

**Table S7 :** *Bacillus subtilis* PTA-271 encoding genes for PKS and other acetyltransferases

| Locus tag ID                          | Gene                | Function   |
|---------------------------------------|---------------------|--|
| <i>Polyketide related genes</i>       |                     |  |
| S19-40_00196                          | pksS                | Polyketide biosynthesis cytochrome P450 PksS                               |
| S19-40_00197                          | pksR                | Polyketide synthase PksR   |
| S19-40_00198                          | pksN                | Polyketide synthase PksN   |
| S19-40_00199                          | pksM                | Polyketide synthase PksM   |
| S19-40_00200                          | pksL                | Polyketide synthase PksL   |
| S19-40_00201                          | pksJ                | Polyketide synthase PksJ   |
| S19-40_00202                          | pksI                | Putative polyketide biosynthesis enoyl-CoA isomerase PksI                  |
| S19-40_00203                          | pksH                | putative polyketide biosynthesis enoyl-CoA hydratase PksH                  |
| S19-40_00204                          | pksG                | Polyketide biosynthesis 3-hydroxy-3-methylglutaryl-ACP synthase PksG       |
| S19-40_00205                          | pksF                | Polyketide biosynthesis malonyl-ACP decarboxylase PksF                     |
| S19-40_00206                          | acpK                | Polyketide biosynthesis acyl-carrier-protein AcpK                          |
| S19-40_00207                          | pksE                | Polyketide biosynthesis protein PksE                                       |
| S19-40_00208                          | pksD                | Polyketide biosynthesis acyltransferase PksD                               |
| S19-40_00210                          | pksC                | Polyketide biosynthesis malonyl CoA-acyl carrier protein transacylase PksC |
| S19-40_00211                          | pksB                | putative polyketide biosynthesis zinc-dependent hydrolase PksB             |
| S19-40_01385                          | pksS                | Polyketide biosynthesis cytochrome P450 PksS                               |
| <i>Acyl transferase related genes</i> |                     |  |
| S19-40_00207                          | pfaD                | Acyl transferase domain protein  |
| S19-40_00208                          | fabD                | Malonyl CoA-acyl carrier protein transacylase                              |
| S19-40_00210                          | fabD                | Acyl transferase domain protein  |
| S19-40_00210                          | pksC                | Polyketide biosynthesis malonyl CoA-acyl carrier protein transacylase PksC |
| S19-40_00328                          | fabD                | Malonyl CoA-acyl carrier protein transacylase                              |
| S19-40_00328                          | fabD                | Malonyl CoA-acyl carrier protein transacylase                              |
| S19-40_02881                          | DBT, bkdB           | 2-oxoisovalerate dehydrogenase E2 component (dihydrolipoyl transacylase)   |
| S19-40_03846                          | -                   | Penicillin acylase   |
| <i>Keto related genes</i>             |                     |  |
| S19-40_00120                          | tkt                 | Transketolase  |
| S19-40_00205                          | fabF                | beta-ketoacyl-acyl-carrier-protein synthase II                             |
| S19-40_00220                          | -                   | 8-amino-7-oxononanoate synthase/2-amino-3-ketobutyrate coenzyme A ligase   |
| S19-40_00407                          | apbA                | Ketopantoate reductase PanE/ApbA   |
| S19-40_00460                          | dxs                 | Transketolase, pyrimidine binding domain                                   |
| S19-40_00476                          | : 2-dehydropantoate | Ketopantoate reductase PanE/ApbA   |
| S19-40_00565                          | mtnX                | 2-hydroxy-3-keto-5-methylthiopentenyl-1-phosphate phosphatase              |
| S19-40_00566                          | mtnW                | 2,3-diketo-5-methylthiopentenyl-1-phosphate enolase                        |
| S19-40_00966                          | ghrB                | glyoxylate/hydroxypyruvate/2-ketogluconate reductase                       |
| S19-40_01097                          | -                   | Aldo/keto reductase family protein   |
| S19-40_01158                          | fadA                | 3-ketoacyl-CoA thiolase  |
| S19-40_01396                          | -                   | Aldo/keto reductase family protein   |
| S19-40_01493                          | csbX                | Alpha-ketoglutarate permease   |
| S19-40_01547                          | ilvC                | Ketol-acid reductoisomerase (NADP(+))                                      |
| S19-40_01623                          | -                   | Aldo/keto reductase family protein   |
| S19-40_01653                          | camP                | 2,5-diketocamphane 1,2-monoxygenase  |
| S19-40_01995                          | ydaE                | putative D-lyxose ketol-isomerase  |
| S19-40_02000                          | -                   | Aldo/keto reductase family protein   |
| S19-40_02005                          | pcaR_pcaU           | beta-ketoadipate pathway transcriptional regulators, PcaR/PcaU/PobR family |
| S19-40_02073                          | ulaD                | 3-keto-L-gulonate-6-phosphate decarboxylase UlaD                           |
| S19-40_02145                          | -                   | Aldo/keto reductase family protein   |
| S19-40_02175                          | xylA                | alpha-ketoglutaric semialdehyde dehydrogenase                              |
| S19-40_02310                          | dlgD                | 2,3-diketo-L-gulonate reductase  |
| S19-40_02418                          | fabF                | fabF: beta-ketoacyl-acyl-carrier-protein synthase II                       |
| S19-40_02521                          | fadA                | 3-ketoacyl-CoA thiolase  |
| S19-40_02597                          | -                   | Aldo/keto reductase family protein   |
| S19-40_02838                          | -                   | Aldo/keto reductase family protein   |
| S19-40_02882                          | -                   | Transketolase, pyrimidine binding domain                                   |
| S19-40_02895                          | fadA                | 3-ketoacyl-CoA thiolase  |
| S19-40_03297                          | dxs                 | Transketolase, pyrimidine binding domain                                   |
| S19-40_03393                          | scoA                | putative succinyl-CoA:3-ketoacid coenzyme A transferase subunit A          |
| S19-40_03394                          | scoB                | putative succinyl-CoA:3-ketoacid coenzyme A transferase subunit B          |
| S19-40_03621                          | scoB                | putative succinyl-CoA:3-ketoacid coenzyme A transferase subunit B          |
| S19-40_03674                          | kdgT                | 2-keto-3-deoxygluconate permease   |
| S19-40_03678                          | kduI                | 4-deoxy-L-threo-5-hexosulose-uronate ketol-isomerase                       |
| S19-40_03822                          | -                   | Aldo/keto reductase family protein   |
| S19-40_03832                          | ioII                | 2-keto-myo-inositol isomerase  |

