SUPPORTING INFORMATION
FOR

MOLECULAR MECHANISMS OF BACTERIAL BIOLUMINESCENCE

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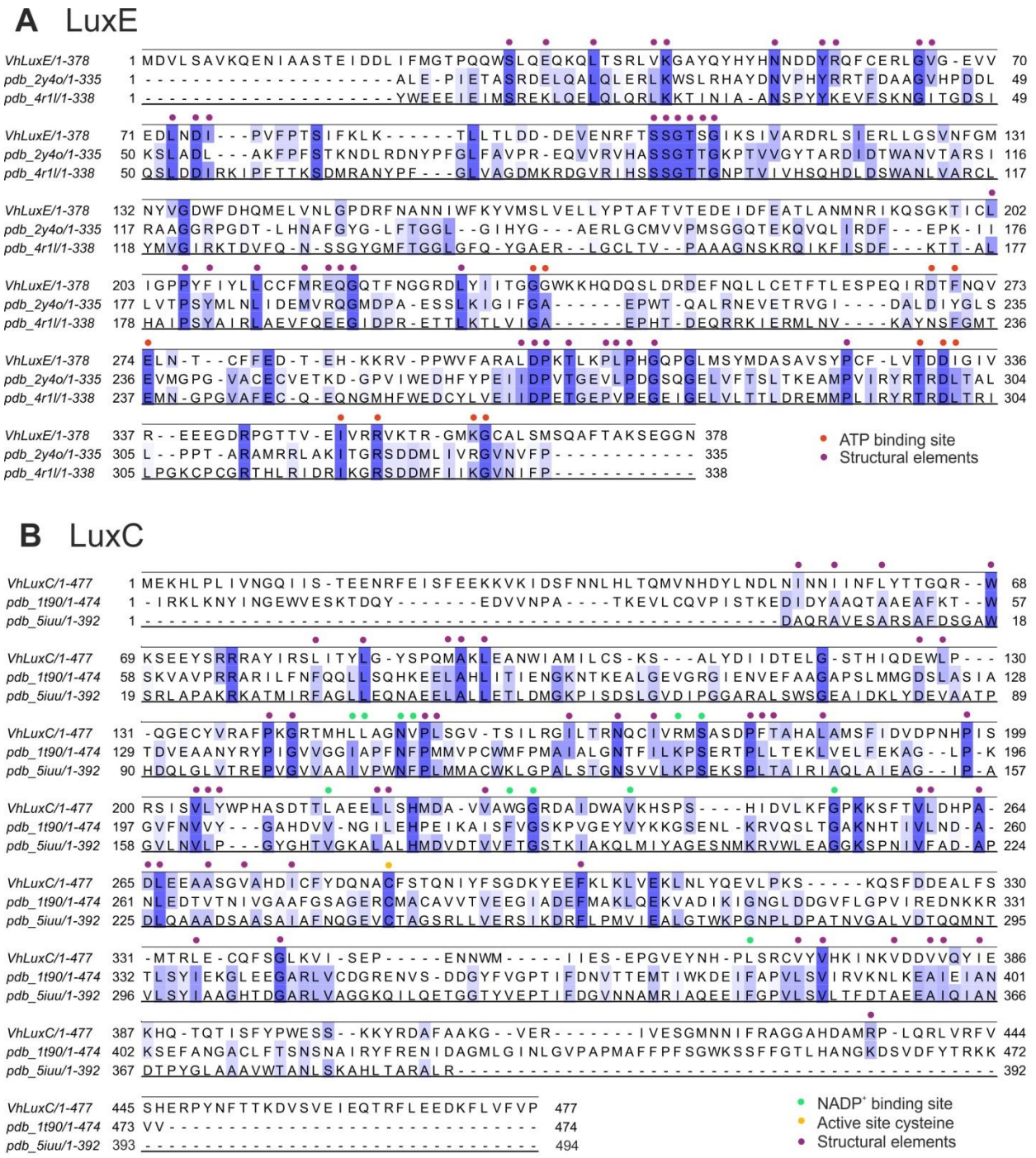

Supplementary Figure 1: Sequence alignments of LuxE (panel A) and LuxC (panel B) with two templates each that were used for the generation of homology models using the SWISS-MODEL server [80]. The aligned proteins are LuxE from *V. harveyi* (UniProt identifier B2XS33), phenylacetate-CoA ligase from *Burkholderia cenocepacia* (B4EL89, pdb 2Y4O) and acyl-CoA ligase from *Bacteroides thetaiotaomicron* (Q8AAN6, pdb 4R1L) in panel A as well as LuxC from *V. harveyi* (P08639), methylmalonate semialdehyde dehydrogenase from *Bacillus subtilis* (P42412, pdb 1T90) and apo indole-3-acetaldehyde dehydrogenase from *Pseudomonas syringae* (Q88BC5, pdb 5IUU) in panel B. The alignment was performed by the SWISS-MODEL server after selecting the corresponding models and visualized using Jalview [86]. Conserved regions are highlighted in shades of blue, with darker hues indicating higher conservation. Colored dots

above these regions indicate the primary reason for conservation and are classified according to the legend in each panel to either structurally important elements or functional regions involved in cofactor binding or active site formation.

