**Table S5. Genes of acyl lipid metabolism, simultaneously regulated in flowers of *FAX1* knockouts and over-expressors.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **ko\_flower** | | | **ox\_flower** | | | |  |  |  |
| **AGI** | **Mu**  **signal** | **Wt signal** | **FCH** | **Mu signal** | **Wt signal** | **FCH** | **Pathway** | | **Protein Family Name** | **Gene Name** | |

**strongest change in ko\_flower**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| At5g47350 | 108.18 | 1671.07 | **0.06** | 365.09 | 1535.93 | **0.24** | Pathway. function or subcellular location uncertain | Thioesterase (PPT1-like) |  |
| At5g08030 | 27.28 | 195.03 | **0.14** | 64.64 | 199.11 | **0.32** | Pathway. function or subcellular location uncertain | Glycerophosphoryl Diester Phosphodiesterase |  |
| At5g09370 | 70.32 | 422.77 | **0.17** | 112.22 | 300.67 | **0.37** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 5) |
| At5g39400 | 203.49 | 1063.88 | **0.19** | nr | nr | nr | Phospholipid Signaling | Phosphoinositide 3-Phosphatase | PTEN1 |

**strongest change in ox\_flower**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Atcg00500 | nr | nr | nr | 1044.61 | 235.58 | **4.43** | Fatty Acid Synthesis | Carboxyltransferase ß-subunit of heteromeric ACCase | ß-CT |
| At5g47350 | 108.18 | 1671.07 | **0.06** | 365.09 | 1535.93 | **0.24** | Pathway. function or subcellular location uncertain | Thioesterase (PPT1-like) |  |
| At5g07560 | 932.65 | 2752.69 | **0.34** | 599.94 | 2131.36 | **0.28** | Triacylglycerol Biosynthesis | Pollen-surface Oleosin |  |
| At4g08670 | 295.76 | 1299.75 | **0.23** | 334.03 | 1134.62 | **0.29** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 5) |

**reciprocal regulation**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| At4g34250 | 120.27 | 90.25 | **1.33** | 65.60 | 81.81 | **0.80** | Fatty Acid Elongation & Wax Biosynthesis | Ketoacyl-CoA Synthase | KCS16 |

**up-regulated**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| At1g64670 | 914.35 | 721.61 | **1.27** | 850.01 | 666.68 | **1.27** | Cutin/Suberin Synthesis & Transport 1 | Hydrolase-like Protein | BDG | |
| At5g22420 | 107.93 | 54.31 | **1.99** | 69.63 | 48.41 | **1.44** | Fatty Acid Elongation & Wax Biosynthesis | Alcohol-forming Fatty Acyl-CoA Reductase | BDG | |
| At5g60340 | 67.90 | 48.27 | **1.41** | 48.76 | 39.11 | **1.25** | Mitochondrial Fatty Acid & Lipoic Acid Synthesis | Hydroxyacyl-ACP Dehydrase | AlcFAR7 | |
| At3g16170 | 579.43 | 492.07 | **1.18** | 484.99 | 362.82 | **1.34** | Mitochondrial Fatty Acid & Lipoic Acid Synthesis | Malonyl-CoA Synthase | HAD |
| At4g37050 | 288.29 | 206.71 | **1.39** | 195.49 | 148.51 | **1.32** | Oxylipin Metabolism 1 | Acyl-Hydrolase (Patatin-like) | MCS/AAE13 | |
| At3g25760 | 261.04 | 78.81 | **3.31** | 130.61 | 70.76 | **1.85** | Oxylipin Metabolism 1; Oxylipin Metabolism 2 | Allene Oxide Cyclase |  | |
| At3g14205 | 736.85 | 557.03 | **1.32** | 676.40 | 477.02 | **1.42** | Phospholipid Signaling | Sac domain-containing Phosphoinositide Phosphatase |  | |
| At3g25610 | 107.90 | 84.97 | **1.27** | 87.56 | 68.75 | **1.27** | Pathway. function or subcellular location uncertain | Translocase |  | |

