Herbal Synergy

The therapeutic effects of many herbal medicines have been well established; however, definitive mechanisms of action remain to be elucidated for many psychoactive herbal medications. Although several mechanisms have been identified, they are often insufficient to account for the observed effects of the plant or its extracts (Spinella, 2002).

An interesting exploration in the field of phytotherapy, is in the area of ‘synergy’ which was advanced in a landmark paper by Williamson (2001) and further highlighted by Ulrich-Merzenich et al. (2007). The concept relates to the growing evidence that plant constituents may provide a ‘super additive’ biological effect when combined, as opposed to being just the sum of their individual parts (e.g. $1 + 1 = 5$, not 2). In simple terms, a whole plant extract (containing various chemically active constituents) may in some cases provide a greater (and usually safer) clinical effect, than isolated constituents.

Epigenetic studies are already demonstrating that combinations of constituents can not only have an added effect of triggering an increase in the number of expressed genes, they are in fact triggering new genes altogether (due potentially to altered histone and DNA methylation) (Jordan et al., 2010). An example of this can be found in a study of a multi-compound herbal product Phytodolor that contains three antiinflammatory herbs, and also in a study of isolated constituents in pyrrolizidine alkaloid containing Comfrey (Symphytum officinalis).

In both cases epigenetic assays showed that the gene expression profile of the whole formula and herb was unique, and did not reflect the effects from the individual herbs (in Phytodolor), nor individual constituents (in Comfrey) (Jordan et al., 2010). Epigenetic studies can be used as a ‘proof of concept’ in herbal psychopharmacology, to show that whole extracts have specific effects on gene transcription that may be aligned with conventional pharmacotherapies. Furthermore, investigations of individualized prescriptions using combinations of herbal medicines (such as in traditional practice) may demonstrate unique epigenetic effects (Sarris et al, 2012).

References:
Jordan SA, Cunningham DG, Marles RJ. 2010. Assessment of herbal medicinal products: challenges, and opportunities to increase the knowledge base for safety assessment. Toxicol Appl Pharmacol 243:

