

Biological and Chemical Diversity of Bacteria Associated with a Marine Flatworm

Hui-Na Lin^{1,2†}, Kai-Ling Wang^{1,3†}, Ze-Hong Wu^{4,5}, Ren-Mao Tian⁶, Guo-Zhu Liu⁷, Ying Xu^{1*}

¹Shenzhen Key Laboratory of Marine Bioresource & Eco-environmental Science, Shenzhen Engineering Laboratory for Marine Algal Biotechnology, College of Life Sciences and Oceanography, Shenzhen University, Shenzhen 518060, China; timaroona@163.com (H.-N.L.); kailingw@163.com (K.-L.W.)

²School of Life Sciences, Xiamen University, Xiamen 361102, China;

³ Key Laboratory of Marine Drugs, Ministry of Education of China, School of Medicine and Pharmacy, Ocean University of China, Qingdao 266003, China;

⁴The Eighth Affiliated Hospital, Sun Yat-sen University, Shenzhen, 518033, China;
wuzechong922@126.com

⁵Integrated Chinese and Western Medicine Postdoctoral research station, Jinan University, Guangzhou, 510632, China;

⁶Division of Life Science, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong SAR, China; tianrenmao@gmail.com

⁷HEC Research and Development Center, HEC Pharm Group, Dongguan 523871, China;
liuguozi@hecpahrm.com

† These authors contributed equally to this work.

* Author to whom correspondence should be addressed; E-mail: boxuying@szu.edu.cn; Tel.: +86-755-26958849; Fax: +86-755-26534274.

Supplementary Information

| | |
|--|---|
| Figure S1. ^1H -NMR(600 MHz) of 1 in CDCl_3 | 2 |
| Figure S2. ^{13}C -NMR(150 MHz) of 1 in CDCl_3 | 2 |
| Figure S3. DEPT 135 (150 MHz) of 1 in CDCl_3 | 3 |
| Figure S4. COSY of 1 in CDCl_3 | 3 |
| Figure S5. HSQC of 1 in CDCl_3 | 4 |
| Figure S6. HMBC of 1 in CDCl_3 | 4 |
| Figure S7. NOESY of 1 in CDCl_3 | 5 |
| Figure S8. High resolution electrospray ionization mass spectroscopy (HR-ESI-MS) spectrum of 1 | 5 |
| Figure S9. The chemical structure of actinomycin D | 6 |
| Figure S10. The other geldanamycins (GMs) trace of XY-FW47 in ultra-performance liquid chromatography-mass spectrometry (UPLC-MS) (HR-ESI-MS [M-H] ⁻ 547.2805 and 533.2992). | 6 |

Figure S1. ^1H -NMR(600 MHz) of **1** in CDCl_3 .

