



## The MESCAL project: strategies of colonization and adaptation to extreme deep-sea hydrothermal environments

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On the East Pacific Rise (EPR), the specificity of the deep-sea hydrothermal vent ecosystem relies on the intense volcanic and tectonic activities which characterize fast spreading centers. The endemic species which thrive around the vents possess unique adaptative and evolutive traits with no equivalent in the deep-sea biota. Not only these species possess very specific adaptations to their chaotic environment, but they managed to prosper and form highly productive communities. The flourishing fields of tubeworms (*Riftia pachyptila*) – a chemoautotrophic endosymbiosis with a spectacular growth rate – or the dense colonies of Pompeii worms (*Alvinella pompejana*) – living on smoker walls where temperature often reach 100°C – are still striking examples of these adaptations. Today we possess improved tools to investigate the biological adaptations and colonization strategies of the endemic fauna of this extreme environment, combining *in situ* chemical analysis, *in vivo* experimentation under pressure, and *in vitro* genomic approaches. Building on our past experience of this area and species acquired during previous cruises (HOT 96, HOPE 99, PHARE 02), the MESCAL cruise will focus on two themes: the colonization strategies and adapta-

tion to thermal and chemical stresses on chimney walls, and the integrative biology of thiotrophic endosymbioses.