

Amperometric Biosensors for the Determination of Beneficial Compounds for Human Health

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Polyphenolic compounds are a complex group of substrates which have gained a great attention in last years because they have important health properties and antioxidant activity. Amperometric biosensors based on peroxidases from *Brassica napus* hairy roots (PBHR) used to determine t-resveratrol (t-Res) and the total polyphenolic content in wine and tea samples were studied in our laboratory by the first time. The method employs carbon paste (CP) electrodes filled up with PBHR, ferrocene (Fc), and CP or multi-walled carbon nanotubes embedded in a mineral oil (MWCNT + MO) at a given composition (PBHR-Fc-(CP) MWCNT + MO). Biosensors were covered externally with a dialysis membrane, which was fixed at the electrode body side part with a Teflon laboratory film and an O-ring. Calibration curves obtained from steady-state currents as a function of the concentration of a polyphenolic standard reference

compound such as t-Res or caffeic acid (CA) were then used to estimate the total polyphenolic content in real samples. Statistical parameters such as reproducibility, repeatability, detection limits, and stability of biosensors were studied, showing a good performance of these devices. Moreover, this analytical methodology has some advantages over the classic HPLC methods, such as: the electrochemical instrumentation is cheaper, a lesser amount of solvents is required and the analysis time can be notably shortened.

The comparison with other biosensors will be discussed.

Nowadays, studies related to the application of these biosensors to determine polyphenolic compounds in pharmaceutical formulations are being carried out in our laboratory.

Biography

Professor María Alicia Zon has received her PhD in the Universidad Nacional de Río Cuarto (UNRC), Argentina, during the period of 1980–1985 and was a postdoctoral research associate at the Universidad de Córdoba, Spain (1990-1992). Currently, she is working as a Full Professor at the UNRC. She has authored more than forty research articles and book chapters and has been the co-editor of a book. She is a member of the National Council of Scientific and Technological Research (CONICET, Argentina) as an Independent Researcher. She is an AAQA, AAIFQ and SIBAE fellow and he has been honoured as Secretary of Asociación Argentina de Químicos Analíticos (AAQA, 2007-2009).

