

## **AN IMPROVED HEPATITIS C ANTIBODY IMMUNOASSAY USING CONFORMATIONAL AND GENOTYPE SPECIFIC ANTIGENS**

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**Background:** The currently licensed HCV ELISA tests use recombinant proteins purified under denaturing conditions. There is evidence that conformational HCV epitopes are more immunoreactive and would assist in improving test sensitivity.

**Methods:** We have designed an HCV antibody assay using a conformational protein NS3/4a and linear fusion proteins MEFA 7.1 and MEFA 7.2 that incorporate all immunodominant epitopes of HCV (core, E1, E2, NS3, NS4 and NS5).

**Results:** NS3/4a purified under non-denaturing conditions retains enzymatic activity and can detect early seroconversion conformational antibodies better than the c33c antigen. The NS3/4a protein also cross-reacts with different genotype samples better than the c33c antigen. The combination of NS3/4a and MEFA 7.1 detected c33c and c22-3 early seroconversion panels 2.7 and 4.6 days earlier than the Abbott Prism and HCV 3.0, respectively. Although MEFA 7.1 is cleaved by NS3/4a the degraded MEFA 7.1 remains immunoreactive. To overcome this proteolysis all the NS3/4a cleavage sites were removed from MEFA 7.1 and the MEFA 7.2 antigen was generated. MEFA 7.2 has similar expression level as MEFA 7.1 and can be purified using the same procedure. We demonstrate that MEFA 7.2 has very little degradation in the presence of NS3/4a and preserves all epitopes contained in MEFA 7.1.

**Conclusion:** The availability of new recombinant antigens may assist in the development of more sensitive blood screening tests for HCV.