Table S1: Genes encoding the proteins for suberin biosynthesis and CS formation in Arabidopsis and their orthologs in rice.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Biological  process | Related genes in *Arabidopsis* | Description | Ref | Orthologous genes in rice | Gene description in rice | Ref |
| For Casparian strip | Myb36 (AT5G57620) | Myb transcription factor 36 | (1) | Os08g0248700  Os02g0786400  Os03g0771100 | Myb transcription factor 36a, 36b, and 36c | (2) |
|  | CASP1 (AT2G36100)  /CASP2 (AT3G11550) /CASP3 (AT2G27370)  /CASP4 (AT5G06200) | Casparian strip membrane domain proteins | (3) | Os04g0684300  /Os08g0101900 | Casparian strip membrane domain protein |  |
|  | CASP5 (AT5G15290) | Casparian strip membrane domain protein 5 | (3) | Os06g0231050/ Os02g0743900/  Os04g0460400 | Casparian strip membrane domain protein |  |
|  | Rbohf (AT1g64060) | Respiratory burst oxidase homolog f | (4) | Os05t0528000/  Os01t0734200 | OsRBOH5/OsRbohA/OsNOX2 |  |
|  | Per64 (AT5G42180) | Peroxidase required for Casparian strip lignification | (4) | Os02t0833900 | Prx32 |  |
|  | SGN1 (AT1G61590) | Protein kinase | (5) | Os03t0364400 | BBS1 |  |
|  | SGN3 (AT4G20140) | A putative leucine-rich repeat transmembrane- receptor kinase | (6) | Os07t0498400 | A putative leucine-rich repeat transmembrane- receptor kinase |  |
|  | ESB1 (AT2G28670) | ENHANCED SUBERIN 1, Dirigent-like protein | (7) | Os03g0280750; Os01g0155300 | A dirigent-like protein |  |
|  | LOTR1 (AT5G50150) | LORD OF THE RINGS 1, A putative extracellular protease | (8) | Os06g0474500 | A putative extracellular protease |  |
|  | ABCG29 (AT3G16340) | ATP-binding cassette subfamily G transporter 29 | (9) | Os01g0609300 | ATP-binding cassette subfamily G transporter |  |
|  | CIF1 (AT2G16385) | CIF1 is a peptide hormone expressed in the root stele | (10) | Os11g0323860 | CASPARIAN STRIP INTEGRITY FACTOR 1 |  |
|  | CIF2 (AT4G34600) | CIF2 is a peptide hormone expressed in the root stele | (10) | Os11g0323860 | CASPARIAN STRIP INTEGRITY FACTOR 1 |  |
|  |  |  |  |  |  |  |
| **Suberin biosynthesis** | KCS2 (AT1G04220) | β-ketoacyl-CoA synthase 2 | (11) | Os05g0574600  (OsFAE1) | Similar to 3-ketoacyl-CoA synthase. |  |
|  | KCS20 (AT5G43760) | β-ketoacyl-CoA synthase 20 | (11) | Os06g0598800  (WSL1) | β-ketoacyl CoA synthase, Biosynthesis of cuticular waxes on rice leaf |  |
|  | KCS6 (AT1G68530) | β-ketoacyl-CoA synthase 6  (Ortholog of StKCS6 (ACF17125)) | (12) | Os03g0220100 (KCS6/WSL4/CER6) | Very-long-chain fatty acid (VLCFA) elongation | (13) |
|  | FAR1 (AT5G22500) | Fatty acyl-CoA reductase | (14) | Os08g0298700  / Os09g0567500 | A putative fatty acyl CoA reductase |  |
|  | FAR4 (AT3G44540) | Fatty acyl-CoA reductase | (14) | Os08g0298700  / Os09g0567500 | A putative fatty acyl CoA reductase |  |
|  | FAR5 (AT3G44550) | Fatty acyl-CoA reductase | (14) | Os08g0298700 | A putative fatty acyl CoA reductase |  |
|  | CYP86B1/RALPH  (AT5G23190) | Cytochrome P450-dependent fatty acidω-hydroxylase | (15) | Os10g0486100  (CYP86B1) | Cytochrome P450-like protein |  |
|  | CYP86A1/HORST  (AT5G58860) | Cytochrome P450-dependent fatty acidω-hydroxylase | (16) | Os01g0854800  (CYP86A7-2) | Similar to Cytochrome P450 86A1, P450-dependent fatty acid omega-hydroxylase |  |
|  | GPAT5(AT3G11430) | Glycerol-3-phosphate acyltransferase | (17) | Os05g0457800 (OsGPAT) | Similar to Glycerol-3-phosphate acyltransferase 5 |  |
|  | ASFT(AT5G41040) | Feruloyl transferase/ω-hydroxy acid  hydroxycinnamoyl transferase | (18) | Os11g0507200 | Similar to transferase. |  |
| **Secretion** | ABCG1(AT2G39350) | ABCG Transporters are required for Suberin | (19) | Os03g0281900  (OsABCG5/RCN1) | ATP-binding cassette (ABC) transporter, Hypodermal suberization of roots, Salt stress tolerance | (20) |
|  | ABCG2(AT2G37360) | ATP-binding cassette subfamily G transporter 2 | (19) | Os03g0281900  (OsABCG5/RCN1) | ATP-binding cassette (ABC) transporter, Hypodermal suberization of roots, Salt stress tolerance | (20) |
|  | ABCG6(AT5G13580) | ATP-binding cassette subfamily G transporter 6 | (19) | Os03g0281900  (OsABCG5/RCN1) | ATP-binding cassette (ABC) transporter, Hypodermal suberization of roots, Salt stress tolerance | (20) |
|  | ABCG20(AT4G28110) | ATP-binding cassette subfamily G transporter 20 | (19) | Os03g0281900  (OsABCG5/RCN1) | ATP-binding cassette (ABC) transporter, Hypodermal suberization of roots, Salt stress tolerance | (20) |
| **Regulation** | Myb39(AT4G17785) | Myb transcription factor 39 | (21) | Os06g0112700  (OsDLN156) | Similar to Typical P-type R2R3 Myb protein, DLN motif protein 156 |  |
|  | Myb41(AT4G28110) | Myb transcription factor 41 | (22) (23) | Os07g0558100 | Similar to Myb-related transcription factor LBM1, transcription factor MYB7 |  |
|  | Myb53 (AT5G65230) | Myb transcription factor 53 | (23) | Os06g0221000/  Os08g0486300 | Similar to P-type R2R3 Myb protein |  |
|  | Myb92 (AT5G10280) | Myb transcription factor 92 | (23) | Os06g0221000/  Os08g0486300 | Similar to P-type R2R3 Myb protein |  |
|  | Myb93 (AT1G34670) | Myb transcription factor 93 | (23) | Os06g0221000/  Os08g0486300 | Similar to P-type R2R3 Myb protein |  |

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