**Supporting data**

**Table S1. Several different phasins of the surface-associated proteins of PHB granules**

|  |  |  |  |
| --- | --- | --- | --- |
| **Phasin** | **Strain** | **Protein M.W. (kDa)** | **References** |
| PhaP1-PhaP7 | *Ralstonia eutropha* | 63.2-11.2 | 1,2 |
| PhaP | *Bacillus megaterium* | 19.9 | 3 |
| GA14 | *Rhodococcus ruber* | 142 | 4 |
| PhaF and PhaI | *Pseudomonas putida* | 28.3 and 15.3 | 5 |
| FA8 | *Azeotobacter sp.* | 21.7 | 6 |
| PhaP | *Aeromonas hydrophila* | 13.5 | 7 |

**References:**

1 Wieczorek R, Pries A, Steinbüchel A, Mayer F. Analysis of a 24-kilodalton protein associated with the polyhydroxyalkanoic acid granules in *Alcaligenes eutrophus*. J Bacteriol. 1995;177:2425-2435.

2 Pfeiffer D, Jendrossek D. Localization of poly (3-hydroxybutyrate) (PHB) granule-associated proteins during PHB granule formation and identification of two new phasins, PhaP6 and PhaP7, in *Ralstonia eutropha* H16. J Bacteriol. 2012;194:5909-5921.

3 McCool GJ, Cannon MC. Polyhydroxyalkanoate inclusion body-associated proteins and coding region in *Bacillus megaterium*. J Bacteriol. 1999;181:585-592.

4 Pieper-Fürst U, Madkour MH, Mayer F, Steinbüchel A. Purification and characterization of a 14-kilodalton protein that is bound to the surface of polyhydroxyalkanoic acid granules in *Rhodococcus ruber. J Bacteriol.* 1994;176:4328-4337.

5 Prieto MA, Bühler B, Jung K, Witholt B, Kessler B. PhaF, a polyhydroxyalkanoate-granule-associated protein of *Pseudomonas oleovorans* GPo1 involved in the regulatory expression system for pha genes. J Bacteriol. 1999;181:858-868.

6 Mezzina MP, Wetzler DE, Catone MV, Bucci H, Di Paola M, Pettinari MJ. A phasin with many faces: structural insights on PhaP from *Azotobacter sp.* FA8. PLoS One. 2014;9:e103012.

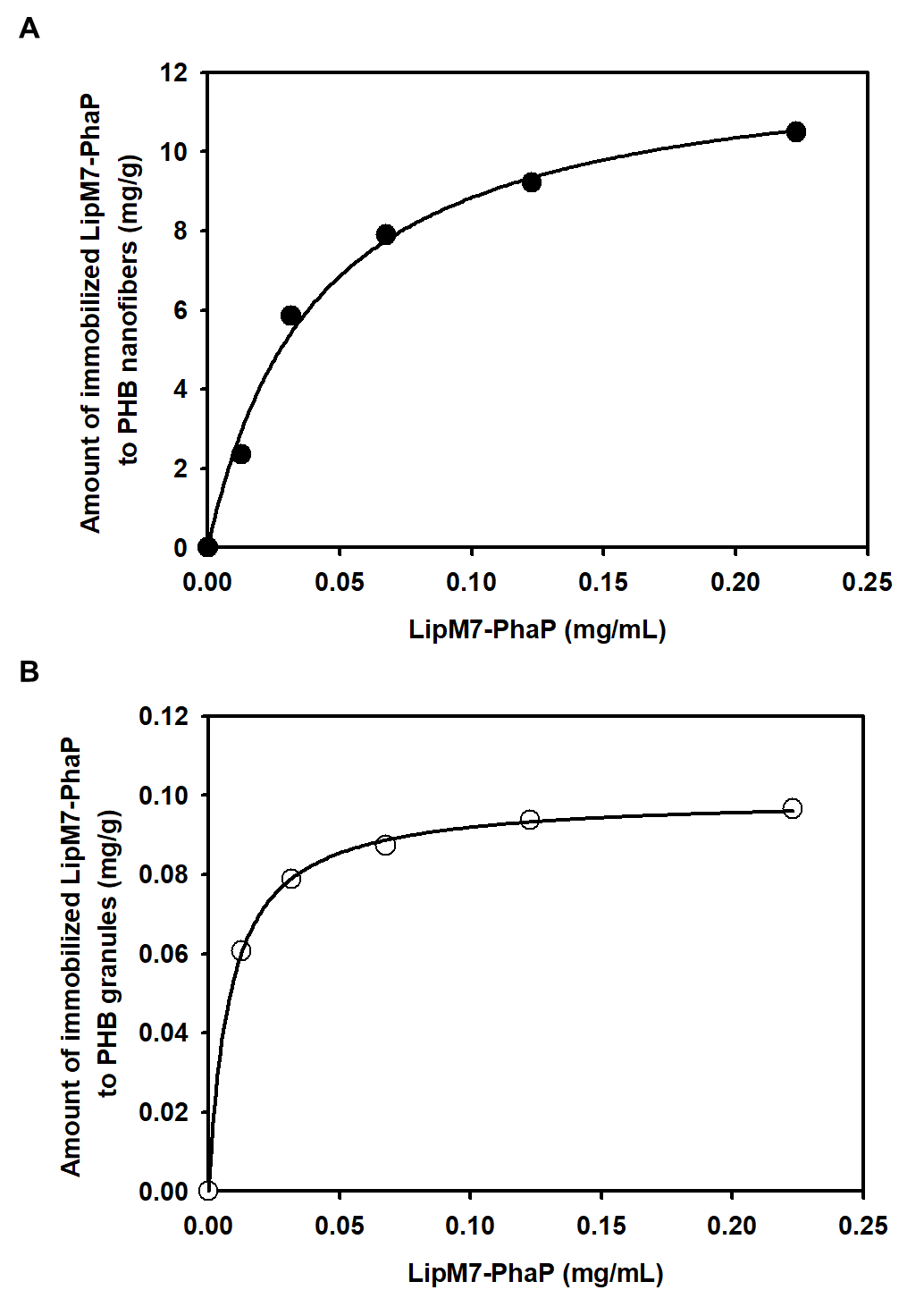
7 Zhao H, Wei H, Liu X, Yao Z, Xu M, Wei D, et al. Structural insights on PHA binding protein PhaP from *Aeromonas hydrophila*. Sci Rep. 2016;6:39424.

