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Comprehensive extraction and NMR-based Metabolomics : novel approaches to natural products lead finding in drug discovery

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Stellingen

Behorende bij het proefschrift

Comprehensive extraction and NMR-based metabolomics: Novel approaches to natural products lead finding in drug discovery

1. By integrating the results of NMR metabolomics, comprehensive extraction, and bioassays, identification of false positive compounds or known active ones can be achieved in an early stage of a study for novel leads for drug development (this thesis).
2. To successfully apply NMR metabolomics for metabolites – bioactivity correlation studies, an extraction technique which can provide a wide range of metabolites with good resolution is required (this thesis).
3. Fractionation of crude extracts results in enrichment of minor compounds in the samples for bioassays, thus increasing chances of finding novel active compounds (this thesis).
4. Comprehensive extraction coupled to NMR metabolomics and *in-vivo* bioassays is the method to discover not only single compounds but also synergy between compounds and pro-drugs.
5. The tendency in current ethnopharmacology studies to over-interpret *in-vitro* results, (e.g. Gertsch, J. How scientific is the science in ethnopharmacology? Historical perspective and epistemological problems. *J Ethnopharmacol* 2009; 122: 177 – 183, Cos, P. *et al.* Anti-infective potential of natural products: How to develop a stronger *in-vitro* ‘proof-of-concept’. *J Ethnopharmacol* 2006; 106: 290–302), urges the need to set global standards for what should be considered as active.
6. Despite the rich chemodiversity in nature, developing new drugs from biodiversity has more challenges than from synthetics, because the production of natural products should be ‘sustainable’ and ‘intellectually fair’ (Cordell, GA. Biodiversity and drug discovery a symbiotic relationship. *Phytochemistry* 2000; 55: 463 -480).
7. The by purpose mixing of different plants as common in traditional medicine is a very interesting source for discovery of synergy between compounds in treating diseases.

8. Organic farming is an interesting model for developing novel strategies for crop protection in the conventional farming (e.g. Khan, ZR. *et al.* Exploiting chemical ecology and species diversity: stem borer and striga control for maize and sorghum in Africa. *Pest Manage Sci* 2000: 56; 957 – 962).
9. The hospitality of Dutch society is a good remedy for homesickness of foreign students but not for their Dutch speaking ability.
10. Rich natural and human resources are not sufficient to be a prosperous country, as good governance is also needed.
11. In a developed country, there is awareness that fast food is a cheaper and tastier choice but of lower nutrition status as compared to home-made food, while in a developing country, fast food is ironically viewed as a tasty and nutritious modern lifestyle not even regarding that they are more expensive than home-made food.
12. With the aim of engineering more healthy food, one may create new health problems.