ORAL PRESENTATIONS

Title: Nodavirus-host interplay: what we know and what is next

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Abstract:
Nervous necrosis virus (NNV, Nodaviridae family, Betanodavirus genus) is a bisegmented ssRNA virus that is classified into four species: SJNNV, RGNNV, TPNNV and BFNNV. NNV is the etiological agent of viral nervous necrosis, a disease that affects farmed fish worldwide and in the Mediterranean area is a serious threat for European sea bass (*Dicentrarchus labrax*), Senegalese sole (*Solea senegalensis*) and gilthead seabream (*Sparus aurata*). This study is focused on three different aspects of NNV-host interplay: (i) the variability of RGNNV populations and their association with RGNNV virulence; (ii) the relation between NNV virulence and host immune response; and (iii) the effect of a supplemented diet on the immune gene response caused by NNV infection. The intrahost genetic variability of RGNNV was characterized by NGS in sea bass. The entire quasispecies changed as a consequence of a single point mutation in the consensus sequence of RNA2. Furthermore, the quasispecies generated in seabream specimens, which showed lower susceptibility than sea bass, possessed different genetic characteristics, thus suggesting that changes were associated with the isolate virulence across hosts. The comparison of the immunegene response triggered in sea bass brain by a virulent wild-type RGNNV and the single mutation isolate of lower virulence, revealed important differences. Actually, the lower virulence was associated with a delayed IFN I system response and an early and transitory inflammation and cell-mediated response, suggesting they can be key elements in controlling the infection. Regarding the diet, sonicated extracts of Shewanella putrefaciens Pdp11 (SpPdp11) reduced RGNNV multiplication, stimulating sea bass immune response and favouring a higher survival rate. In fish fed a SpPdp11 supplemented diet and subsequently infected with RGNNV, a regulatory effect on pathways related to nervous function was recorded: diet supplemented with SpPdp11 extracts appears to mitigate the genetic dysregulation associated with RGNNV infection.