**down-regulated**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| At3g03540 | 69.08 | 131.34 | **0.53** | 39.48 | 83.83 | **0.47** | Eukaryotic Galactolipid & Sulfolipid Synthesis | Phospholipase C (Non specific) | NPC5 |
| At4g11030 | 40.22 | 108.55 | **0.37** | 33.61 | 83.40 | **0.40** | Eukaryotic Phospholipid Synthesis & Editing | Long-Chain Acyl-CoA Synthetase | LACS5 |
| At4g38570 | 510.52 | 651.04 | **0.78** | 516.78 | 619.08 | **0.83** | Eukaryotic Phospholipid Synthesis & Editing | Phosphatidylinositol Synthase | PIS2 |
| At1g80460 | 1080.22 | 1314.99 | **0.82** | 884.00 | 1041.08 | **0.85** | Eukaryotic Phospholipid Synthesis & Editing | Glycerol Kinase | GLI1 |
| At5g52160 | 278.56 | 1127.84 | **0.25** | 523.65 | 991.45 | **0.53** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 3) |
| At5g62080 | 788.92 | 2647.72 | **0.30** | 1307.80 | 2558.93 | **0.51** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 3) |
| At1g18280 | 430.65 | 1439.97 | **0.30** | 449.74 | 1202.10 | **0.37** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 5) |
| At1g73560 | 36.28 | 87.21 | **0.42** | 34.53 | 71.10 | **0.49** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 5) |
| At1g36150 | 97.26 | 182.37 | **0.53** | 87.96 | 181.84 | **0.48** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 5) |
| At3g07450 | 306.29 | 885.32 | **0.35** | 415.54 | 760.26 | **0.55** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 3) |
| At2g27130 | 469.18 | 640.99 | **0.73** | 412.78 | 508.77 | **0.81** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 5) |
| At3g52130 | 291.25 | 747.65 | **0.39** | 298.68 | 684.40 | **0.44** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 3) |
| At1g66850 | 5938.48 | 12365.67 | **0.48** | 7454.70 | 11837.91 | **0.63** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 2) |
| At5g01870 | 455.46 | 1153.39 | **0.39** | 707.68 | 1034.84 | **0.68** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | (LTP type 1) |
| At4g28395 | 930.39 | 2071.49 | **0.45** | 797.62 | 1596.73 | **0.50** | Fatty Acid Elongation & Wax Biosynthesis | Lipid Transfer Protein | ATA7 / (LTP type 8) |
| At3g52160 | 232.68 | 560.47 | **0.42** | 334.15 | 609.23 | **0.55** | Fatty Acid Elongation & Wax Biosynthesis | Ketoacyl-CoA Synthase | KCS15 |
| At3g23840 | 325.40 | 690.38 | **0.47** | 307.89 | 635.87 | **0.48** | Fatty Acid Elongation & Wax Biosynthesis | CER2-like Protein |  |
| At5g55320 | 60.29 | 93.57 | **0.64** | 42.86 | 60.76 | **0.71** | Fatty Acid Elongation & Wax Biosynthesis | Wax Synthase |  |
| At3g55100 | 75.63 | 132.80 | **0.57** | 65.80 | 104.59 | **0.63** | Fatty Acid Elongation & Wax Biosynthesis | ABC Transporter | WBC17 / ABCG17 |
| At5g13580 | 216.49 | 328.27 | **0.66** | 180.98 | 319.00 | **0.57** | Fatty Acid Elongation & Wax Biosynthesis  Suberin Synthesis & Transport 3 | ABC Transporter | WBC6 / ABCG6 |
| At1g06250 | 94.15 | 169.68 | **0.55** | 58.37 | 119.71 | **0.49** | Oxylipin Metabolism 1; Oxylipin Metabolism 2 | Acylhydrolase (DAD1-like) |  |
| At1g02660 | 363.58 | 608.05 | **0.60** | 327.83 | 537.41 | **0.61** | Oxylipin Metabolism 1; Oxylipin Metabolism 2 | Lipid Acylhydrolase-like |  |
| At1g73680 | 358.05 | 536.74 | **0.67** | 341.67 | 472.36 | **0.72** | Oxylipin Metabolism 2 | α-Dioxygenase-Peroxidase (involved in fatty acid α-oxidation) |  |
| At1g52570 | 184.75 | 459.16 | **0.40** | 193.80 | 409.75 | **0.47** | Phospholipid Signaling | Phospholipase D alpha |  |
| At5g57690 | 89.17 | 209.42 | **0.43** | 116.19 | 196.25 | **0.59** | Phospholipid Signaling | Diacylglycerol Kinase |  |
| At5g66020 | 77.14 | 176.60 | **0.44** | 72.11 | 136.52 | **0.53** | Phospholipid Signaling | Sac domain-containing Phosphoinositide Phosphatase |  |
