

## Until 2022

Since the development of microbes and higher eukaryotes coevolution has resulted in specific interaction mechanisms. It is well known that **symbiotic bacteria and fungi** influence the life cycle, and are essential for the homeostasis of many eukaryotes. However, in most cases, the factors driving and influencing the cross-kingdom interactions are unknown.

**We focus on the** structural identification of microbial chemical mediators that are important to maintain the symbiotic life style of the producing organisms.

To study the chemical signals we apply state-of-the-art analytical tools:

- Analytical Chemistry (UHPLC, UHPLC-MS, NMR, MALDI etc.)
- Genome Mining and Molecular Biology
- Organic Synthesis (total synthesis and natural product derivatization)

## Natural Products of Microbial Symbionts of Termites

Fungus-growing termites rear a symbiotic fungus as a food source in specialized combs. Termites have developed several strategies to combat invading fungi species, which can be life-threatening to the insect colony. Especially defensive symbionts support the homeostasis of the colony by secretion of selective antimicrobial and antifungal products.





termite mount





*Termitomyces* sp.



## Natural Products of Microbial Symbionts of *Hydractinia*

Natural products present in bacterial biofilm induce morphogenesis of larvae of the marine hydroid polyp *Hydractinia echinata*.



pure isolates of marine bacteria



*Pseudoalteromonas* sp.

