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### Editorial

#### **Biomarker Research: the way forward to modern medicine**

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Medicine is evolving on the whole and the last decade has witnessed steady advances in literally all areas of disease management. One of these is personalized medicine and personalized nutrition. The former, personalized medicine (PM) is a new way of dealing with individual health, using a “personalized” approach sustained by high through-put technologies including pharmacogenetics, pharmacogenomics and epigenetics that are now interlinked with genomic medicine. Individuals have variations in the composition of their genetic characteristics that will affect the availability of functional proteins that

and the pharmaceutical terms “absorption, distribution, metabolism and excretion” have their equivalent when biomarkers are concerned. A valid point highlighted by the authors and which warrants extensive attention in the light of contradictory data generated from functional food based clinical studies for the past years is the concept of “biomarker kinetics”. Broadly speaking this comprises “formation, distribution, metabolism and excretion”. However, this is at present neither an established science nor common practice in nutrition research on functional foods. The authors rightly point out that sampling times and matrices, for example, are chosen on the basis of historical practice and convenience (for volunteers and scientists) but not on the basis of in depth insight. This may be one of the key factors that could bring

in the element of consistency, so much lacking in clinical studies.

The field of biomarker research is exciting and evolving at a fast pace. The momentum presented by the emerging interest of the role of biomarkers in the product lifecycle of drugs (from development to utilization) will continue to provide research and development opportunities for the drug manufacturers, regulatory agencies, academia, biotech organizations and research scientists globally. A special issue of the journal *Toxicology* on the future of biomarkers (Aruoma and Bahorun (2010) *Toxicology* 278(2)) addresses the emerging concepts and is highly recommended to the reader.

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