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XXVII Congresso Divisione di Chimica Analitica

16-20 Settembre 2018, Bologna



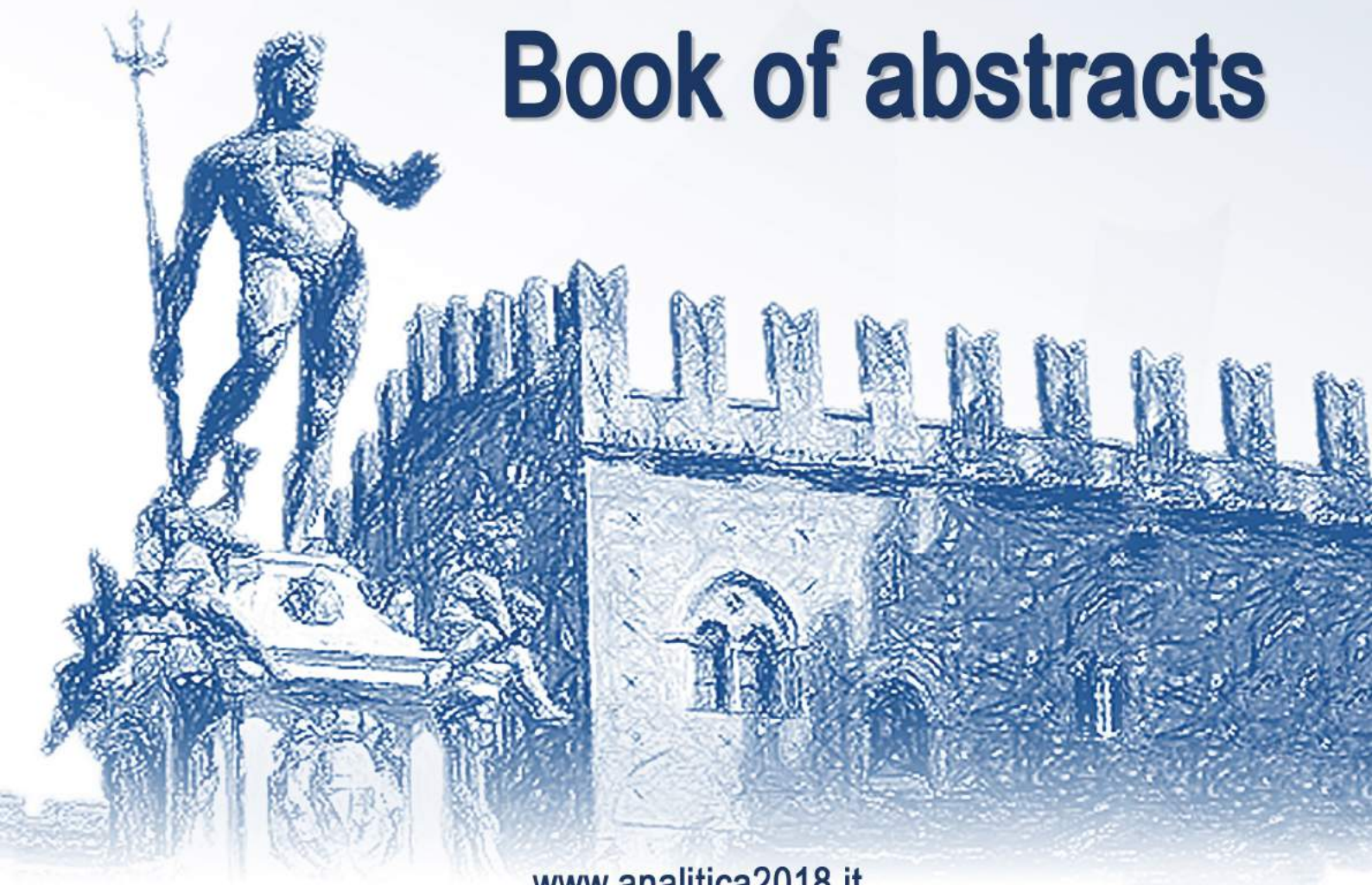
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EVALUATION OF AN ELIME ASSAY TO REVEAL THE PRESENCE OF **HEPATITIS A** IN DRINKING WATER

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Water-borne viral diseases pose high risks for public health worldwide. Urban wastewaters contain large number of pathogenic viruses, and full removal of virus particles cannot be guaranteed by conventional wastewater treatments. Presently, water quality indicators rely on bacterial fecal indicators, which do not provide adequate information about the presence of pathogenic viruses. Current legislation for microbial contamination in food products and for hygiene in primary production (EC 2073/2005, EC 853/2004, EC 852/2004) does not include any specific provision on enteric viruses in waters used in food production environments or for irrigation purposes. The currently available tests for virus detection, based on molecular biology, are expensive and labor intensive, thus limited to laboratories with suitable equipment and well-trained personnel. Nevertheless, the protection of water networks against pathogenic viruses is crucial. In this work, a cost effective and rapid system for Hepatitis A virus (HAV) monitoring in different freshwater bodies is designed. An electrochemical sandwich Enzyme Linked Immuno Magnetic assays (ELIME) is proposed [1]. The system is based on the use of Goat Anti-Mouse IgG magnetic beads as solid support for the immunochemical chain, and screen-printed electrodes as a sensing platform. This rapid, sensitive and low-cost analysis method involves the use of a portable instrument, able to perform measurements directly in the field. Using these ELIME assays, a quantitative determination of HAV can be achieved with a detection limit of 0.4 genome copies /mL. The proposed system was successfully applied to detect HAV in drinking water. Results obtained on spiked samples were compared to those obtained by the standardized qRT-PCR analysis (ISO 15216-1) commonly applied to assess HAV presence in water samples.

[1] L. Micheli, A. Fasoli, A. Attar, D. T. Donia, M. Divizia, A. Amine, G. Palleschi, P. A. Salazar Carballo, D. Moscone (2017) *Procedia Technology*, 27, 85-86