The multitude of distinct niches that prevail in the marine environment has facilitated the development of very diverse marine microbiomes. This diversity is, naturally, reflected in their biochemistry and secondary metabolites and, hence, marine microbes represent a virtually untapped source of new bioactive compounds. The *Roseobacter* clade of marine α-proteobacteria represents some of the most abundant organisms in the marine environment and they may constitute as much as 20–30% of the prokaryotic community during algal blooms. Often, they exhibit traits suggestive of a lifestyle in close association with phytoplankton; including traits related to surface colonization, iron scavenging, and the production of bioactive secondary metabolites. Despite the fact that relatively few bioactive compounds have been identified in the α-proteobacteria, the roseobacters are known to produce compounds capable of stimulating algae growth, i.e. auxins, and algaecidal compounds, i.e. the roseobacticides. In addition, the roseobacters can produce a range of antibacterial products, such as the small tropolone compound tropodithietic acid (TDA) and the nonribosomal peptide indigoidine. TDA targets a broad spectrum of Gram-positive and Gram-negative bacteria in which resistance towards the compound does not arise easily. Mining the genomes of roseobacters also reveal that they are likely capable of producing other compounds than hitherto discovered by classical bio-assay guided fractionation, since the genomes contain genes/gene clusters probably encoding unknown bioactive secondary metabolites. Therefore, bacteria of the Roseobacter clade may serve as potential sources of novel bioactive compounds, including novel antibiotics, which is of paramount importance in the battle against antibiotic resistant pathogenic bacteria.

The discovery of new antibiotic compounds is not the only means by which we can counter the spread of antibiotic resistance. Development of sustainable alternatives to the application of antibiotics in agri- and aquaculture may be equally important. Attributable to their inherent properties, the roseobacters may be such an alternative in the aquaculture industry. Especially at the younger stages in larviculture, disease outbreaks caused by fish pathogenic microorganisms may lead to mortality rates of 100% when antibiotic treatment is not initiated. Adding roseobacters as probiotics is promising as fish larvae challenged with fish pathogens of the genus *Vibrio* exhibit survival rates similar to, or better than, unchallenged larvae when roseobacter probionts are added. Thus, the Roseobacter clade is a promising source of new bioactive compounds and a possible sustainable alternative to the prophylactic administration of antibiotics in fish rearing.