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Transcriptomics: High-throughput sequence analysis

- 454 – R. philippinarum
- 454 – M. galloprovincialis
- RNAseq (millions of sequences): M. galloprovincialis

Microarrays

- R. philippinarum challenged with V. alginolyticus (Moreira et al., 2020)
- Signaling
- Apoptosis
- Immunity and defense
- Homoeostasis
- Return to local conditions

Applications

- Identification of bioactive molecules:
  - Caspases and apoptotic genes in mussel
  - Pore-forming molecules in mussel (Díaz-Rosales et al., 2013)
  - Immune pathways inferred from the Manila clam 454 results (Moreira et al., 2013): putative "immune molecules"

- The antimicrobial peptides: highly expressed genes in bivalves:

  - Identification of high variable molecules in mussel: Mytilin C, an antimicrobial peptide with chemotactic, antiviral and immunoregulatory properties (Nunes et al., 2013)

  - Expression studies:
    - Immunocompetence in mussel larvae

Use of immune genes as immunostimulants: IL-22, a bioactive molecule and key regulator

- Expression of immune genes as immunostimulants: IL-22, a bioactive molecule and key regulator

Use of immune genes to produce a higher protection induced by DNA vaccine against VHSV in turbot:

- Identification of bioactive molecules:
  - Necrocidin (Pereiro et al., 2012)
  - NK lyser immunofluorescence assay:
    - NK lyser expressing cells do not become infected
    - Green: SVVC infected EPC cells
    - Orange: NK lyser expressing cells
  - Immune pathway inferred from the turbot 454 results (Pereiro et al., 2012): TLR signaling pathway | B-cell & T-cell signaling pathway | Apoptosis | Complement cascade

The zebrafish as a model for the study of immune responses and infectious diseases:

3D reconstruction of the effect of the KHV infection in zebrafish embryos after 24 hours.

The virus induces cell death by apoptosis and necrosis mechanisms.