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Synthesis of quantum dots conjugates with antibodies for immunochromatographic analysis

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There are large number of different markers used in immunochromatographic analysis (IChA). The use of quantum dots markers fluorescent in near infrared (NIR) region is promising in bioassay. We investigated here sandwich method of IChA. Quantum dots (QDs) exhibit strong and narrow band-edge luminescence. Due to their unique optical properties, QDs are perfect fluorescent markers for molecular diagnostics of diseases. It is possible to synthesize QDs with fluorescence in NIR, where background fluorescence of biological samples is low. Highly bright and photo-stable NIR-emitting CdTeSe/CdS/CdZnS QDs were synthesized following the method. QDs were functionalized with COOH-group using thiol-modified polyvinylpyrrolidone. As a model antigen, we used glycoprotein gB of nonpathogenic for human being Aujeszky's disease virus. QDs were covalently conjugated with monoclonal antibodies to glycoprotein gB of the virus using carbodiimide methods. The conjugates were tested on test strips manufactured by following the method. The investigation showed that the optimal excitation wavelength was of 450 nm, where the background luminescence was low and fluorescence peaks of test and control zones test strip were more pronounced. Calibration curve for the quantitative determination of antigens was drawn in a range up to 25 fmol in the sample. Antigen limit of detection is of 4.2 fmol in the sample.

Biography

Ibragimova Sagila Aladdinovna completed her graduation with honors at State University of Dubna in Department of Chemistry, New Technologies and Materials and defended her Master's thesis entitled "Synthesizing quantum dot conjugates with monoclonal antibodies to glycoprotein gB of Aujeszky's disease virus for immunochromatographic analysis" in 2016. Her scientific work is related to the immunochromatographic analysis using as markers and quantum dots. She is Co-author of four books, has two patents and participated in nine national and international conferences.

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