**Supplementary file 1**

**Structure and mechanism of a phage-encoded SAM lyase revises catalytic function of enzyme family**

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**Content:**

**Supplementary tables**

**Supplementary file 1-table 1:** Sequences of Svi3-3 constructs in this study

|  |  |  |
| --- | --- | --- |
| Protein | Length (amino acids) | Sequence |
| Svi3-3\_d19 | 165 | MSGSHHHHHHGSSGENLYFQSLMERLGGGGFSARIFVGLNVGDKPTYTIE  DVVKDTIAIKRQGILPDASFVAQRGVYTEQRSGQLVTENSVQIIIIDLEG  LSKEDFTGKVQALGKELREDFKQESVIVEIQERGIVQDVYSITAEWYEEG  PMRPLRVDLQPSLIS |
| Svi3-3\_d19 after TEV cleavage | 146 | SLMERLGGGGFSARIFVGLNVGDKPTYTIEDVVKDTIAIRKRQGILPDAS  FVAQRGVYTEQRSGQLVTENSVQIIIIDLEGLSKEDFTGKVQALGKELRE  DFKQESVIVEIQERGIVQDVYSITAEWYEEGPMRPLRVDLQPSLIS |

**Supplementary file 1-table 2**: *In vivo* complementation assay using different variants of T3 SAMase, present on the chromosome

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Strain | Genotype | M9 minimal media + Arabinose (%) | | | |
| 0 | 0.01 | 0.05 | 0.1 |
| DA5438 | wild-type | growth | growth | growth | growth |
| DA41453 | *ΔilvA* | no growth | no growth | no growth | no growth |
| DA67469 | *ΔilvA*+ T3S | no growth | growth | growth | growth |
| DA67467 | *ΔilvA*+ T3S E67Q | no growth | no growth | growth | growth |
| DA67468 | *ΔilvA* +T3S E68Q | no growth | no growth | no growth | growth |

**Supplementary file 1-table 3:** Primer sequences

|  |  |
| --- | --- |
| **Primer name** | **Sequence** |
| Svi3-3\_d19f | ATGGAACGTCTCGGCGGCGG |
| Svi3-3\_r1 | CTCAACTAATTAAGCTTGGCTGCAGG |
| Svi3-3\_Y58F\_f | GCTGCTCGGTGAAGACGCCGCGC |
| Svi3-3\_Y58F\_r | GCGCGGCGTCTTCACCGAGCAGC |
| Svi3-3\_E69A\_f | ACAGCTCGTCACGGCGAACTCGGTCCAGATCATC |
| Svi3-3\_E69A\_r | GATGATCTGGACCGAGTTCGCCGTGACGAGCTGT |
| Svi3-3\_E105Q\_f | CCACGATGACGCTCTGCTGCTTGAAATCCTC |
| Svi3-3\_E105Q\_r | GAGGATTTCAAGCAGCAGAGCGTCATCGTGG |
| araBAD\_cat\_sacB\_F | AGTATAGCCTGGTTTCGTTTGATTGGCTGTGGTTTTATACAGTCAGTGTAGGCTGGAGCTGCTTC |
| araBAD\_cat\_sacB\_R | TCTCTACTGTTTCTCCATACCCGTTTTTTTGGATGGAGTGAAACGCATATGAATATCCTCCTTAGTTCC |
| T3SAM\_int\_catsacBF | CGTGCCGCACCGGGTCTTTATGGCTCCGTTGAGTCAACCGATTTG GTGTAGGCTGGAGCTGCTTC |
| T3SAM\_int\_catsacBR | TTCCTCAGTTGGTGCGCTTGAGATTGCCTCACGATAGCACCCGGTCATATGAATATCCTCCTTAGTTCC |
| ara\_t3\_SAMF | TCTCTACTGTTTCTCCATACCCGTTTTTTTGGATGGAGTGAAACGATGATTTTCACTAAAGAGCCTG |
| ara\_t3\_SAMR | AGTATAGCCTGGTTTCGTTTGATTGGCTGTGGTTTTATACAGTCA TTATTGTACTTGCCAGCGGCGACC |
| Test\_primer\_f | ACCCCGCTTATTAAAAGCAT |
| Test\_primer\_r | AAATCCATCAAAAAACCAGG |