RESEARCH & DEVELOPMENT

A scientific approach to the identification, development and production of botanical active ingredients, continuous investment in research, design of proprietary technologies for the quality, safety and efficacy of ingredients; these are the pillars on which Indena has built its leadership in the botanical sector.

This commitment takes the form of financial investment (a significant part of the turnover is invested every year in research and development) but above all in human and professional resources. The Indena team of researchers proposes and participates in studies that are jointly conducted with over 40 research institutes and universities. The overall aim is to seek out new avenues and thoroughly examine the role that botanically derived ingredients may play in the health and well-being of people.

Today the company can boast over 100 primary patents and has more than 1000 published scientific studies to its credit, but Indena goes much further. In addition to scientific research on medicinal plant derivatives, the company has been working for years on the study of both the technology and new formulations to make the extracts increasingly safe and effective.

A significant example is the thinking behind **Phytosome®**, a proprietary system for the formulation of extracts that markedly optimizes their bioavailability and consequently their effectiveness which is scientifically documented.

Indena has long pursued a biomimetic approach, inspired by the processes of nature, epitomised in the concept of *Nature as Measure™*; **Phytosome®**, is a formulation that optimizes the bioavailability and pharmacokinetic profile of active compounds of natural origin using 100% food grade ingredients. These lecithins are natural surfactants which, together with bile salts, participate in the physiological process of absorption of lipophilic compounds and constitute the lipid bilayer of cell membranes, allowing compounds with low solubility in water to be more easily absorbed, for example by the intestine.

The effectiveness of Indena's phytosomal formulation is scientifically proven. An example is the case of turmeric with 35 scientific studies in humans, of which at least a third conducted with the randomized and controlled scheme.

Certain identification of the plant through **DNA analysis** is another area of research in which Indena has worked to verify and ensure the high quality of its ingredients. This is a crucial tool in the botanicals market which is prone to frequent adulterations.

Indena began dealing with this issue in 2010, and has developed sophisticated sequencing tests using ***DNA barcoding*** to guarantee the identification and traceability of the plant. Since no universal DNA barcoding methodology exists for plants, each requiring a dedicated method developed on its own genome, Indena has, for many years, been mapping the genetic identity of the raw materials used for its botanical extracts: such knowledge has enabled the company to develop analytical DNA identification tools specific for each species.

Indena is working on the further development of this technology, in order to apply it to the certain identification of extracts, as well as of the plants themselves. An initial result has already been achieved, with the application of the analysis to the bilberry extract produced by Indena. Dependable results and speed of technology confirm the reliability of the DNA barcoding method developed by Indena to guarantee the quality of its ingredients.