

**海綿から発見される多彩な化合物の真の生産者**

海の家綿から、化学構造の多様性に富み、様々な生物活性を示す天然有機化合物が発見されている。これらの化合物は、海綿に共生する微生物が生産するであろうと考えられているが、共生微生物の培養が難しいため、その詳細は長年の謎であった。今回紹介する研究ではシングルセルゲノミクスとメタゲノミクスを駆使することで海綿の共生微生物が数多くの化合物を生産している真の生産者であることを遺伝子レベルで明らかにしたので紹介する。

**紹介論文****An environmental bacterial taxon with a large and distinct metabolic repertoire**

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**Abstract**

Cultivated bacteria such as actinomycetes are a highly useful source of biomedically important natural products. However, such ‘talented’ producers represent only a minute fraction of the entire, mostly uncultivated, prokaryotic diversity. The uncultured majority is generally perceived as a large, untapped resource of new drug candidates, but so far it is unknown whether taxa containing talented bacteria indeed exist. Here we report the single-cell- and metagenomics-based discovery of such producers. Two phylotypes of the candidate genus ‘Entotheonella’ with genomes of greater than 9 megabases and multiple, distinct biosynthetic gene clusters co-inhabit the chemically and microbially rich marine sponge *Theonella swinhoei*. Almost all bioactive polyketides and peptides known from this animal were attributed to a single phylotype. ‘Entotheonella’ spp. are widely distributed in sponges and belong to an environmental taxon proposed here as candidate phylum ‘Tectomicrobia’. The pronounced bioactivities and chemical uniqueness of ‘Entotheonella’ compounds provide significant opportunities for ecological studies and drug discovery.

**Reference**

A talented genus.

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