Hepatitis C virus (HCV) is the major cause of chronic liver disease infecting 170 million people worldwide. The HCV core protein (HCVCP) is involved with the nucleocapsid assembly and with different cellular processes. The interaction of HCVCP with the tumor suppressor protein p53 in hepatocellular carcinoma has been described but the mechanisms involved in this interaction remain unknown. The regions 22-39, 50-67, and 85-102 of the HCVCP are important for the nucleocapsid assembly. To a better understanding of structural and physicochemical aspects of the interaction of these peptides with the RNA and with the viral envelope during HCV assembly, we used different membrane models (micelles) and non-specific nucleic acids. In the presence of different micelles, only the peptide 85-102 adopted an alpha-helix structure as verified by circular dichroism. Analyses of tryptophan intrinsic fluorescence and acrylamide quenching indicate that the interaction between peptide 85-102 and micelles involves the tryptophan residues. Although the calorimetric measurements showed the interaction of the peptide 50-67 with different DNAs, fluorescence polarization data showed that the presence of these peptides do not prevent the formation of NLs promoted by interaction between HCVCP and DNAs. Additionally to these studies, we also investigate the cellular localization of HCVCP fused with the Green Fluorescent Protein (GFP) (HCVCPGFP) in HepG2 and Huh7 cells. Confocal microscopy data showed that 24 hours post transfection the HCVCPGFP is located in the nucleus. However, in Huh7 cells, HCVCPGFP seems to be located on lipid droplets surface. To investigate the interaction between HCVCPGFP and p53 in HepG2 and H1299 cells, we also constructed a vector to express the p53 full-length fused to DsRed-Monomer and Fluorescence Resonance Energy Transfer analyses are in progress. Our data reveal a new approach to understand the HCV assembly and the HCVCP-p53 interaction, which are a great target for the development of anti-HCV drugs.

Keywords: Hepatitis C virus, p53, peptides, virus assembly.
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