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*Dehydratase related genes*

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|              |       |   |
|--------------|-------|---|
| S19-40_00109 | leuC  | 3-isopropylmalate dehydratase large subunit           |
| S19-40_00332 | sdhA  | L-serine dehydratase, alpha chain                     |
| S19-40_00333 | sdhB  | L-serine dehydratase, beta chain                      |
| S19-40_00564 | mtnB  | Methylthioribulose-1-phosphate dehydratase            |
| S19-40_00785 | fabZ  | 3-hydroxyacyl-[acyl-carrier-protein] dehydratase FabZ |
| S19-40_00942 | hisB  | Imidazoleglycerol-phosphate dehydratase               |
| S19-40_01000 | pglF  | UDP-N-acetyl-alpha-D-glucosamine C6 dehydratase       |
| S19-40_01470 | tcdA  | tRNA threonylcarbamoyladenine dehydratase             |
| S19-40_01507 | -     | Prephenate dehydratase                                |
| S19-40_01531 | hemB  | Delta-aminolevulinic acid dehydratase                 |
| S19-40_01543 | leuD1 | 3-isopropylmalate dehydratase small subunit 1         |
| S19-40_01544 | leuC  | 3-isopropylmalate dehydratase large subunit           |
| S19-40_01736 | -     | NAD dependent epimerase/dehydratase family protein    |
| S19-40_01805 | -     | NAD dependent epimerase/dehydratase                   |
| S19-40_02013 | fabZ  | 3-hydroxyacyl-[acyl-carrier-protein] dehydratase FabZ |
| S19-40_02171 | garD  | Galactarate dehydratase (L-threo-forming)             |
| S19-40_02173 | gudD  | Glucarate dehydratase                                 |
| S19-40_02176 | -     | putative 5-dehydro-4-deoxyglucarate dehydratase       |
| S19-40_02303 | uxaA  | Altronate dehydratase                                 |
| S19-40_02308 | uxuA  | Mannonate dehydratase                                 |
| S19-40_02782 | aroD  | 3-dehydroquinate dehydratase                          |
| S19-40_02853 | dsdA  | D-serine dehydratase                                  |
| S19-40_02891 | prpD  | 2-methylcitrate dehydratase                           |
| S19-40_02926 | yqhS  | 3-dehydroquinate dehydratase                          |
| S19-40_03226 | rfbG  | CDP-glucose 4,6-dehydratase                           |
| S19-40_03334 | -     | NAD dependent epimerase/dehydratase family protein    |
| S19-40_03405 | -     | GDP-mannose 4,6 dehydratase                           |
| S19-40_03419 | nnrD  | ADP-dependent (S)-NAD(P)H-hydrate dehydratase         |
| S19-40_03512 | rfbB  | dTDP-glucose 4,6-dehydratase                          |
| S19-40_03631 | pseB  | UDP-N-acetylglucosamine 4,6-dehydratase (inverting)   |
| S19-40_03641 | ilvA  | L-threonine dehydratase biosynthetic IlvA             |
| S19-40_03651 | ilvD  | Dihydroxy-acid dehydratase                            |
| S19-40_03828 | iolE  | Inosose dehydratase                                   |
| S19-40_03831 | iolE  | Inosose dehydratase                                   |

