

Supplementary Materials

Supplementary Table 1. Correlation analysis of OMV content with larval metamorphosis rate and c-di-GMP content

	Larval metamorphosis		c-di-GMP content	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
OMV content	0.7295	0.0006***	0.7335	0.0019**

Supplementary Table 2. Correlation analysis of c-di-GMP content with LPS content of biofilms and OMVs

	LPS content of biofilms		LPS content of OMVs	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
C-di-GMP content	0.6357	0.0109*	0.6130	0.0151*

Supplementary Table 3. Correlation analysis of larval metamorphosis rate with LPS content of biofilms and OMVs

	LPS content of biofilms		LPS content of OMVs	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Larval metamorphosis	0.3912	0.0587	0.5643	0.0041**

Supplementary Table 4. Correlation analysis of larval metamorphosis rate with LPS content

	LPS content	
	<i>r</i>	<i>p</i>
Larval metamorphosis	0.7545	0.0305*

Supplementary Table 5. Strains, plasmids and primers in this study

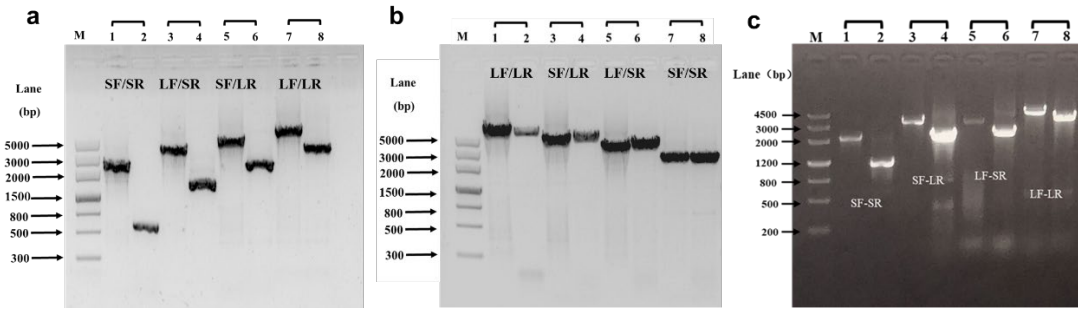
Strains or plasmids	Relevant characteristics	Source
Strains		
<i>P. marina</i> ECSMB14103	Wild-type	Ref 1.
<i>E. coli</i> WM3064	RP4(tra) in chromosome, DAP ^r	Ref 2.
$\Delta cdgB$	In-frame deletion of <i>cdgB</i>	This study
$\Delta cdgB::cdgB$	Complementation of <i>cdgB</i>	This study
Δlps	In-frame deletion of <i>lps</i>	This study
Plasmids		
pK18mobsacB-ery	pK18mobsacB containing the erythromycin resistant gene from pHT304, Kan ^r , Ery ^r	Ref 3.
pK18mobsacB-ery- <i>cdgB</i>	Recombinant plasmid for deleting <i>cdgB</i> genes	This study
pK18mobsacB-ery- <i>lps</i>	Recombinant plasmid for deleting <i>lps</i> genes	This study
pBBR1MCS-Cm	Broad-host-range vector containing the chloramphenicol resistant gene from pWD2	Ref 3.
PBBR1-Cm- <i>cdgB</i>	<i>cdgB</i> cloned into pBBR1MCS-Cm	This study
Primers		
In-frame deletions		
<i>cdgB</i> -up-F	CGCGGATCCTCGCCACGCTCGCATAC	
<i>cdgB</i> -up-R	CCGGAATTCAGATGATATTCTAAATAGTCATA	
<i>cdgB</i> -down-F	CCGGAATTCCTTGTAACCTCTTAGTCTT	
<i>cdgB</i> -down-R	ACATGCATGCAGTGGACGGCGGTCAG	
<i>cdgB</i> -L-F	ACAGGGCTATGGTCGTAC	
<i>cdgB</i> -L-R	ACCCTTTGCTTGCTCATC	
<i>cdgB</i> -S-F	ATGAACGATGGATGTAGC	
<i>cdgB</i> -S-R	GGACTGTGATCTACTTCGTA	
<i>lps</i> -up-F	CGCGGATCCTATAGGGAATCTTTAGGC	
<i>lps</i> -up-R	CCGGAATTCTTTGGAACCTGCTTTCGG	
<i>lps</i> -down-F	CCGGAATTCATAAATCTCGGTTGATAG	
<i>lps</i> -down-R	GCTCTAGACCTCTTACAGTGAGTGGC	
<i>lps</i> -L-F	CAGGACCAGTGATTGAACG	
<i>lps</i> -L-R	AATGGCGATACGCTTTACG	
<i>lps</i> -S-F	CTTGATAGCCAAATACCGT	
<i>lps</i> -S-R	TTTACTCCCTCAGGCAGAT	
Complementation		
<i>cdgB</i> -pBBR-F	CCGGAATTCCTTGTAACCTCTTAGTCTT	
<i>cdgB</i> -pBBR-R	ACGCGTCGACTATGACTATTTAGAATATCATCT	

