

## Metabolomics and herbal medicines: opportunities from traditional knowledge

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There is a great demand for herbal medicines in developed and developing countries and therefore a great potential in the global market.[1] Herbal drug technology is used for converting botanicals into medicines. Botanical extracts, now more and more produced as new hi-tech products using modern pharmaceutical techniques, are not only the core products in the market of natural medicines, dietary supplements, and the raw materials of plant pharmaceutical reagents, but also used in nutrient supplements and cosmetic products. The global regulatory sector for herbal medicines is changing rapidly, and quality become a key issue in the development of herbal medicinal products that have consistent safety and efficacy.

Quality of herbal medicines can be evaluated using up to date authentication technologies including genomics and metabolomics tools.[2] Herbs authentication is a quality assurance process that ensures the correct plant species are used as raw materials for herbal medicines; genomic tools provide standardized and reliable methods for authentication of herbal materials at the DNA level. Authentication of herbal medicinal products (herbal extracts) can be achieved using metabolomics tools. Metabolomics deals with the quali/quantitative identification of all the metabolites present in a living organism. The metabolome is the end product of the biochemical chain DNA-RNA-protein-metabolite. DNA-based species identification alone is not sufficient for quality control of herbal medicines because plants are the products of both, the genome and the environment.

The herbal medicine's metabolites play a central role in mediating pharmacological effects. These compounds are the end products of specific pathways within the process of herbal medicine preparation, which represent the so called "pharmaceutical recipes". The chemistry of the finished products can be dramatically affected by the recipes adopted, exactly as occur for the culinary recipes and the corresponding preparation of foodstuffs.[3] Modern and traditional pharmaceutical recipes are most of the time completely different practices; this affect the quality, therefore also the safety and efficacy of the corresponding herbal medicines. The role of Metabolomics concerning the study of the pharmaceutical recipe effects will be presented in this talk.

### References

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3. Barham, P., et al., *Molecular gastronomy: a new emerging scientific discipline*. *Chem Rev*, 2010. **110**(4): p. 2313-65.