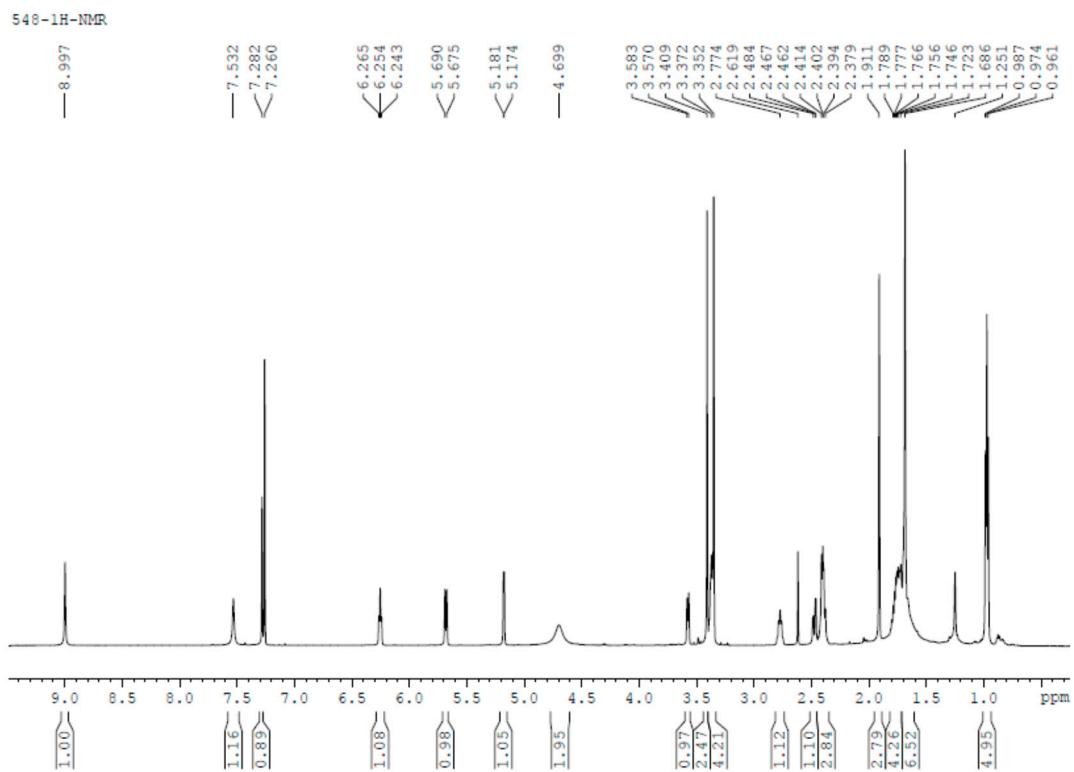


Figure S2. ^{13}C -NMR(150 MHz) of **1** in CDCl_3 .

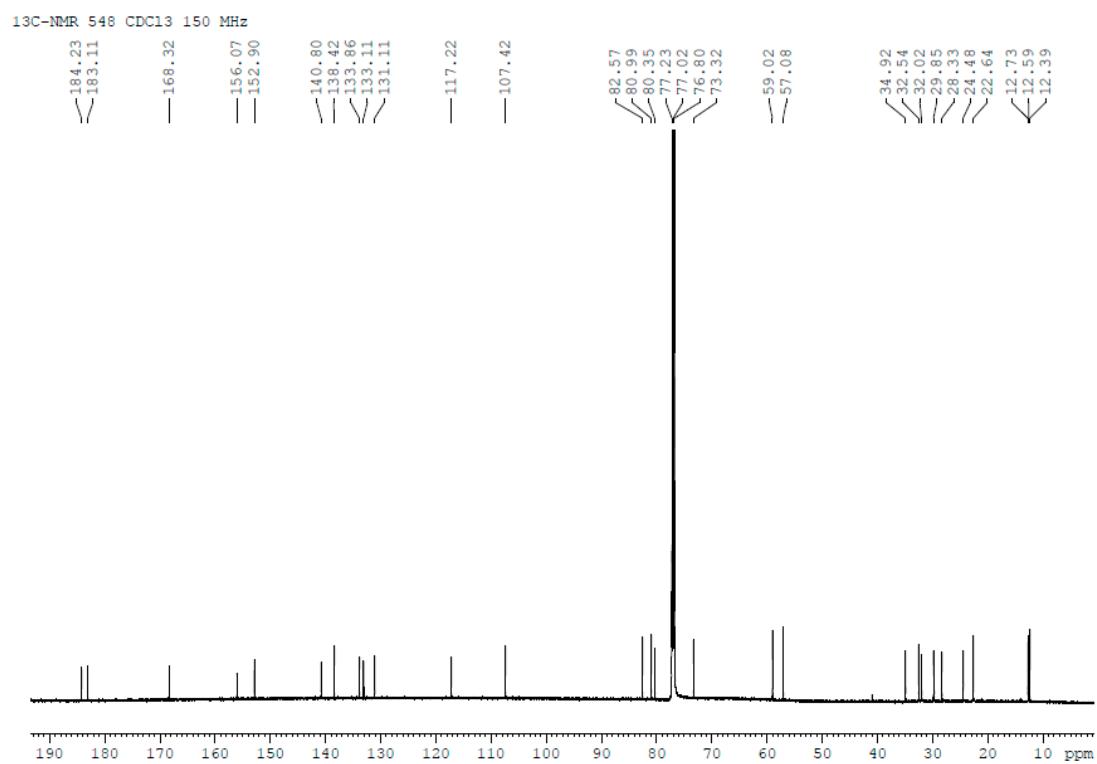


Figure S3. DEPT 135 (150 MHz) of **1** in CDCl_3 .

