



# ΙΤΕ/ΙΕΧΜΗ

## ΣΕΜΙΝΑΡΙΟ ΣΕΜΙΝΑΡΙΟ

**ΟΜΙΛΗΤΗΣ:** Θεόδωρος Χριστόπουλος, Καθηγητής  
Τμήμα Χημείας, Πανεπιστήμιο Πατρών

**ΘΕΜΑ:** DNA-Based Food Authenticity Assessment

**ΤΟΠΟΣ:** Αίθουσα Σεμιναρίων ΙΤΕ/ΙΕΧΜΗ

**ΗΜΕΡΟΜΗΝΙΑ:** Δευτέρα, 22 Ιουνίου 2015

**ΩΡΑ:** 12:30

### ΠΕΡΙΛΗΨΗ

Protection of consumers and producers from accidental or deliberate substitution of valuable food constituents with other lower value components necessitates the development of convenient and robust analytical methods that are suitable for routine authenticity assessment. In particular, identification of the species/variety origin has become a major issue in food authentication. Metabolite analysis is not sufficient to provide species and variety verification because the metabolic profile is affected by soil composition, climate conditions, stage of ripeness, extraction methods and storage period. On the contrary, DNA markers are unaffected by the aforementioned factors and enable the unambiguous identification of the origin of the sample. In this context, we have developed a high-throughput method for the identification of the variety origin of olive oil by DNA fingerprinting performed on spectrally encoded fluorescent microspheres. Furthermore, we have reported dipstick-type DNA biosensors that exploit the novel optical properties of nanoparticles and enable species identification by naked eye without the use of specialized instrumentation. As a model assay, the sensors were applied to the discrimination of *Coffea arabica* and *Coffea robusta* species in coffee authenticity assessment. Quantification is also an important aspect of food authenticity testing because in many instances there is a need not only to detect a food ingredient, or an adulterant, but to quantify it as well. The rapid progress in genetic engineering and its application to agriculture has led to the introduction of several genetically modified organisms (GMO)



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whose genome has been altered by the integration of a novel DNA sequence conferring a new trait. This presentation will include our research activities on the development of high-throughput methods for determination of the GMO content in grains and processed foodstuff. The quantitative assays are based on the combination of highly detectable bio(chemi)luminogenic protein reporters and performed in microtitration wells.

**Theodore Christopoulos** is a professor of Analytical Chemistry in the Department of Chemistry, University of Patras (since 1999), and a collaborating faculty member, ICEHT/FORTH (since 2000). His research activity is multidimensional, covering areas such as nanoparticle-based sensors, microanalytical devices (chips), fluorescence/time-resolved fluorescence spectroscopy, bio(chemi)luminescence, electrochemistry, chemical instrumentation, high-throughput analysis, DNA/RNA technology and immunoassay technology. The range of applications includes diagnostics, pathogen detection, pharmacogenomics, pharmaceutical analysis and food authenticity testing.

Prof. Christopoulos obtained his BSc in Pharmacy (1982) and his PhD in Analytical Chemistry from the University of Athens (1987) and then held a Postdoctoral Research Fellowship at the University of Toronto, Canada. Subsequently (1992), he was appointed assistant professor of Chemistry and Biochemistry, University of Windsor, Canada, and promoted to tenured associate professor (1996) and full professor (1999). In 1998 he was a visiting professor at Harvard University. He has given numerous invited lectures at Universities, Research Institutes and Conferences. He has published 110 papers in peer reviewed journals, 14 book chapters and 2 books. He is the recipient of the Grannis award for "Excellence in Research and Scientific Publication" from the U.S. National Academy of Clinical Biochemistry (1997).