



Winners of the 2021 JA Ōmura Awards for excellence

Richard E. Lee¹ · Minoru Yoshida^{2,3}

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The Editorial Board of *The Journal of Antibiotics* has given the 2021 JA Ōmura Award for an original article to an outstanding paper entitled “Discovery of ‘heat shock metabolites’ produced by thermotolerant actinomycetes in high-temperature culture” by Shun Saito, Wataru Kato, Hiroaki Ikeda, Yohei Katsuyama, Yasuo Ohnishi, and Masaya Imoto [1]. In their study, the authors explore a new approach to natural product drug discovery. Over the past 50 years, about 30,000 natural products have been discovered, contributing significantly to drug discovery and chemical biology. However, the discovery rate of new compounds has decreased over recent years, leading to the withdrawal of many pharmaceutical companies from natural product drug discovery. The expansion of microbial genomic data has revealed secondary metabolite gene clusters far exceeding the number of natural products discovered, suggesting a large proportion of the biosynthetic gene clusters are dormant under normal laboratory culture conditions. Saito et al. found a simple but effective method for activating such dormant genes by collecting thermotolerant strains from their library of actinomycetes and culturing them at 45 °C. They purified the compounds from the 45 °C cultures and determined their structures, which they named heat shock metabolites (HSMs). From 18 randomly selected thermotolerant actinomycete cultures, the authors identified 131 HSMs. Among the HSMs was an

unusual new cholic acid derivative named murecholamide. We anticipate this innovative method for secondary metabolite production will provide more opportunities to discover new natural products from otherwise dormant gene clusters.

The 2021 winner of the JA Ōmura Award for original review article goes to an outstanding review entitled “Role of symbiosis in the discovery of novel antibiotics” by Vedanjali Gogineni, Xiaoyan Chen, George Hanna, Dian Mayasari, and Mark T. Hamann [2]. The study examines the promise of using symbiotic organisms to discover new antibiotics. Symbiotic microorganisms live with plants, animals, or other microorganisms in a mutually beneficial way, often aided by the production of secondary metabolites from the symbiotic microorganism. We can now use an understanding of ecological relationships between the host and symbiont to help antibiotic discovery. Examples discussed in the review include microbes associated with plants and sponges that protect their host from predation and infection. This strategy is of particular benefit for slow-growing host organisms such as trees and sponges. Marine sponges are highlighted as remarkable sources of novel chemistry, with a large proportion of their dry weight derived from endosymbiotic bacteria or fungi. The review provides examples of the great diversity of chemical matter obtained from symbionts, including marine microbes associated with marine invertebrates and sponges, marine actinobacteria, and plant symbionts. Challenges to exploiting symbionts are also discussed, including growing the symbiont away from host organisms and obtaining good secondary metabolite production. Recent advances in co-culture techniques, and the application of metagenomics to identify and heterologously express novel biosynthetic gene clusters are examined to address these challenges. Screening of symbiotic microbes is still largely untapped and offers much future promise for antibiotic discovery. The review is recommended to those interested in the role of symbiosis in antibiotic and secondary metabolite production and the discovery of novel antibiotic substances from organisms that occupy unique microbiological niches.

✉ Richard E. Lee
Richard.Lee@stjude.org

✉ Minoru Yoshida
yoshidam@riken.jp

¹ Department of Chemical Biology and Therapeutics, St. Jude Children’s Research Hospital, Memphis, TN, USA

² RIKEN Center for Sustainable Resource Science, Wako, Saitama, Japan

³ Department of Biotechnology, The University of Tokyo, Tokyo, Japan

Compliance with ethical standards

Conflict of interest The authors declare no competing interests.

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References

1. Saito S, Kato W, Ikeda H, Katsuyama Y, Ohnishi Y, Imoto M. Discovery of "heat shock metabolites" produced by thermotolerant actinomycetes in high-temperature culture. *J Antibiot.* 2020;73:203–10.
2. Gogineni V, Chen X, Hanna G, Mayasari D, Hamann MT. Role of symbiosis in the discovery of novel antibiotics. *J Antibiot.* 2020;73:490–503.

ABOUT THE WINNERS

The medal will be awarded to the first author of Original and Review article, and all of the authors will receive the certificates. Each first author's short biography is as follows.



Shun Saito

Original article Division: awardee Shun Saito Dr. Shun Saito is a chemical biologist specializing in the field of natural products chemistry. He received his BS (2012) in Sciences at Keio University and his PhD (2017) from Keio University under the supervision of Prof. Masaya Imoto. After postdoctoral research experiences with Prof. Yasuo Ohnishi at the University of Tokyo and with Prof. Yasuhiro Igarashi at Toyama Prefectural University, he joined the faculty of Science and Technology at Keio University in 2020 as an Assistant Professor. His present research focuses on drug discovery from natural product resources and development of activation methods of silent secondary metabolite biosynthetic genes in microbial strains. He is also interested in understanding the regulatory mechanism and the physiological function of secondary metabolites in microorganism.



W. Kato



H. Ikeda



Y. Katsuyama



Y. Ohnishi



M. Imoto



Vedanjali Gogineni

Review article Division: awardee Vedanjali Gogineni Dr Vedanjali Gogineni is a Scientist leading method development/method validation projects at Alcami Corporation, a US-based pharmaceutical contract development and manufacturing organization (CDMO). She also holds Affiliate Faculty (Affiliate Instructor) appointment with The Medical University of South Carolina. Dr Gogineni holds a PhD in Pharmaceutical Sciences with an emphasis in Medicinal Chemistry from the University of Mississippi. During her graduate studies, she was actively involved in the isolation, structural determination, and optimization of natural products with a focus on plants and marine sources. She worked on psychoactive medicinal plants for the treatment of neurological disorders. Prior to her admission into the doctoral program, she worked as a Research Scholar under the guidance of Dr. Mark T. Hamann and currently collaborates with him. Dr Gogineni has published about nine scientific papers/reviews, and a book chapter so far. Dr Gogineni has received several awards during her PhD including the 2016 American Chemical Society (ACS) Women Chemists Committee Travel Award sponsored by Eli Lilly & Company, the 2016 American Association of Pharmaceutical Scientists (AAPS) Graduate Student Research Award in Drug Discovery and Development Interface, and was a winner of Graduate Student Award in the Chemistry Research Category at the 2016 Sigma Xi Student Research Conference along with Nobles-Sam Award in Medicinal Chemistry which is considered as the highest award in the Department of BioMolecular Sciences, Division of Medicinal Chemistry, University of Mississippi. Dr Gogineni began her career in cGMP analytical department at Cambrex Pharmaceuticals in Charles City, Iowa.