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Novel method of product authenticity and traceability testing using molecular techniques in combination with gold nanoprobe for food and agricultural applications

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Food authentication is an issue that has become increasingly important in recent years, due to the drive for more accurate and truthful labeling. European and global food policies require that food put on the market is authentic. The tools for the authentication of foods include protein rely on immunological or electrophoretic and chromatographic assays. Metabolite analysis is based mainly on HPLC, NMR, MS and DNA analyses. Protein and lipid-based methods are less effective, since the target biomarkers could be modified throughout the processing treatments, as they are affected by environmental conditions and industrial procedures. The most important techniques have been proved are those of DNA, thanks to the stability of DNA under production and processing techniques applied along the food-chain. However, methods using DNA analysis enable identifications from immature life stages, or fragmentary remains, offering a powerful tool to address the validation of food authenticity and traceability of primary products. Recently, the major technical advances in the analysis of DNA polymorphisms have occurred in SNPs detection. The usefulness of SNPs, as well as all the markers that reveal polymorphisms in the sequence of the bases, should be evaluated for each matrix or food product, considering the possible chemical changes that the industrial processing or storage conditions may induce in DNA sequence. Also, a gold nanoprobe strategy has developed which relies on the colorimetric differentiation of specific DNA sequences, based approach on differential aggregation profiles in the presence or absence of specific target hybridization.

Biography

Dimitra P Houhoula is an Assistant Professor of the Department of Food Technology, of Technological Educational Institute of Athens. She has a great experience in molecular techniques related to the identification of foodborne pathogens, food allergens and food adulteration. She served as an academic and research staff in NTUA (Greece) as well as in Ministry of National Defense (Institute of Defense Analysis). She has published more than 20 papers in peer-reviewed journals, and more than 40 presentations in national and international conferences. She has been working as a coordinator and partner in national and international scientific projects about Food Safety & Health.

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