

*falcatum*, *Cnidium officinale* or *Glehnia littoralis*. A sequence of 300 bp amplified from the conserved sequences of the 5s rRNA gene was used to confirm the origin of *Angelica acutiloba*. This sequence is identical within the species and among the wild varieties but varies substantially with other medicinal species belonging to Umbelliferae (Mizukami, 1995). The spacer sequence of 5s rDNA has also been used to authenticate *Fritillaria* (Cai *et al.*, 1999) and *Astragalus* (Ma *et al.*, 2000); 18s rDNA for verifying several ginseng drugs (Fushimi *et al.*, 1996); *rbcL* for discriminating between 'banxia' and 'tiananxing' as well as 'banxia' related natural medicines (Kondo *et al.*, 1998); the intergenic spacer between the *trnL* 3' exon and *trnF* in chloroplast DNA for intraspecific variation in *Cannabis sativa*; and the *trnK* sequence for identification of *Atractylodes*-derived crude drugs (Mizukami *et al.*, 2000). For animal-derived drugs, the 12s ribosomal RNA and cytochrome *b* genes have been used to identify two species of *Hippocampus* (Wu *et al.*, 1998b), 21 species of turtle shells (Wu *et al.*, 1998a) and to authenticate crude drugs from snakes (Wang and Zhou, 1996; 1997). Diagnostic primers have been derived from the cytochrome *b* sequence for the authentication of the crude drug *Zaocys dhumnades* (Wang *et al.*, 2000). Several chapters in this book are also devoted to using sequencing as a means for authenticating herbal and animal medicinal materials. Currently, a laboratory can easily generate more than a few thousand base pairs of DNA per day using an automatic DNA sequencer. Coupled with a further decline in the price of consumable materials and equipment used in sequencing, we expect that DNA sequencing will become a more common means for the authentication of Chinese medicinal materials.

### 1.3. Conclusion

Molecular technology provides an independent approach for the authentication of medicinal materials. Its impact on quality control is just emerging. It will be more fruitful if a concerted effort is made to integrate the existing molecular fingerprinting data and to co-ordinate future projects of molecular authentication of Chinese medicinal materials. One of the immediate tasks for researchers in this field is to compile a molecular

reference library with DNA sequences and fingerprints for traditional Chinese medicine. This is particularly important for those materials derived from endangered species, with high market value or imitated with poisonous adulterants.

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