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HCV infection: Some perplexity on therapeutic vaccines

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Background: Recent studies demonstrated that host/virus interactions are crucial tools in progression of high percentages of cases infected by HCV. There are very strong evidences that virus persistence and transition from acute to chronic phase of the infection are mainly conditioned by the kind of host's immune responses.

Researches unresolved problems: Chimpanzees are the only alternative model of human infection. Thus, human cellular lines and small animal models may be somehow not sufficient to account for the study of the whole host/virus interactions in humans, to predict outcomes, to explain interactive mechanisms and try therapeutic vaccines, since studies mostly lack the reproduction of the micro environment which the virus is exposed to. HCV high mutation rate, to modify or to avoid reactions, is considered the main active strategy which the host seems passively undergo to.

Teleological Host Reactions Evidences: Facing the main problems, when infected, i.e. clearing the virus in due time, otherwise balancing the infection, avoiding autoimmunity induction and uncontrolled cells production (to do not determine other dangerous outcomes), the host punctually has to choose the appropriate reactions, maintaining at the same time the control of both virus diffusion and his own safety. Main disposable mechanisms are here briefly exposed and connected to their function and finality on the host's side.

Consequences on immune therapies and therapeutic vaccines: Till now the only positive results are gained by a poorly tolerated therapy (with more or less 50% failures) and postulated potentially dangerous modifications of immune responses. Overall, it seems that any helpful intervention has more chances to be efficacious during the early phase of the infection, before the anergic choice by the host, that may lead to a tolerance status difficult to remove, is primed or established. This implies the need of both a precocious diagnosis and precocious therapy, being the main factor actually hampering therapeutic vaccines attempts. Furthermore, it seems that one therapeutic approach alone cannot resolve the dramatic complexity of virus/host/tumor interactions. Thus, combinations of single approaches are needed unless significant improvements in knowledge and validation of new hypotheses will change the rule.

Biography

Salvatore Marco Criscione, male, physician, graduated in medicine from University la Sapienza Rome in 1970. He worked for the University of Rome "la Sapienza" (1970-1987) as : Assistant in Internal Medicine (1970-1973); Assistant in Paediatric Clinic (1973-1980); Associate Professor of Paediatrics (1980-1987). He became Full Professor of Paediatrics (1988) in the University of L'Aquila (Italy) - Department of Experimental Medicine and Chief of the Academic Paediatric Area (including: Paediatric Clinic, Neonatology, Infantile Neuropsichiatry, Paediatric Surgery)
Specialistic graduations: Endocrinology and Metabolic Diseases (1973); Paediatrics (1976); Fellowship in Allergy & Immunology (1977) His scientific main works deal with: Hypertension, Electron Mycroscope Studies on Liver, Seminal Liquid. In Children: Epidemiology of Pulmonary Diseases, Allergy, Coeliac Disease, Thyroid, Respiratory Viruses Infections, Host/Virus interactions. He was the only Italian partner of a European Project: AIM (Advanced Informatics in Medicine) on Quality Assurance in Pediatric Care and past member of APA (Ambulatory Pediatric Association- USA). Now retired (from 2004).

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Visceral leishmaniasis: Prospects of liposomal vaccine

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Visceral leishmaniasis (VL) is the most severe form of the infectious disease leishmaniasis, caused by Leishmania donovani. Since no prevention method is available and as current therapy is costly, poorly tolerated and not always efficacious, development of vaccines constitutes the priority to fight against the disease. In our attempt to design vaccine using cationic liposomes as adjuvant, we have purified five polypeptides 91, 72, 51, 36 and 31-kDa from leishmanial antigen. Vaccination with liposomal formulation of all these antigens induced significant but varied level of protection in BALB/c mice. Analysis of the cytokine responses in immunized mice revealed that all the vaccinated groups produced prechallenge IFN-γ, IL-12 and IL-4 which correlated inversely with the parasite burden both in liver and spleen. After challenge infection induction of Th1 cytokines IFN-γ with IL-12 and a down-regulation of Th2 cytokines IL-4 along with immunosuppressive IL-10, hinted toward a Th1 polarized immune response instrumental for protection. The 72, 51, 36 and 31-kDa bands were identified as heat shock 70-related protein 1 precursor of L. major, β-tubulin, Elongation factor-1α and ATP synthase α chain respectively using matrix-assisted laser desorption ionization–time of flight (MALDI-TOF/TOF) mass spectrometry. Thus, these leishmanial antigens can be potential components of future antileishmaniasis vaccines.

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