Supplementary Table 1: List of bioluminescent bacterial strains with available *lux* operon sequence

No	strain	GenBank accession no	available sequence information
1	*Photobacterium leiognathi subsp. mandapamensis* ATCC 27561	DQ988878	*luxC*DABFEG, ribEBHA**
2a	*Photobacterium mandapamensis* ajapo.4.20_copy1	EU122285	*luxCDABFEG, ribEBHA*
2b	*Photobacterium mandapamensis* ajapo.4.20_copy2	EU122286	*luxCDABEG, ribEBHA*
3	*Photobacterium leiognathi subsp. mandapamensis* PL-721	DQ988877.2	*luxC*DABFEG, ribEBHA**
4	*Photobacterium phosphoreum* ATCC 11040	DQ988873	*luxCDABFEG, ribBHA**
5	*Photobacterium phosphoreum* (NBRC 104104)	AB367391.1	*luxCDABFEG*
6	*Photobacterium phosphoreum* FS-1.1	AY849486.2	*luxC*DABFEG, ribB*
7	*Photobacterium phosphoreum* (NBRC 13896)	AB104437.1	*luxCDABFEG, lumP*
8	*Photobacterium phosphoreum*	LC144829.1	*luxCDABFEG*
9	*Photobacterium leiognathi* ATCC 25521	M63594	*luxCDABEG*
10a	*Photobacterium leiognathi* lelon.2.1_copy1	EF536333.1	*luxCDABEG, ribEBHA, lumQ*
10b	*Photobacterium leiognathi* lelon.2.1_copy2	EF536334.1	*luxC*DABEG, ribEBHA*
11a	*Photobacterium leiognathi* lnuch.21.1	EF536335.1	*luxCDABEG, ribEBHA, lumQ*
11b	*Photobacterium leiognathi* lnuch.21.1	EF536336.1	*luxCDABEG, ribEBHA*
12	*Photobacterium aquimaris* (NBRC 104633)	JQ229765.1	*luxCDABFEG, ribEBHA**
13	*Photobacterium aquimaris* BS-1	JQ229766.1	*luxCDABFEG, ribEBHA, lumP*
14	*Photobacterium kishitanii* (pjapo.1.1)	DQ988874	*luxCDABFEG, ribEBHA**
15	*Photobacterium kishitanii* (NCIMB 844)	AY341064.2	*luxCDABFEG, ribEB*
16	*Photobacterium damselae* BT-6	EU122290.1	*luxD*ABE*
17a	*Photobacterium* lnuch.13.1_copy1	EF536338	*luxCDABEG, ribEBHA, lumQ*
17b	*Photobacterium* lnuch.13.1_copy2	EF536332	*luxCDABEG, ribEBHA, lumQ*
18	*Aliivibrio salmonicida*	AF452135	*luxCDABE, luxR, luxI, luxR2, ribG*
19	*Aliivibrio salmonicida* LFI1238	FM178380.1	*luxCDABEG, luxR, luxI*
20	*Aliivribrio fischeri* ATCC 7744	AY341062.2	*luxC*DABE**
21	*Aliivibrio fischeri* MJ-1	AF170104.1	*luxCDABEG, luxR, luxI*
22	*Aliivibrio fischeri* MJ11	CP001133.1	*luxCDABEG, luxR, lux, ribG*
23	*Aliivibrio logei* KCh1	HQ450520.1	*luxCDABE, luxR, luxI, luxR2*
24	*Vibrio vulnificus* VVL1 ATCC 43382	EU122289	*luxC*DABEG*
25	*Vibrio orientalis* ATCC 33934	EU556495.1	*luxCDABEG, luxH*
26	*Vibrio albensis* (NCIMB 41)	AB115761	*luxCDABEG*
27	*Vibrio harveyi* ATCC 14126	EU122288	*luxCDABEG, ribB**
28	*Vibrio harveyi* BCB440	EU192082.1	*luxCDABEG, luxH*
29	*Vibrio harveyi* ATCC 33843	CP009468.1	*luxCDABEG*
30	*Vibrio chagasii* 21N-12	EU122293.1	*luxD*ABE**
31	*Vibrio chagasii* SB-52	EU122294.1	*luxD*ABE**
32	*Vibrio campbellii* ATCC BAA-1116_1	CP006606.1	*luxCDABEG, luxH*
33	*Vibrio campbellii* ATCC BAA-1116_2	CP000790.1	*luxCDABEG, ribB*
34	*Vibrio campbellii* LA16-V1	CP021146.1	*luxCDABEG*
35	*Vibrio azureus* LC2-005 (NBRC 104587)	CP018617.1	*luxCDABEG*
36	*Vibrio* sp. BCB494	EU192084.1	*luxC*DABEG, luxH*
37	*Photorhabdus luminescens subsp. luminescens* ATCC 29999	M90093.1	*luxCDABE*
38	*Photorhabdus luminescens* Hw	M90092.1	*luxCDABE*
39	*Photorhabdus luminescens* ZM1	AF403784.1	*luxCDABE*
40	*Photorhabdus luminescens* HW	M62917.1	*luxCDABE**
41	*Photorhabdus luminescens subsp. laumondii* TTO1	BX571866.1	*luxCDABE*
42	*Photorhabdus asymbiotica* ATCC 43949	FM162591.1	*luxCDABE*
43	*Photorhabdus temperata subsp. thracensis* (DSM 15199)	CP011104.1	*luxCDABE*
44	*Shewanella hanedai* ATCC 33224	AB058949	*luxC*DABEG*
45	*Shewanella hanedai* (NCIMB 2157)	AB261992.1	*luxCDABEG, luxR, luxI*
46	*Shewanella woodyi*	AB368544.1	*luxCDABE*
47	*Shewanella woodyi* ATCC 51908	CP000961.1	*luxCDABEG*
48	*Candidatus* Photodesmus katoptron (Akat2007.1.1)	HQ333499.1	*luxCDABEG*
49	Bacterium symbiont of Cryptopsaras couesii	CP020663.1	*luxCDABEG*

* Indicates partial sequences.

a, b (in numbering) Indicates two copies of the *lux* operon in the same bacterial strain.