**Table S2. Metagenomic lipase LipM7**

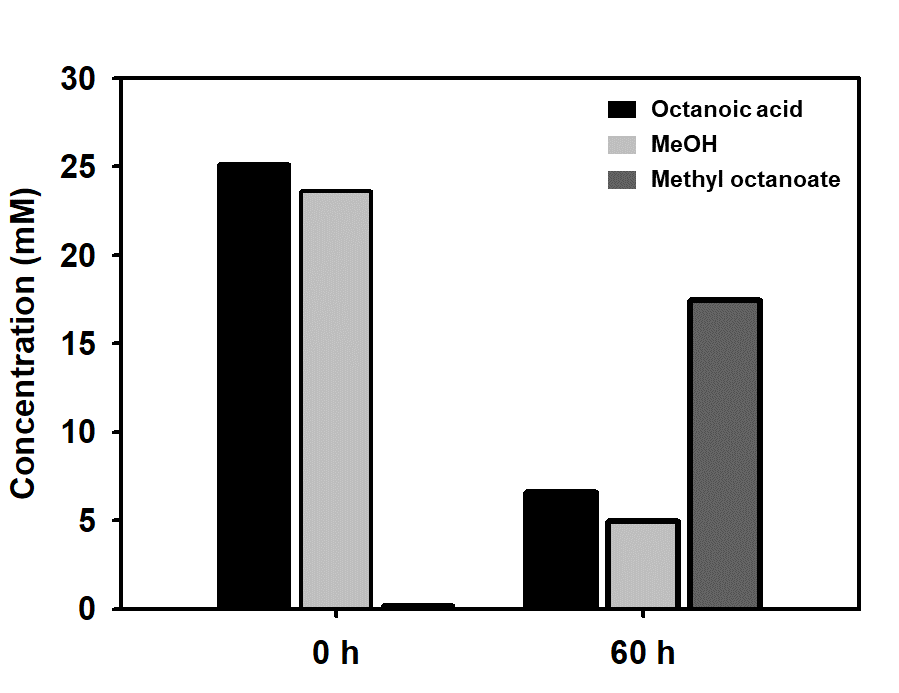
|  |  |
| --- | --- |
| Nucleotide sequence of *lipM7*  (879 bp) | ATGCCTAGTGAGGAACATGAAGCCATTGTCGCCATGGTGCAGGCGAGCCCGCCGGGAGCAGGCAGCATAGAAGAGTCGCGTGCCGGTTTTGACGCCATGTTGTCGATGTTTCCGCTGCCGGATGATGTGGACATCGAAGAGATCAATATCCAGCACATCAATGCGGATTGGGTCAGCGTCCCGGAGACGATGGATAGCCGGGTGGTGTTGTATCTCCACGGCGGCGGCTACGTGATCGGCAATAACGTCGGCTATCGCGAGTTTGCCTCGCGCGTGGCCCGGGCAACCAAATCCCGGGTGTTGTTGATCAACTATCGGCTGGCGCCGGAGAATCCATTTCCGGCTGCGGTAGACGATGCGGTGATGGCCTATCGCTGGCTGTTGGAACAGGGTACACCGGCAGAGCAGCTCATGGTGGCGGGTGACTCTGCCGGCGGCGGACTCACCCTGGCGACGCTGGTGGCATTGCGTGACGGCGGTGCGCCGATGCCTGCGTGTGCGACCTGTTTTTCACCCTGGGTGGACCTGGAAGGCGGGGGTGACTCCGCCCAACCCGGTGCCGTAGATGACCCCATGATTGGCGTGCAAGGGCTGCAGGACATGGGGCGACACTACGCCGGTGATGATATGCGAAATCCTCTGGCCGCACCGTTGTATGCGGATCTCTCGGGATTGCCGCCGCTGCAGGTGTTTGCAGGTACCCGGGAAGTTCTGCTGAGTGATTCCACCCGTATTGTCGACAATGCCCAGGCTGCCGGTGTAAACGCCTCATTGACCGTCGGCGACGGTTTGATTCACGTCTGGCAGTTGTTCGGCAATGTACCGGAAGCGGCGGAGTCTTTGCAGCAGGTAGCCGAGTTCGCGGACAAACACCTGCCT |
| Amino acid sequence of *lipM7*  (293 a.a.) | MPSEEHEAIVAMVQASPPGAGSIEESRAGFDAMLSMFPLPDDVDIEEINIQHINADWVSVPETMDSRVVLYLHGGGYVIGNNVGYREFASRVARATKSRVLLINYRLAPENPFPAAVDDAVMAYRWLLEQGTPAEQLMVAGDSAGGGLTLATLVALRDGGAPMPACATCFSPWVDLEGGGDSAQPGAVDDPMIGVQGLQDMGRHYAGDDMRNPLAAPLYADLSGLPPLQVFAGTREVLLSDSTRIVDNAQAAGVNASLTVGDGLIHVWQLFGNVPEAAESLQQVAEFADKHLP |

