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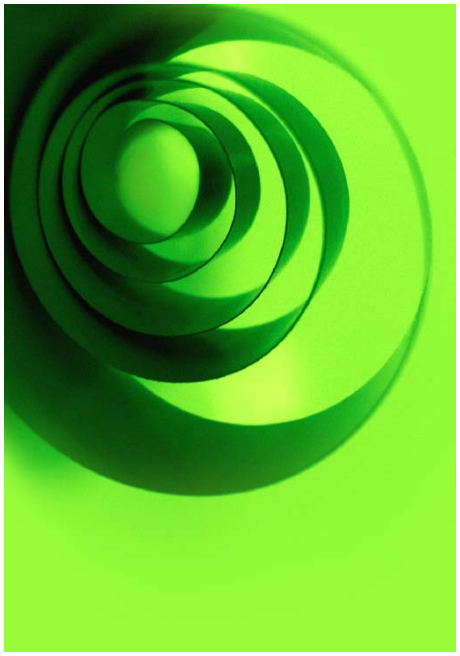

ABSTRACTS

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Food authentication by molecular methods

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Quality and authenticity evaluation of foods encompasses many issues, such as the entire or partial fraudulent substitution of higher commercial value constituents by others with lower value and the presence of undeclared constituents/ingredients. To protect consumers from misleading labeling, regulations issued across the world have implemented specific guidelines and listed particular foods that should be declared on the label. Particularly in the case of genetically modified foods, the introduction of specific regulations for labeling and traceability of genetically modified organisms (GMO) aimed to protect human health and environment and to give the consumer an informed choice. To address the referred food authenticity/safety problems, several analytical methodologies have been developed, particularly in processed foods, including refined oil matrices. For the first time, monitoring of amplifiable DNA in all the stages of a chemical refining industrial unit of soybean oil was succeeded by PCR techniques. Moreover, we have also proved that it is possible to detect GM soybean along the refining process of crude oil. The study was also extended with success to commercial refined oils produced from blends and pure soybean.
The development and application of molecular biology techniques as sustainable alternatives to classical analytical methods was effective in the identification of species in foods. Specifically, the quantitative detection of pork meat in model mixtures and processed foods was proposed and validated using a duplex PCR technique. The use of real-time PCR coupled to the novel approach of High Resolution Melting analysis was effectively applied to identify fruit species in juices, based on the polymorphism of plant barcode *loci*.