

## ***The interaction between CA199-His antigen and graphene-modified electrodes***

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### ***Abstract***

The carbohydrate antigen CA19-9 is a highly sialylated glycoprotein that has been intensively studied and proved its importance in the detection of pancreatic, ovarian, gastric or colorectal cancer. Its detection by electrochemical methods would be simple and more sensitive, but so far it is dependent on antigen-antibody interaction. We are reporting the electrochemical detection of CA 19-9 tagged with L-Histidine (CA199-His), taking advantage of the imidazole side-chain of histidine which is prone to electrochemical oxidation. The electrochemical oxidation of CA199-His molecules was investigated for the first time in our group with screen-printed (DS) electrodes modified with GO or TRGO and the results were compared with those obtained for bare DS. Before testing the electrochemical oxidation of CA199-His at the bare and DS modified electrodes, the L-Histidine behaviour was investigated by cyclic voltammetry in PBS electrolyte (pH values from 6 to 8). In all cases, the oxidation peak (around +1.1 V) is very broad, indicating a slow transfer of electrons between the DS surface and the analyte molecules. In addition, the interaction of CA199-His with graphene oxide and thermally reduced graphene oxide was studied by isothermal calorimetry and the results were correlated with the measured electrochemical behaviour.

### ***Biography:***

Crina Socaci has completed her PhD at the age of 27 years from Babes-Bolyai University Cluj-Napoca, Romania and postdoctoral studies from University of Athens, Greece. She is Senior researcher II at the National Institute of Research and Development for Molecular Technologies and Isotopes from Cluj-Napoca. During her career path, she was awarded a DAAD fellowship at Humboldt University of Berlin and a CEEPUS scholarship at Charles University of Prague. She has 52 publications with a Hirsch index of 15 and 566 citations (Web of Science).

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