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Development of a New Solid Phase for Simultaneous Detection of Antibodies in Human Serum

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Objectives: To develop a two-antigenic ELISA for combined screening for HIV-1 and HCV. High rate of HCV/HIV co-infection rate have become a global concern in recent years. Likewise, in Iran due to Injection Drug Use (IDU), the dominant transmission pattern, this rate is increasingly on the rise standing at approximately 70 percent. To reduce screening costs, an ELISA with a new solid phase system for simultaneous detection of HCV and HIV-1 infections was explored. Study Design and Methods: Sera samples from patients infected with HIV-1, HCV, and negative controls were tested. In the new ELISA, wells were primarily coated with Streptavidin overnight followed by blocking with bovine serum albumin. Then biotinylated gp 41 (HIV-1 antigens) and recombinant core and NS4 antigens (HCV antigens) were added to wells either separately or simultaneously. Then, the alkaline phosphatase (AP)-conjugated anti-human IgG secondary antibodies and para-nitro phenyl phosphate (pNPP) substrates were added to wells followed by reading ODs at 450 nm. Results: Both single and combined assays showed high diagnostic sensitivity and specificity of about 99 percent and 97 percent respectively. Conclusions: Due to differences in physicochemical properties, antigens require various coating conditions. However, by using this method, multi antigens could be coated on a well surface to obtain an efficient, inexpensive and accurate detection.

Table: Comparison of diagnostic specificity and sensitivity of all four assays. 150 sera samples from patients infected with HIV and 150 sera samples from patients infected with HCV were tested using the new assays

Assay Type	Sensitivity (%)	Specificity (%)
HIV-1 Single Assay	98	97
HIV-1 Combined Assay	98	97
HCV Single Assay	98	97
HCV Combined Assay	98	94

Biography

PhD in Chemical Engineering on 2005 at Laval University-Canada; Postdoctoral in both Queen's University-Canada and in Dow Chemical New Jersey-USA for more than one year. 2008-2013 Research Director in Moroccan Foundation for advanced Science Innovation and Research and in the meantime, Director of Technology Platform. Since 2013 Full Professor at Euromed University of Fes-Morocco.

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