**Table S10** Summary in secondary metabolism of LAC

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| **Gene name** | **Organism** | **Expression pattern** | **Putative function** | **References** |
| *AtLAC4* | *A. thaliana* | high expression in stems | lignin biosynthesis | Berthet et al., 2011; Zhao et al., 2013 |
| *AtLAC10* | *A. thaliana* | high expression in stems | lignin biosynthesis |  |
| *AtLAC11* | *A. thaliana* | high expression in stems | lignin biosynthesis | Zhao et al., 2013 |
| *AtLAC15* | *A. thaliana* | high expression in seeds | flavonoids | Cai et al., 2006 |
| *AtLAC17* | *A. thaliana* | high expression in stems | lignin biosynthesis | Berthet et al., 2011; Zhao et al., 2013 |
| *PtLAC1* | *P. trichocarpa* | high expression in stems | lignin biosynthesis | Lu et al., 2013 |
| *PtLAC2* | *P. trichocarpa* | high expression in xylems | lignin biosynthesis | Lu et al., 2013 |
| *PtLAC14* | *P. trichocarpa* | high expression in xylems | lignin biosynthesis | Lu et al., 2013 |
| *PtLAC15* | *P. trichocarpa* | high expression in xylems | lignin biosynthesis | Lu et al., 2013 |
| *PtLAC20* | *P. trichocarpa* | high expression in xylems | lignin biosynthesis | Lu et al., 2013 |
| *PtLAC23* | *P. trichocarpa* | high expression in xylems | lignin biosynthesis | Lu et al., 2013 |
| *PtLAC24* | *P. trichocarpa* | high expression in xylems | lignin biosynthesis | Lu et al., 2013 |
| *PtLAC40* | *P. trichocarpa* | high expression in xylems | lignin biosynthesis | Lu et al., 2013 |
| *PtLAC41* | *P. trichocarpa* | high expression in stems | lignin biosynthesis | Lu et al., 2013 |
| *PtLAC49* | *P. trichocarpa* | high expression in xylems | lignin biosynthesis | Lu et al., 2013 |
| *PbLAC1* | *P. bretschneideri* | high expression in stems and fruits | lignin biosynthesis | Chen et al., 2019 |
| *PbLAC6* | *P. bretschneideri* | high expression in fruits | lignin biosynthesis | Chen et al., 2019 |
| *PbLAC29* | *P. bretschneideri* | high expression in fruits | lignin biosynthesis | Chen et al., 2019 |
| *PbLAC36* | *P. bretschneideri* | high expression in fruits | lignin biosynthesis | Chen et al., 2019 |
| BdLAC5 | *B. distachyon* | high expression in  stems | lignin biosynthesis | Wang et al., 2015 |
| SofLAC | *Saccharum* spp | high expression in stems | lignin biosynthesis | Cesarino et al., 2013 |
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