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Soybean (*Glycine max*) wrinkled1 transcription factor, *GmWRI1a*, positively regulates seed oil accumulation

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Currently WRINKLED1 (WRI1) encodes a transcription factor of the APETALA2/ethylene responsive element-binding protein (AP2/EREBP) family that plays important roles during plant seed oil accumulation. In this study, we isolated and characterized three distinct orthologues of *WRI1* in soybean (*Glycine max*), among which *GmWRI1a* is highly expressed in maturing seeds, whilst *GmWRI1b* and *GmWRI1c* are preferentially expressed in stems and flowers, respectively. Electrophoretic mobility-shift assays and yeast one-hybrid experiments demonstrated that the GmWRI1a protein is capable of binding to the AW-box, a conserved sequence present in the proximal upstream regions of many genes involved in various steps of oil biosynthesis in plastids. Overexpression of *GmWRI1a* under the control of cauliflower mosaic virus 35S-promoter exhibited enhanced oil content of the mature soybean seed. Furthermore, quantitative RT-PCR experiments demonstrated that several genes related to late glycolysis and fatty acid biosynthesis were increased dramatically in the *GmWRI1a*-overexpressing soybean plants. Taken together, these results indicate that *GmWRI1a* as a transcription factor positively regulates seed oil accumulation through the activation of some genes related to fatty acid biosynthesis.