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*Enoyl reductase related genes*

|              |      |   |
|--------------|------|---|
| S19-40_00232 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_00327 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_00514 | fadH | putative 2,4-dienoyl-CoA reductase                  |
| S19-40_00548 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_01324 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_01390 | -    | putative enoyl-[acyl-carrier-protein] reductase II  |
| S19-40_01662 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_01996 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_02024 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_02139 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_02346 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_02378 | fabI | Enoyl-[acyl-carrier-protein] reductase [NADH] FabI  |
| S19-40_02513 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_02516 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_02605 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_02899 | fadH | 2,4-dienoyl-CoA reductase (NADPH2)                  |
| S19-40_03349 | fabL | Enoyl-[acyl-carrier-protein] reductase [NADPH] FabL |
| S19-40_03372 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_03395 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_03523 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_03527 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_03679 | -    | Enoyl-(Acyl carrier protein) reductase              |
| S19-40_03816 | -    | Enoyl-(Acyl carrier protein) reductase              |

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*Other acetyltransferase related genes*

|              |           |   |
|--------------|-----------|---|
| S19-40_00053 | ydaF      | Putative ribosomal N-acetyltransferase YdaF   |
| S19-40_00166 | speG      | Spermidine N(1)-acetyltransferase   |
| S19-40_00220 | kbl, GCAT | glycine C-acetyltransferase   |
| S19-40_00408 | ylbP      | putative N-acetyltransferase YlbP   |
| S19-40_00459 | pdhC      | Dihydrolipoyllysine-residue acetyltransferase component of pyruvate dehydrogenase complex |
| S19-40_00502 | dapH      | 2,3,4,5-tetrahydropyridine-2,6-dicarboxylate N-acetyltransferase                          |
| S19-40_00527 | -         | Acetyltransferase (GNAT) family protein   |

