Lignin has significant commercial value and modified-lignin transgenics can provide improved raw materials for pulp and paper industry and agricultural uses. Downregulation of cinnamate-4-hydroxylase (C4H) from *Medicago sativa* in tobacco resulted in significant reduction in lignin content with apparent decreases in their S (syringyl)/G (guaiacyl) ratio (Sewalt et al., 1997). Antisense of caffeoyl-coenzyme A O-methyltransferase (CCoAOMT) was transformed to *Populus tremula* × *Populus alba* plants, and the results showed reduction of 68% in CCoAOMT activity and 45% in lignin content, relative to the controls (Zhong et al., 2000). Most of the lignin downregulation studies use sense or antisense constructs which usually result in only a modest proportion of silenced individuals. Recent studies have demonstrated the use of constructs encoding self-complementary ‘hairpin’ RNA (hpRNA) to efficiently silence genes (Wesley et al., 2001). In this study, downregulation of lignin genes is attempted using both antisense and intron-spliced hpRNA constructs.

**Materials and Methods**

**Plasmid Construction**

1. In vitro DNA cloning
   - Digestion with restriction enzymes
   - Ligation of DNA fragments
   - Transformation into competent cells

**Transformation**

1. Agrobacterium-mediated transformation
   - Introduction of foreign genes into plant cells

**Plant Transformation**

1. Selection and culture of transformed plants
2. Characterization of transgenic plants

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