hyperionherbs
change your life. change the world.

Brief Introduction

(Fingerprint Chromatograms Technology)

Natural products have served mankind as a source of medicine since — and even before — historical records began. Herbal extracts now play an important and growing role in disease prevention and therapy, and are used extensively as drugs and food additives.

Compared with synthetic chemical drug compounds, the composition of herbal extracts is far more complex. Consequently, their quality control is becoming an increasingly important issue. For example, by the European legislation (directive 2004/24/EC concerning "traditional herbal medicinal products") a more strict control on the quality and purity of these products is required. This is also the case by the State Drug Administration of China. It involves, for example, the creation of a type of monograph as a guideline to test the identity and quality.

Identity and quality can be derived from fingerprint chromatograms. These fingerprints can be defined as "a chromatographic pattern of an herbal extract showing some common pharmacologically active and/or chemical characteristic compounds".

Another reason for stricter quality control is to assess if other herbs/extracts are used than those expected. This can be a result of conscious adulterations where another plant is sold, to the unconscious mistaken use of "look-alikes".

The fingerprint chromatograms are also accepted by the World Health Organization (WHO) as an identification and qualification technique for medicinal herbs.

The main separation technique used in fingerprint development is high-performance liquid chromatography (HPLC) coupled to ultraviolet (UV), electric light scattering (ELS) and, occasionally, mass spectrometry (MS) detection. For fingerprint development, spectroscopic techniques, such as near infra-red (NIR), Raman, nuclear magnetic resonance spectroscopy (NMR), and other separation techniques, including thin layer chromatography (TLC) and capillary electrophoresis (CE) can also be used.

A herbal fingerprint can be developed for three main reasons: identification, classification or calibration. Identification confirms that a sample is originating from the herb expected and not from another source, to attain better quality control of the herbs.

Classification or clustering can be performed to classify samples according to, for example, their origin. A multivariate calibration can be performed when the herb or its extract can also be characterized by an activity, such as an antioxidant or cytotoxic activity. The activity can then be modelled as a function of the complete chromatogram. The goal of the modelling can be either to build models that can predict the activity for future samples based on the chromatogram, for example, the antioxidant activity from green tea, or to identify the main compounds/peaks responsible for a given activity.