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My research focuses on genomics, immunity and adaptation in non-model animal invertebrates, with a particular emphasis on the Mediterranean mussel *Mytilus galloprovincialis*. I use transcriptomic, genomic, and evolutionary approaches to understand how mussels interact with pathogens and cope with challenging and changing environments. Over the years, I have worked on the discovery and characterization of major immune gene families and bioactive peptides in mussels, contributing to a broader view of the molecular basis of mussel immunity. I have been involved as a lead author in the publication of the first draft of the mussel genome, helping to reveal the remarkable extent of gene presence/absence variation and its links to immune diversity and adaptation. My current interests include the evolution of dispensable genes, the molecular diversification of the key players in pathogen recognition and killing, and the genomic basis of resilience in organisms facing environmental stress or adapted to extreme environments. With an ongoing project in collaboration with several international colleagues, I am trying to obtain a comprehensive pangenome for the *Mytilus* species complex, with the aim to aid the scientific community in the interpretation of complex and often confusing omic data generated from mussels.

Selected mussel-related publications (past 10 years)

1. Leoni G, De Poli A, Mardirossian M, Gambato S, Florian F, Venier P, Wilson DN, Tossi A, Pallavicini A, Gerdol M^s: [Myticalins: a Novel Multigenic Family of Linear, Cationic Antimicrobial Peptides from Marine Mussels \(*Mytilus* spp.\)](#). *Marine Drugs* 2017, **15**:261
2. Novoa B, Figueras A, Rey-Campos M, Moreira R, Gerdol M, Pallavicini A: [Immune tolerance in *Mytilus galloprovincialis* haemocytes after repeated contact with *Vibrio splendidus*](#). *Frontiers in Immunology* 2019; **10**:1894
1. Gerdol M, Greco S, Pallavicini A: [Extensive tandem duplication events drive the expansion of the C1q-Domain-Containing gene family in bivalves](#). *Marine Drugs* 2019; **17**(10):583
2. Gerdol M, Moreira R, Cruz F, Gomez-Garrido J Vlasova A, Rosani U, Venier P, Naranjo-Ortiz MA, Murgarella M, Greco S, Balseiro P, Corvelo A, Frias L, Gut M, Gabaldon T, Pallavicini A, Canchaya C, Novoa B, Alioto TS, Posada D, Figueras A: [Massive gene presence-absence variation shapes an open pan-genome in the Mediterranean mussel](#). *Genome Biology* 2020. **21**:275
3. Calcino A, Kenny N, Gerdol M: [Single individual structural variant detection uncovers widespread hemizyosity in molluscs](#). *Philosophical Transactions of the Royal Society B* 2021. **376**:20200153
4. [Chromosome-level genome assembly of the blue mussel *Mytilus chilensis* reveals molecular signatures facing the marine environment](#). Gallardo-Escárate C, Valenzuela-Muñoz V, Nuñez-Acuña G, Valenzuela-Miranda D, Tapia F, Yévenes M, Gajardo G, Toro JE, Oyarzún PA, Arriagada G, Novoa B, Figueras A, Roberts S, Gerdol M. *Genes* 2023. **14**(4):876
5. [Gene presence/absence variation in *Mytilus galloprovincialis* and its implications in gene expression and adaptation](#). Saco A, Rey-Campos M, Gallardo-Escarate C, Gerdol M, Novoa A, Figueras A. *iScience* 2023
6. [The mytilin gene cluster: shedding light on the enigmatic origin of mussel dispensable genes](#). Gerdol M, Saco A, Riommi D, Greco S, Kireta D, Edomi P, Rey-Campos M, Novoa B, Figueras A, Pallavicini A. *Fish and Shellfish Immunology* 2025. 110286