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Eve-Isabelle Pecheur

Cancer Research Center of Lyon, France

Hepatitis C virus infection: A subtle but toxic combination of lipids, proteins and sugars

Viruses are obligate intracellular agents that depend on host cells for successful propagation, hijacking cellular machineries to their own profit. The *hepatitis C virus* (HCV) is a strictly human pathogen, causing chronic liver injuries accompanied by lipid disorders. Upon infection, in addition to protein-protein and protein-RNA interactions usual for such a positive-strand RNA virus, HCV relies on protein-sugar and protein-lipid interactions at multiple steps of its life cycle to establish persistent infection. En route from the blood stream to hepatocytes of the liver, its target cells, HCV encounters a specific micro-environment at the surface of hepatocytes, comprising glycoproteins, proteoglycans and polysaccharides, called the glycocalyx. Protein-sugar interactions therefore occur, that I will explore to address how HCV infection modulates the hepatocyte glycocalyx, and in return how this peculiar region of the cell adapts to the persistent presence of the virus. After this journey through the glycocalyx, HCV penetrates into the hepatocyte, which relies on subtle protein-protein and protein-lipid interactions dissected through structural, biochemical and biophysical analyses. HCV infection subsequently leads to a major reshuffle of the endoplasmic reticulum, the intracellular compartment where viral replication takes place, implying intense underlying protein-lipid interactions. I will also explore how *de novo* production and assembly of viral particles are inseparable from cellular lipid metabolism, since lipoproteins are structural components of neoformed virions. Each of these steps are potential therapeutic targets, which will be discussed at the light of current antiviral strategies.

Biography

Eve-Isabelle Pecheur has completed her PhD in 1997 from University Paris XI and Post-doctoral studies from Groningen University of Medical Sciences (Netherlands). She leads a research group at the Cancer Research Center of Lyon. She has published more than 50 papers in reputed journals. She is serving as an Editorial Board Member of Antiviral Research, and as an Academic Editor of *PLoS ONE*.

eve-isabelle.pecheur@inserm.fr