

Lecture Series & Workshops 2019-2021

From Single Organisms to Systems Ecology and Evolution

The art of harnessing dark energy: symbioses between chemosynthetic bacteria and marine invertebrates

Pr. Nicole DUBILIER

MPI for Marine Microbiology, Bremen

- 1st of April 2020, **1 PM**
- Campus Belval, Maison du Savoir; **Amphi 3.520**

For individual afternoon meetings with Pr. Dubilier, please **register** by mail to secretary@microbiology.lu.

Symbioses between chemosynthetic bacteria and marine invertebrates were first discovered at hydrothermal vents in the deep sea but are now known to occur in a wide range of habitats including coral reef sediments, seagrass beds, cold seeps and sunken whale carcasses. In these nutritional associations, the bacterial symbionts use chemical energy sources such as hydrogen sulfide to fix CO₂ into organic compounds and feed their hosts. Chemosynthetic symbioses have evolved multiple times in convergent evolution from numerous bacterial lineages, and occur in at least nine protist and animal groups such as ciliates, flatworms, mussels, clams, snails, annelids, and nematodes. Similar to Darwin's finches, whose beaks have evolved different shapes and forms as an adaptation to different food sources, the symbionts of hosts from chemosynthetic environments have acquired a wide and flexible repertoire of assimilation pathways in adaptation to the energy and carbon sources available in their environment. Intriguingly, this flexibility appears to have been gained through horizontal gene transfer. In my talk, I will describe how our toolkit of methods ranging from in situ experiments to meta'omic' and imaging analyses of chemosynthetic symbioses have revealed that horizontal gene transfer and symbiont diversity play a key role in the ecology and evolution of these host-microbe associations.

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