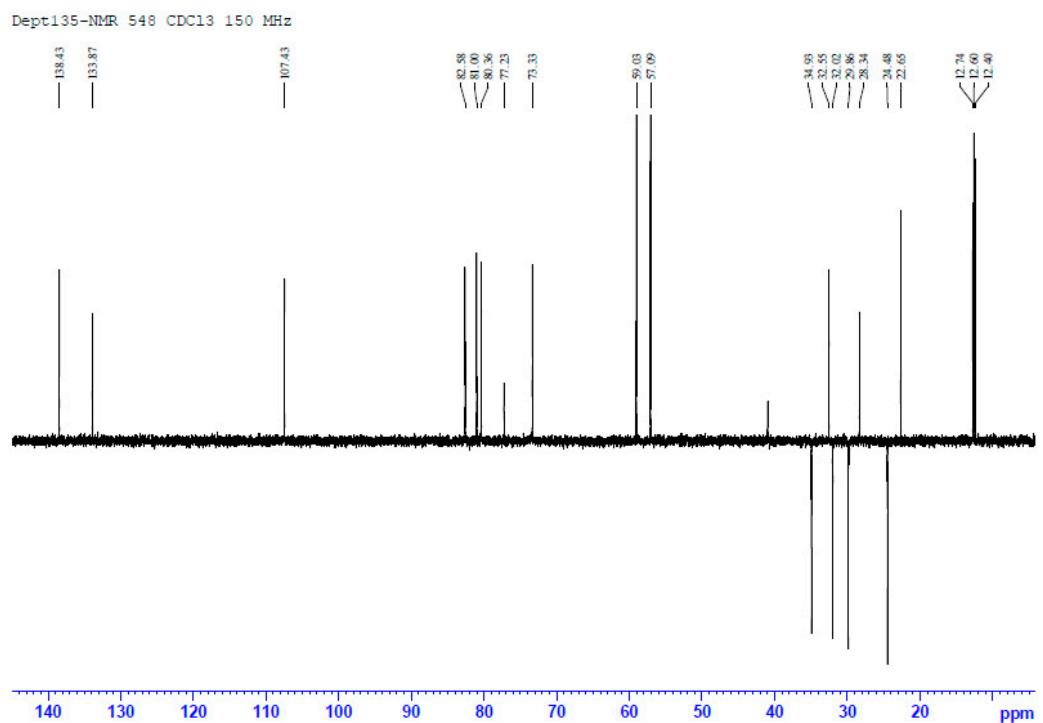


Figure S4. COSY of **1** in CDCl_3 .