| At2g41210 | 117.75 | 246.79 | **0.48** | 122.98 | 210.16 | **0.59** | Phospholipid Signaling | Phosphatidylinositol-Phosphate Kinase type IB |  |
| At1g64460 | 197.63 | 280.05 | **0.71** | 204.76 | 261.34 | **0.78** | Phospholipid Signaling | Phosphatidylinositol-4-Kinase gamma |  |
| At4g26770 | 36.89 | 69.09 | **0.53** | 32.71 | 55.36 | **0.59** | Pro. Galactolipid. Sulfolipid. & Phospholipid Synt. 1  Mitochondrial Phospholipid Synthesis | CDP-DAG Synthase | CDS3/CDP-DAGS |
| At5g20410 | 397.05 | 1332.82 | **0.30** | 725.29 | 1198.33 | **0.61** | Pro. Galactolipid. Sulfolipid. & Phospholipid Synt. 2  Euk. Galactolipid & Sulfolipid Synthesis | Monogalactosyldiacylglycerol Synthase | MGD2 |
| At2g46210 | 610.48 | 2569.78 | **0.24** | 1121.18 | 1757.65 | **0.64** | Sphingolipid Biosynthesis 1 | Sphingobase-D8 Desaturase | SLD2 |
| At4g04930 | 408.06 | 1594.41 | **0.26** | 829.95 | 1546.09 | **0.54** | Sphingolipid Biosynthesis 1 | Dihydrosphingosine Delta-4 Desaturase | DSD1 |
| At4g20870 | 1226.84 | 1718.98 | **0.71** | 1140.14 | 1510.77 | **0.75** | Sphingolipid Biosynthesis 1 | Fatty Acid 2-hydroxylase | FAH2 |
| At4g39670 | 323.13 | 1051.85 | **0.31** | 347.75 | 757.58 | **0.46** | Sphingolipid Biosynthesis 1;2 | Sphingosine Transfer Protein |  |
| At3g11430 | 864.62 | 1351.18 | **0.64** | 672.96 | 1034.10 | **0.65** | Suberin Synthesis & Transport 1 | Glycerol-3-Phosphate Acyltransferase | sn-2-GPAT5 |
| At3g55180 | 76.91 | 223.87 | **0.34** | 102.62 | 203.30 | **0.50** | Triacylglycerol & Fatty Acid Degradation | Monoacylglycerol Lipase (MAGL) |  |
| At3g55190 | 22.62 | 60.42 | **0.37** | 27.82 | 60.86 | **0.46** | Triacylglycerol & Fatty Acid Degradation | Monoacylglycerol Lipase (MAGL) | SDP1-LIKE |
| At3g57140 | 38.58 | 113.73 | **0.34** | 65.69 | 102.84 | **0.64** | Triacylglycerol & Fatty Acid Degradation;  Oxylipin Metabolism 1 | Triacylglycerol Lipase (TAGL) |  |
| At2g25890 | 72.45 | 262.81 | **0.28** | 85.72 | 274.66 | **0.31** | Triacylglycerol Biosynthesis | Oil-Body Oleosin |  |
| At3g18570 | 87.99 | 178.18 | **0.49** | 88.54 | 171.48 | **0.52** | Triacylglycerol Biosynthesis | Oil-Body Oleosin |  |
| At5g07510 | 316.55 | 767.51 | **0.41** | 290.08 | 536.44 | **0.54** | Triacylglycerol Biosynthesis | Pollen-surface Oleosin |  |
| At5g07540 | 602.11 | 1219.27 | **0.49** | 345.23 | 1107.87 | **0.31** | Triacylglycerol Biosynthesis | Pollen-surface Oleosin |  |
| At5g07530 | 4443.58 | 8718.73 | **0.51** | 3976.09 | 7545.64 | **0.53** | Triacylglycerol Biosynthesis | Pollen-surface Oleosin |  |
| At5g07520 | 245.72 | 481.52 | **0.51** | 185.68 | 426.34 | **0.44** | Triacylglycerol Biosynthesis | Pollen-surface Oleosin |  |
| At5g07550 | 6545.73 | 11367.27 | **0.58** | 4824.89 | 9493.73 | **0.51** | Triacylglycerol Biosynthesis | Pollen-surface Oleosin |  |
| At1g23250 | 101.47 | 165.98 | **0.61** | 102.77 | 148.73 | **0.69** | Triacylglycerol Biosynthesis | Caleosin |  |
| At3g15820 | 1187.12 | 1646.36 | **0.72** | 1150.52 | 1353.21 | **0.85** | Triacylglycerol Biosynthesis | Phosphatidylcholine:diacylglycerol cholinephosphotransferase | PDCT/ROD1 |
| At1g51260 | 52.91 | 133.89 | **0.40** | 89.20 | 150.17 | **0.59** | Triacylglycerol Biosynthesis  Euk. Phospholipid Synthesis & Editing | 1-Acylglycerol-3-Phosphate Acyltransferase | LPAAT3 |
| At4g17480 | 405.96 | 593.73 | **0.68** | 374.30 | 530.74 | **0.71** | Pathway. function or subcellular location uncertain | Thioesterase (PPT1-like) |  |
| At1g54280 | 58.83 | 181.00 | **0.33** | 96.73 | 170.75 | **0.57** | Pathway. function or subcellular location uncertain | Translocase |  |