure 4D. Contains the corresponding data in bacterial phyla not shown in Figure 4D.

Table S4: Related to Figure 5E. Contains the data and the names of the taxons used in Figure 4E.

Supplemental Table Legends

Table S1: List of Get3 homologs used in the current study. The classification of each homolog based on the groups listed in Table 1 and the species they are found in are provided.

Table S2: List of Get3 homologs with a potential plastidial or mitochondrial localization used in the current study. The classification of each homolog based on the groups listed in Table 1 and their predicted localization based on TargetP 1.1 are provided. Abbreviations of predictions: C – chloroplast; M – mitochondria; - – no organelle predicted

Table S3: Distribution of the number of methionine residues in the region homologous to the sequence from helix 4 to 9 in *Sc*Get3 among bacteria containing Get3 homologs with an α-crystallin domain.

Table S4: Analysis of presence or absence of different types of Get3 or ArsA homologues, number of proteins, membrane proteins, and tail-anchored proteins in the indicated bacterial taxa.

Table S2

Group based on Table 1	Uniprot ID	Taxonomy	TargetP 1.1 prediction
Group 4	D8UKL0_VOLCA	Chlorophyta	C
Group 4	K8F9L6_9CHLO	Chlorophyta	C
Group 4	A0A090M8H3_OSTTA	Chlorophyta	M
Group 4	A4S2F3_OSTLU	Chlorophyta	-
Group 4	C1EGU4_MICCC	Chlorophyta	-
Group 4	C1MP51_MICPC	Chlorophyta	M
Group 4	E1Z6I9_CHLVA	Chlorophyta	-
Group 4	I0YX28_COCSC	Chlorophyta	M
Group 3	M1VA07_CYAM1	Rhodophyta	M
Group 3	M2XZS1_GALSU	Rhodophyta	-
Group 3	R7QLH0_CHOCR	Rhodophyta	-
Group 3	A0A176VLW2_MARPO	Embryophyta	C
Group 3	D8SQW5_SELML	Embryophyta	M
Group 3	D8RTG3_SELML	Embryophyta	C
Group 3	W1NHA6_AMBTC	Embryophyta	C
Group 3	A0A2G9GYH7_9LAMI	Embryophyta	C
Group 3	A0A2G9HKT1_9LAMI	Embryophyta	M
Group 3	S8E2Y5_9LAMI	Embryophyta	M
Group 3	A0A022Q8P4_ERYGU	Embryophyta	C
Group 3	A0A022RIQ3_ERYGU	Embryophyta	C
Group 3	A0A1J6ITG7_NICAT	Embryophyta	C
Group 3	A0A1U7XLU8_NICSY	Embryophyta	C
Group 3	A0A1U8F339_CAPAN	Embryophyta	C
Group 3	A0A1S3Z6A3_TOBAC	Embryophyta	C
Group 3	A0A1U7XLE1_NICSY	Embryophyta	C
Group 3	A0A1S3X3L0_TOBAC	Embryophyta	M
Group 3	A0A1S4CJ63_TOBAC	Embryophyta	C
Group 3	K4DAD9_SOLLC	Embryophyta	C
Group 3	M1AE76_SOLTU	Embryophyta	M
Group 3	M1AE77_SOLTU	Embryophyta	M
Group 3	A0A0A0KWR9_CUCSA	Embryophyta	C
