

[PL-2] [11/29/2005(Tues) 13:30-14:30/ Grand Theater]

## **Chemical and Pharmacological Profiling of Natural Products Leads and Herbal Medicines**

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Natural products remain a major source of inspiration for the development of new drugs. Medicinal plants and phytomedicines play a major role in health care, in developing and industrialized countries.

Over the past two decades, a wealth of new technologies have become available in analytical chemistry and in the life sciences, but crossfertilization into natural product research has been rather slow. The lecture will review some of the technologies and possible approaches towards discovery of promising bioactive molecules. We will argue that a consequential implementation and judicious combination of these technologies and rigorous approaches is needed to move natural product research into a new era.

Academia should not attempt to imitate the industrial approach of target-driven high-throughput screening (HTS). Nonetheless, a state-of-the-art technology platform is required which combines analytical HPLC with various on-line detectors such as PDA, MS and NMR. Such platforms allow an extensive structural characterization of individual components in complex extracts without need to resort to preparative isolation.

The efficient tracking of bioactivity in an extract remains a major challenge. Various approaches for interfacing analytical separation with bioassays have been described in the literature. Some of these will be discussed, including HPLC-based activity profiling, biosensors and other on-line assays.

Access to the tools of molecular and cell biology is needed. For promising compounds, the molecular targets need to be characterized if the interest and cooperation of biomedical researchers and industry is to be elicited. The postgenomic era offers an array of new tools. Effects of extracts and compounds in a living system can be studied in an essentially unbiased way. For example, the effects of a compound on gene regulation are revealed by genome wide expression profiling *in vitro* or *in vivo*.

These aspects will be discussed and illustrated with various examples from the authors lab, including ongoing work on *Isatis tinctoria*, *Salvia miltiorrhiza*, *Cimicifuga racemosa*, and on metabolites produced by imperfect forms of entomogenous *Cordyceps* species.