|              |       |   |
|--------------|-------|---|
| S19-40_00621 | -     | Acetyltransferase (GNAT) domain protein   |
| S19-40_00725 | argA  | amino-acid N-acetyltransferase  |
| S19-40_00765 | ywnH  | Putative phosphinothricin acetyltransferase YwnH  |
| S19-40_00936 | dapH  | 2,3,4,5-tetrahydropyridine-2,6-dicarboxylate N-acetyltransferase                          |
| S19-40_00960 | nat   | Arylamine N-acetyltransferase   |
| S19-40_01010 | epsM  | Putative acetyltransferase EpsM   |
| S19-40_01045 | yvbK  | putative N-acetyltransferase YvbK   |
| S19-40_01228 | paiA  | Spermidine/spermine N(1)-acetyltransferase  |
| S19-40_01347 | -     | Acetyltransferase (GNAT) family protein   |
| S19-40_01371 | bltD  | Spermine/spermidine acetyltransferase   |
| S19-40_01402 | mdpB3 | acetyltransferase/esterase  |
| S19-40_01427 | oatA  | O-acetyltransferase OatA  |
| S19-40_01551 | ysnE  | putative N-acetyltransferase YsnE   |
| S19-40_01659 | ytmI  | putative N-acetyltransferase YtmI   |
| S19-40_01771 | cysE  | Serine acetyltransferase  |
| S19-40_01853 | ypeA  | Acetyltransferase YpeA  |
| S19-40_01870 | yycN  | putative N-acetyltransferase YycN   |
| S19-40_01898 | -     | GNAT acetyltransferase  |
| S19-40_01930 | ydaF  | Putative ribosomal N-acetyltransferase YdaF   |
| S19-40_01994 | ydaF  | Putative ribosomal N-acetyltransferase YdaF   |
| S19-40_02207 | slyA  | rimI: ribosomal-protein-alanine acetyltransferase   |
| S19-40_02340 | -     | Acetyltransferase (GNAT) domain protein   |
| S19-40_02357 | ydaF  | Putative ribosomal N-acetyltransferase YdaF   |
| S19-40_02365 | yjcF  | putative N-acetyltransferase YjcF   |
| S19-40_02403 | yjbC  | Putative acetyltransferase YjbC   |
| S19-40_02431 | argA  | Amino-acid acetyltransferase  |
| S19-40_02432 | argJ  | ArgJ: glutamate N-acetyltransferase/amino-acid acetyltransferase                          |
| S19-40_02456 | -     | Acetyltransferase (GNAT) domain protein   |
| S19-40_02457 | -     | Acetyltransferase (GNAT) domain protein   |
| S19-40_02521 | yhfS  | Putative acetyl-CoA C-acetyltransferase YhfS  |
| S19-40_02525 | wecD  | dTDP-fucosamine acetyltransferase   |
| S19-40_02601 | phnO  | Aminoalkylphosphonate N-acetyltransferase   |
| S19-40_02798 | -     | rimI: ribosomal-protein-alanine acetyltransferase   |
| S19-40_02843 | mshD  | Mycothioli acetyltransferase  |
| S19-40_02845 | -     | ectoine_EctA: diaminobutyrate acetyltransferase   |
| S19-40_02881 | pdhC  | Dihydrolipoyllysine-residue acetyltransferase component of pyruvate dehydrogenase complex |
| S19-40_02887 | pta   | Phosphate acetyltransferase   |
| S19-40_02895 | mmgA  | Acetyl-CoA acetyltransferase  |
| S19-40_03092 | rimI  | Ribosomal-protein-alanine acetyltransferase   |
| S19-40_03191 | -     | Acetyltransferase (GNAT) family protein   |
| S19-40_03241 | -     | Acetyltransferase (GNAT) family protein   |
| S19-40_03298 | pdhC  | Dihydrolipoyllysine-residue acetyltransferase component of pyruvate dehydrogenase complex |
| S19-40_03441 | patA  | Peptidoglycan O-acetyltransferase   |
| S19-40_03507 | wecD  | dTDP-fucosamine acetyltransferase   |
| S19-40_03529 | pta   | Phosphate acetyltransferase   |
| S19-40_03548 | rimL  | rimI: ribosomal-protein-alanine acetyltransferase   |
| S19-40_03619 | yodP  | N-acetyltransferase YodP  |
| S19-40_03625 | rimL  | rimI: ribosomal-protein-alanine acetyltransferase   |
| S19-40_03695 | yycN  | putative N-acetyltransferase YycN   |
| S19-40_03740 | yjcF  | putative N-acetyltransferase YjcF   |
| S19-40_03744 | -     | Acetyltransferase   |
| S19-40_03746 | wecD  | dTDP-fucosamine acetyltransferase   |
| S19-40_03758 | maa   | Maltose O-acetyltransferase   |
| S19-40_03848 | ytmI  | putative N-acetyltransferase YtmI   |
| S19-40_03930 | cysE  | Serine acetyltransferase  |
| S19-40_03976 | glmU  | glmU: UDP-N-acetylglucosamine diphosphorylase/glucosamine-1-phosphate N-acetyltransferase |