**EQUIPMENT-FREE ASSAYS FOR BIOTHIOLS TESTING**

**AT THE POINT-OF-NEED AND RESOURCE-LIMITED SETTINGS**

Dimosthenis L. Giokas

Laboratory of Analytical Chemistry, Department of Chemistry, University of Ioannina,

45110, Ioannina, Greece.

E-mail: dgiokas@cc.uoi.gr

Biothiols are naturally occurring compounds that play pivotal role in many biological processes. The determination of biothiols in biological fluids has been based on instrumental techniques such as molecular spectrometry, chromatography, capillary electrophoresis, electrochemistry and mass spectrometry. The concentration of biothiols, therefore, may not be routinely used in ordinary biochemical laboratories as an indicator of pathological conditions.

This presentation discusses a series of new analytical methods designed for testing the presence of biothiols using low-cost, ambiguous electronic devices as detectors. Hand-held cameras, flatbed scanners, chronometers and the bare eye are used in combination with novel colorimetric signal transduction mechanisms to obtain qualitative and quantitative evidence regarding the presence of biothiols species (cysteine, glutathione, homocysteine) in biological fluids (blood plasma and urine). The principles of each method and their specific attributes will be discussed both in comparison to previous methods as well as in comparison to each other in order to demonstrate their potential utility in different environments and non-laboratory conditions.

KEYWORDS: Biothiols, equipment-free assays, nanomaterials, optical detection