**Table S3. Primers used to clone the recombinant proteins**

|  |  |  |
| --- | --- | --- |
| **Gene** | **Primers** | **Sequences (5’ to 3’)** |
| PhaP | PhaP NdeI-Forward | GGAATTCCATATGAATATGGATGTGATTAAAAGT |
| PhaP XhoI-Reverse | CCGCTCGAGTTATTAATGGTGATGGTGATGGTGGGCTTTACCAGTGCTTTTCTT |
| sfGFP | sfGFP NdeI-Forward | GGAATTCCATATGCAGAGCAAAGGCGAAGAACTG |
| sfGFP XhoI-Reverse | CCGCTCGAGTTATTAATGGTGATGGTGATG |
| LipM7 | LipM7 NdeI-Forward | GGAATTCCATATGCCTAGTGAGGAACATGAA |
| LipM7 XhoI-Reverse | CCGCTCGAGTTAATGGTGATGGTGATGGTGAGGCAGGTGTTTGTCCGCGAA |
| sfGFP-PhaP | sfGFP NdeI-Forward | GGAATTCCATATGCAGAGCAAAGGCGAAGAACTG |
| sfGFP HindIII-Reverse | CCCAAGCTTTTTATACAGTTCATCCATGCC |
| PhaP HindIII-Forward | CCCAAGCTTAATATGGATGTGATTAAAAGT |
| PhaP XhoI-Reverse | CCGCTCGAGTTATTAATGGTGATGGTGATGGTGGGCTTTACCAGTGCTTTTCTT |
| PhaP-sfGFP | PhaP NdeI-Forward | GGAATTCCATATGAATATGGATGTGATTAAAAGT |
| PhaP HindIII-Reverse | CCCAAGCTTGGCTTTACCAGTGCTTTTCTT |
| sfGFP HindIII-Forward | CCCAAGCTTCAGAGCAAAGGCGAAGAACTG |
| sfGFP XhoI-Reverse | CCGCTCGAGTTATTAATGGTGATGGTGATG |
| LipM7-PhaP | LipM7 NdeI-Forward | GGAATTCCATATGCCTAGTGAGGAACATGAA |
| LipM7 HindIII-Reverse | CCCAAGCTTAGGCAGGTGTTTGTCCGC |
| PhaP HindIII-Forward | CCCAAGCTTAATATGGATGTGATTAAAAGT |
| PhaP XhoI-Reverse | CCGCTCGAGTTATTAATGGTGATGGTGATGGTGGGCTTTACCAGTGCTTTTCTT |
| PhaP-LipM7 | PhaP NdeI-Forward | GGAATTCCATATGAATATGGATGTGATTAAAAGT |
| PhaP HindIII-Reverse | CCCAAGCTTGGCTTTACCAGTGCTTTTCTT |
| LipM7 HindIII-Forward | CCCAAGCTTCCTAGTGAGGAACATGAA |
| LipM7 XhoI-Reverse | CCGCTCGAGTTAATGGTGATGGTGATGGTGAGGCAGGTGTTTGTCCGCGAA |

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**Figure S1. Langmuir isotherm analysis of LipM7-PhaP binding onto PHB nanofibers (A) and granular PHB supports (B).**

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**Figure S2. Conversion of octanoic acid to methyl octanoate by LipM7-PhaP-PHB nanofibers.**