Supplementary References

1. Peng, L.-H. et al. Complete genome of *Pseudoalteromonas marina* ECSMB14103, a mussel settlement-inducing bacterium isolated from the East China Sea. *Mar. Genomics*. **41**, 46-49 (2018).
2. Dehio, C. & Meyer, M. Maintenance of broad-host-range incompatibility group P and group Q plasmids and transposition of Tn5 in *Bartonella henselae* following conjugal plasmid transfer from *Escherichia coli*. *J. Bacteriol.* **179**, 538-540 (1997).
3. Wang, P. et al. Development of an efficient conjugation-based genetic manipulation system for *Pseudoalteromonas*. *Microb. Cell. Fact.* **14**, 1-11 (2015).

Supplementary Table 6. Dye used for confocal laser scanning microscopy and target

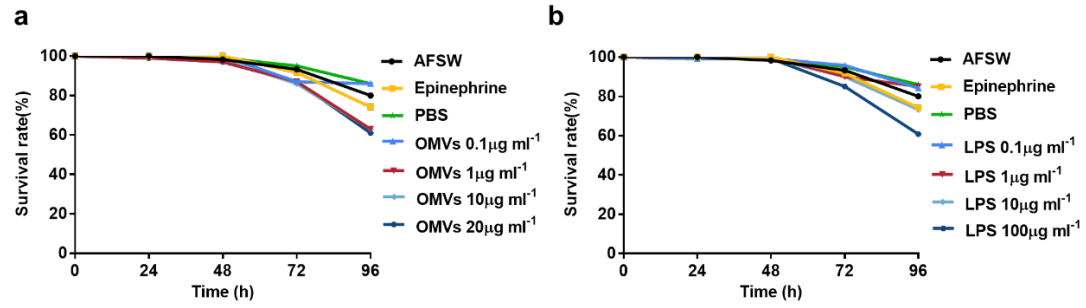
Dye	Target	Concentration	Detection wavelength
Propidium iodide (PI)	Dead cell	5 µg/mL	560-700 nm
Concanavalin A, tetramethylrhodamine conjugate (ConA-TMR)	α-polysaccharide	944.8 µg/mL	552-578 nm
Calcofluor white M2R (CFW)	β-polysaccharide	189 µg/mL	254-432 nm
DiIC18(5) oil, 1,1'-dioctadecyl-3,3,3',3'-tetramethylindodicarbocyanine perchlorate (DiD'oil)	Lipid	7.94 µg/mL	648-670 nm
Fluorescein isothiocyanate isomer I (FITC)	Protein	46.6 µg/Ml	495-519 nm



Supplementary Fig. 1. Identification of deleting (a) and complementary (b) the *cdgB* gene and deleting the *lps* gene (c) via PCR. Each panel depicts DNA bands derived from the same experiment, and they were processed in parallel.



Supplementary Fig. 2. Larvae in stationary (a), crawling (b) state and Metamorphosed larvae (c).



Supplementary Fig. 3. Survival rates during larval metamorphosis stimulated by OMVs (a) and LPS (b).