

Rapid diagnosis of active schistosomiasis by newly developed lateral-flow immune chromatographic strip using monoclonal antibody conjugated to colloidal gold and mesoporous silica nanoparticles

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Abstract:

Objective: Development of new sandwich based lateral flow immunochromatographic strip (LFIS) to detect circulating Schistosoma mansoni antigen (CSA) in serum and urine samples of patients with active schistosomiasis. Methods: This highly sensitive LFIS was prepared by using anti – S. mansoni soluble egg antigen monoclonal antibody conjugated gold nanoparticles (MAb-AuNps) as a primary antibody while mobile crystalline material (MCM)-41-MAb bioconjugate was immobilized at the test line as secondary antibody. Primary and secondary antibodies formed a sandwich complex with CSA in the sample, immobilized at the test line and resulting in a distinct red color. The assay reliability was examined by using urine and serum samples of 60 S. mansoni infected patients, 20 patients with other parasites, 20 healthy individuals and results were compared with those obtained via sandwich ELISA. Results: The visual detection limit of CSA by LFIS was 3ng/ml compared to 30ng/ml low detection limit by ELISA .The sensitivity and specificity of LFIS in urine samples were 98.3% and 97.5 % respectively compared to 93.5% and 90% by ELISA. In serum samples, it was 100% and 97.5% respectively compared to 97% and 95% by ELISA.

Conclusions: This new LFIS offers a sensitive, rapid (10 min) and field applicable alternative technique for diagnosis of active schistosomiasis.

Biography:

Manal Kamel, is a Professor of Immunology at Theodor Bilharz Research Institute (TBRI), Giza, Egypt. She graduated from the Faculty of Medicine, Cairo University. Her postgraduate studies were in immunology and clinical Pathology . She has a great experience in the fields of antigen preparation, nanotechnology, monoclonal production, CB MSCs transplantation. She supervised (9) M.Sc. and Ph.D thesis, two of them in the field of nanotechnology with stem cells and monoclonal antibodies. She has published more than 23 papers in reputed journals and has been serving as member in the selected referee lists of: The International Journal of Immunological Studies-Cellproliferation

Speaker Publications:

1. Three-Dimensional Hepatocyte Differentiated MSCs vs. 2D Cell Culture in induction of Hepatic Regeneration in An Experimental Model, Journal of Nanomaterials & Molecular Nanotechnology, February 2020
2. Ionic liquid green synthesis of CeO₂ nanorods and nanocubes: Investigation of the shape dependent on catalytic performance, Journal of Molecular Liquids, Volume 279, 1 April 2019

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