Group 3	A0A1S3BFJ9_CUCME	Embryophyta	C
Group 3	A0A2I4FAM5_JUGRE	Embryophyta	C
Group 3	A0A2I4GLQ3_JUGRE	Embryophyta	-
Group 3	A0A2I4GLR1_JUGRE	Embryophyta	C
Group 3	A0A1S2YK80_CICAR	Embryophyta	M
Group 3	A0A1S3E4U6_CICAR	Embryophyta	C
Group 3	A0A072UVY6_MEDTR	Embryophyta	C
Group 3	G7I505_MEDTR	Embryophyta	C
Group 3	A0A072VNY3_MEDTR	Embryophyta	C
Group 3	A0A2K3NMY2_TRIPR	Embryophyta	M
Group 3	A0A2K3LCV4_TRIPR	Embryophyta	M
Group 3	I1LCZ2_SOYBN	Embryophyta	C
Group 3	I1NHH3_SOYBN	Embryophyta	C
Group 3	A0A1S3V658_VIGRR	Embryophyta	C
Group 3	V7BGY9_PHAVU	Embryophyta	C
Group 3	B9SY64_RICCO	Embryophyta	C
Group 3	A0A067LJE1_JATCU	Embryophyta	C
Group 3	A0A067LHD2_JATCU	Embryophyta	M
Group 3	A9PGI6_POPTR	Embryophyta	C
Group 3	A0A1Q3B3K7_CEPFO	Embryophyta	C
Group 3	A0A1Q3B3X1_CEPFO	Embryophyta	M
Group 3	A0A2P5D3Y8_TREOI	Embryophyta	C
Group 3	W9SYC9_9ROSA	Embryophyta	C
Group 3	W9S2I5_9ROSA	Embryophyta	M
Group 3	M5X6A8_PRUPE	Embryophyta	C
Group 3	A0A087H8G3_ARAAL	Embryophyta	C
Group 3	D7L8X8_ARALL	Embryophyta	C
Group 3	F4J3Q8_ARATH	Embryophyta	C
Group 3	A0A0D3AER6_BRAOL	Embryophyta	C
Group 3	V4M2J4_EUTSA	Embryophyta	C
Group 3	A0A087GCJ7_ARAAL	Embryophyta	M
Group 3	D7MUD3_ARALL	Embryophyta	M
Group 3	Q5XF80_ARATH	Embryophyta	M
Group 3	A0A0D3AKN9_BRAOL	Embryophyta	M
Group 3	R0EWE9_9BRAS	Embryophyta	M
Group 3	V4N939_EUTSA	Embryophyta	M
Group 3	A0A1R3HAK3_COCAP	Embryophyta	-
Group 3	A0A1R3J9V5_9ROSI	Embryophyta	-
Group 3	A0A2I0IRW4_PUNGR	Embryophyta	M
Group 3	A0A2I0J6S8_PUNGR	Embryophyta	M
Group 3	A0A0B0N3P8_GOSAR	Embryophyta	C
Group 3	A0A0D2SBJ4_GOSRA	Embryophyta	C
Group 3	A0A1U8N7T4_GOSHI	Embryophyta	C
Group 3	A0A0B0PPN1_GOSAR	Embryophyta	C
Group 3	A0A0D2RS72_GOSRA	Embryophyta	C
Group 3	A0A1U8KDC9_GOSHI	Embryophyta	C
Group 3	A0A0D2RYE9_GOSRA	Embryophyta	M
Group 3	A0A059BHV7_EUCGR	Embryophyta	C
Group 3	A0A059AC89_EUCGR	Embryophyta	M
Group 3	V4SPJ7_9ROSI	Embryophyta	-
Group 3	A0A1U7ZL42_NELNU	Embryophyta	C
Group 3	A0A200R5Q6_9MAGN	Embryophyta	C
Group 3	A0A2G5D279_AQUCA	Embryophyta	C
Group 3	A0A2H3XHX9_PHODC	Embryophyta	C
Group 3	A0A2H3YRJ4_PHODC	Embryophyta	M
Group 3	A0A2H9ZUZ8_9ASPA	Embryophyta	M
Group 3	I1IFB4_BRADI	Embryophyta	M
Group 3	I1IYH4_BRADI	Embryophyta	M
Group 3	J3LH15_ORYBR	Embryophyta	M
Group 3	C5XYT4_SORBI	Embryophyta	M
Group 3	C5Y9U4_SORBI	Embryophyta	M
Group 3	B4FXM9_MAIZE	Embryophyta	M