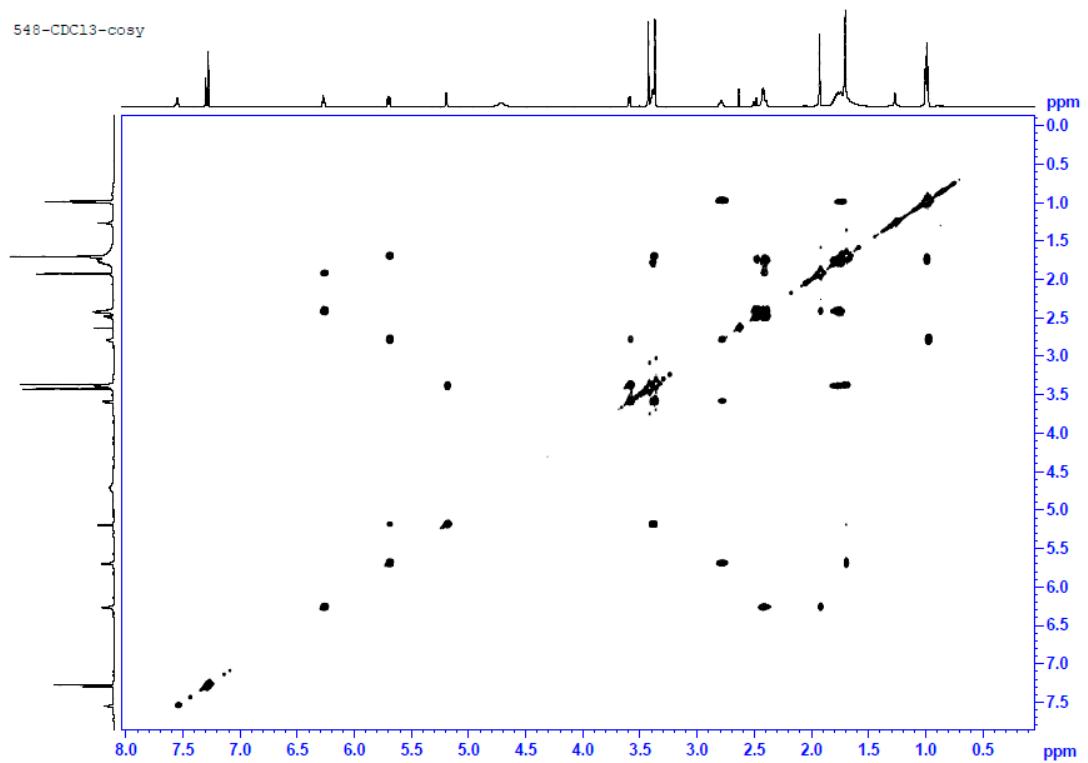


Figure S5. HSQC of **1** in CDCl_3 .

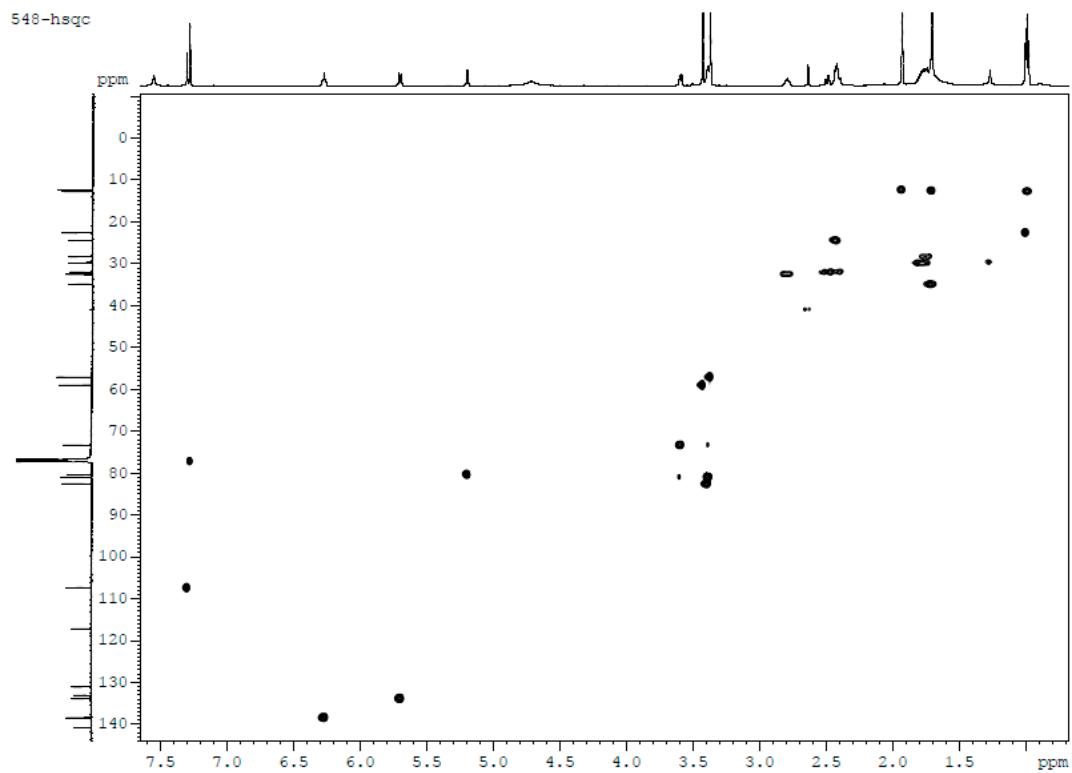


Figure S6. HMBC of **1** in CDCl_3 .

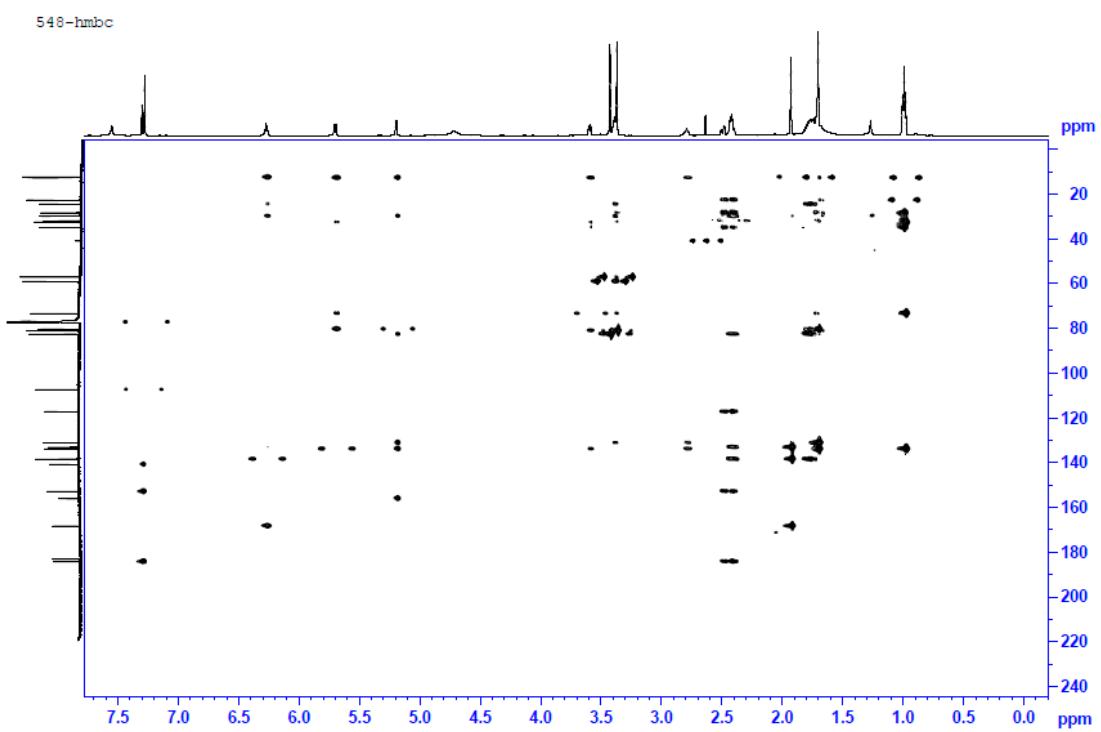


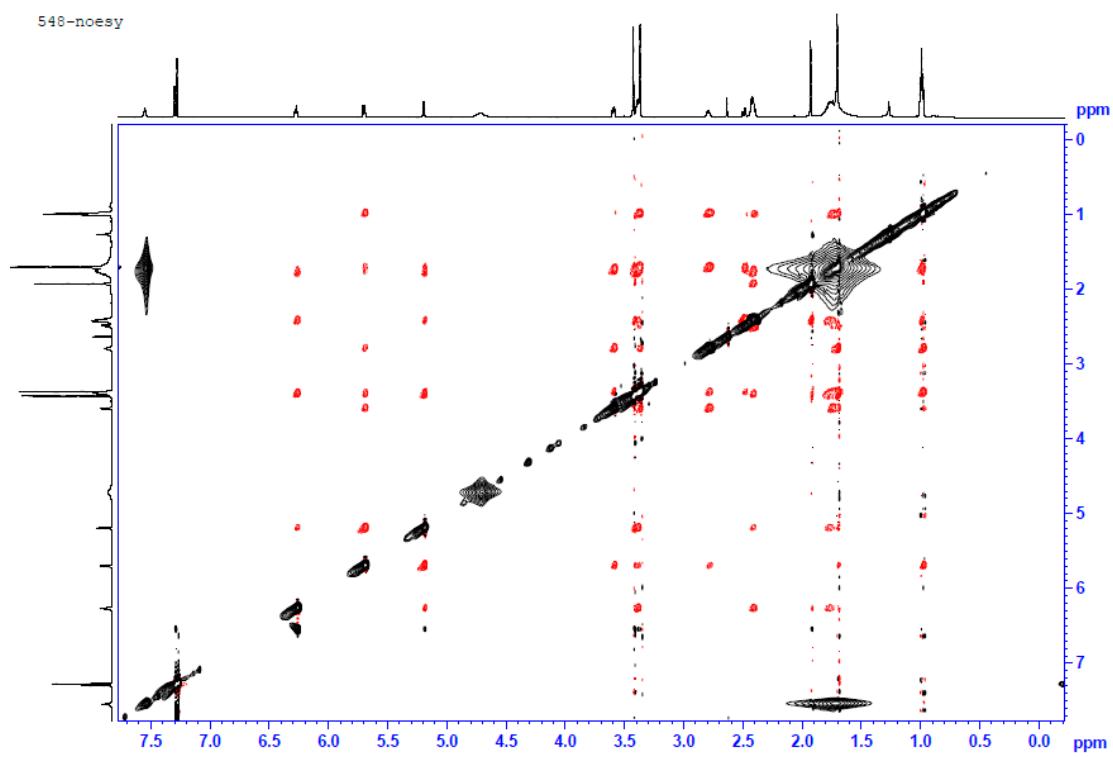
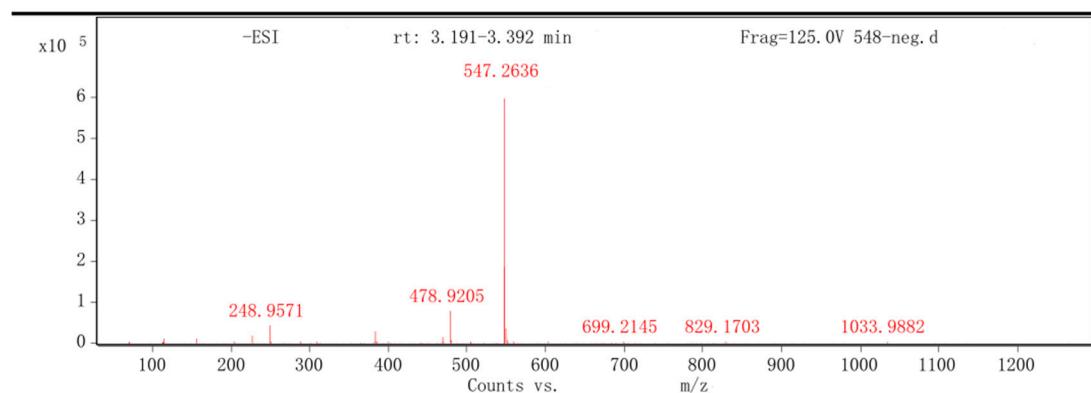
Figure S7. NOESY of **1** in CDCl_3 .**Figure S8.** High resolution electrospray ionization mass spectroscopy (HR-ESI-MS) spectrum of **1**.

Figure S9. The chemical structure of actinomycin D

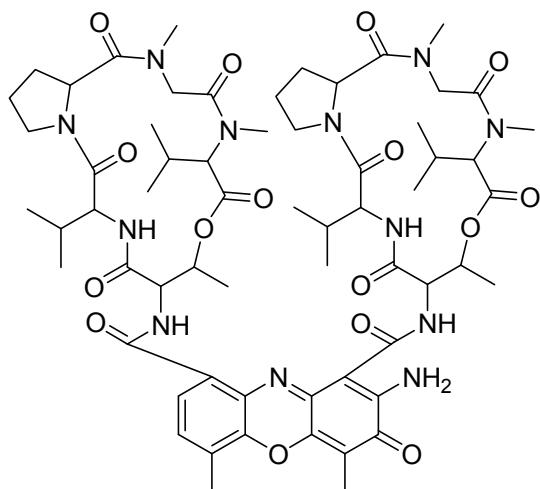


Figure S10. The other geldanamycins (GMs) trace of XY-FW47 in ultra-performance liquid chromatography–mass spectrometry (UPLC-MS) (HR-ESI-MS $[M-H]^-$ 547.2805 and 533.2992).