Group 3	B6TZB7_MAIZE	Embryophyta	M
Group 3	K3YT13_SETIT	Embryophyta	M
Group 3	A0A1E5WCP2_9POAL	Embryophyta	M
Group 3	M0TT67_MUSAM	Embryophyta	C
Group 3	A0A0K9PK69_ZOSMR	Embryophyta	C
Group 2	A0A250XGS9_9CHLO	Chlorophyta	M
Group 2	A0A2J8A6T7_9CHLO	Chlorophyta	M
Group 2	ASNA1_CHLRE	Chlorophyta	M
Group 2	A0A150GLK6_GONPE	Chlorophyta	C
Group 2	A0A087SRG6_AUXPR	Chlorophyta	M
Group 2	A0A2P6TQD2_CHLSO	Chlorophyta	C
Group 2	M2XUU5_GALSU	Rhodophyta	M
Group 2	M1UWD0_CYAM1	Rhodophyta	-
Group 2	A0A1X6PKT4_PORUM	Rhodophyta	C
Group 2	R7QK77_CHOCR	Rhodophyta	C
Group 5	I1ID51_BRADI	Embryophyta	C
Group 5	J3LGE0_ORYBR	Embryophyta	C
Group 5	A3AAM6_ORYSJ	Embryophyta	C
Group 5	K3YSP5_SETIT	Embryophyta	M
Group 5	C5XZY5_SORBI	Embryophyta	M
Group 5	M7YIF9_TRIUA	Embryophyta	-
Group 5	A0A1D6HI20_MAIZE	Embryophyta	C
Group 5	A0A2I0AHV9_9ASPA	Embryophyta	M
Group 5	A0A2H3XRX0_PHODC	Embryophyta	C
Group 5	A0A0K9NU83_ZOSMR	Embryophyta	C
Group 5	A0A1J6IDG8_NICAT	Embryophyta	C
Group 5	A0A1S4CYI1_TOBAC	Embryophyta	C
Group 5	A0A1S3YPY0_TOBAC	Embryophyta	C
Group 5	A0A1U8ETJ7_CAPAN	Embryophyta	C
Group 5	A0A2G3B6J8_CAPCH	Embryophyta	C
Group 5	K4BXG6_SOLLC	Embryophyta	C
Group 5	D7KQU0_ARALL	Embryophyta	C
Group 5	A0A178WMJ2_ARATH	Embryophyta	C
Group 5	A0A087HR01_ARAAL	Embryophyta	C
Group 5	R0GLF8_9BRAS	Embryophyta	C
Group 5	A0A1S2Z867_CICAR	Embryophyta	C
Group 5	V4K9A9_EUTSA	Embryophyta	C
Group 5	K7K7G9_SOYBN	Embryophyta	C
Group 5	A0A1J7IV84_LUPAN	Embryophyta	C
Group 5	G7JX27_MEDTR	Embryophyta	C
Group 5	V7C5C5_PHAVU	Embryophyta	C
Group 5	A0A2K3PL22_TRIPR	Embryophyta	C
Group 5	M5XS14_PRUPE	Embryophyta	C
Group 5	W9R3Z1_9ROSA	Embryophyta	M
Group 5	A0A2P5DQ30_PARAD	Embryophyta	M
Group 5	A0A2P5ENF6_TREOI	Embryophyta	M
Group 5	A0A1R3J603_COCAP	Embryophyta	C
Group 5	A0A1R3KIF2_9ROSI	Embryophyta	C
Group 5	S8DUW4_9LAMI	Embryophyta	-
Group 5	A0A0D2PSL0_GOSRA	Embryophyta	C
Group 5	A0A067KAR8_JATCU	Embryophyta	C
Group 5	W1P8W2_AMBTC	Embryophyta	C
Group 5	A0A2G5D7X1_AQUCA	Embryophyta	C
Group 5	A0A1Q3CBM7_CEPFO	Embryophyta	C
Group 5	A0A1S3BET7_CUCME	Embryophyta	C
Group 5	A0A059BF85_EUCGR	Embryophyta	C
Group 5	A0A2I4FWX0_JUGRE	Embryophyta	C
Group 5	A0A200Q3L2_9MAGN	Embryophyta	C
Group 5	A0A176VIM6_MARPO	Embryophyta	C
Group 5	A0A1U8A7V7_NELNU	Embryophyta	C
Group 5	D8QQV2_SELML	Embryophyta	-
Group 5	D8R829_SELML	Embryophyta	-

C: chloroplast; M: mitochondria; -: no organelle predicted

Table S3

Alpha-crystallin domain containing Get3 homologs in bacteria

	Number of Met residues between helix 4 and 9										
Bacterial phyla	0	1	2	3	4	5	6	7	8	9	11	Total
Acidobacteria							2					2
Actinobacteria	5	18	19	12	5	3						62
Aquificae				2	2	1	1					6
Bacteroidetes						2	1					3
Chlorobi				1	5	11	17	1	37	6		78
Chloroflexi			2	4		2	1		2	3		14
Cyanobacteria			3	1	24	16	30					74
Firmicutes			1	3	8	4	5	1	21	3	1	47
Fusobacteria				1	7							8
Proteobacteria		1			1	1		1				4
Spirochaetes			1		1							2
Thermodesulfobacteria					1							1
Total	5	19	26	24	54	40	57	3	60	12	1	301

Table S4

Uniprot taxon ID	Phylum	Get3 homolog with TRC40-insert	ArsA	Comment	Total proteins	Membrane proteins	TA proteins
Algibacter alginicilyticus	Bacteroidetes		yes		3236	741	25
Aquifex aeolicus	Aquificae	yes			1560	318	9
Bacillus cereus (strain ZK / E33L)	Firmicutes	yes	yes		5639	1688	48
Bacteroides thetaiotaomicron (strain ATCC 29148 / DSM 2079 / NCTC 10582 / E50 / VPI-5482)	Bacteroidetes		yes		4783	1176	37
Burkholderia multivorans (strain ATCC 17616 / 249)	Proteobacteria		yes		6043	1439	48
Chloracidobacterium thermophilum (strain B)	Acidobacteria	yes			3054	736	25
Chlorobaculum tepidum (strain ATCC 49652 / DSM 12025 / NBRC 103806 / TLS) (Chlorobium tepidum)	Chlorobi	yes			2251	464	42
Clostridium neonatale	Firmicutes		yes		4004	1024	19
Cutibacterium granulosum DSM 20700	Actinobacteria		yes		5074	1228	37
Desulfallas gibsoniae DSM 7213	Firmicutes	yes			4314	938	61
Desulfobacca acetoxidans (strain ATCC 700848 / DSM 11109 / ASRB2)	Proteobacteria	yes		double domain Get3 homolog	2862	714	30
Fusobacterium nucleatum subsp. nucleatum (strain ATCC 25586 / CIP 101130 / JCM 8532 / LMG 13131)	Fusobacteria	yes			2050	479	37
Klebsiella pneumoniae subsp. pneumoniae (strain ATCC 700721 / MGH 78578)	Proteobacteria		yes		5127	1245	43
Lactobacillus plantarum (strain ATCC BAA-793 / NCIMB 8826 / WCFS1)	Firmicutes		yes		3088	857	21
Leptospirillum ferrooxidans (strain C2-3)	Nitrospirae		yes		2414	583	17
Lysinibacillus macroides	Firmicutes		yes		4250	1097	26
Magnetospirillum caucaseum	Proteobacteria		yes		4651	873	37
Megasphaera cerevisiae DSM 20462	Firmicutes		yes		2843	622	36
Methylobacillus flagellatus (strain KT / ATCC 51484 / DSM 6875)	Proteobacteria		yes		2610	661	15
Myxococcus fulvus (strain ATCC BAA-855 / HW-1)	Proteobacteria	yes		double domain Get3 homolog	7269	1308	54
Nocardia farcinica (strain IFM 10152)	Actinobacteria	yes			5944	1267	35
Nostoc punctiforme (strain ATCC 29133 / PCC 73102)	Cyanobacteria	yes		double domain Get3 homolog	6608	1542	79
Pirellula staleyi (strain ATCC 27377 / DSM 6068 / ICPB 4128) (Pirella staleyi)	Planctomycetes		yes		4712	1304	46
Planctopirus limnophila (strain ATCC 43296 / DSM 3776 / IFAM 1008 / 290) (Planctomyces limnophilus)	Planctomycetes		yes		4259	1122	43
Planococcus plakortidis	Firmicutes	yes			3056	843	11
Roseiflexus castenholzii (strain DSM 13941 / HLO8)	Chloroflexi	yes			4325	1211	29
Salinicoccus halodurans	Firmicutes	yes	yes		2634	678	15
Treponema caldarium (strain ATCC 51460 / DSM 7334 / H1) (Spirochaeta caldaria)	Spirochaetes	yes			2755	755	9