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Author: Hua Zhu
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Environmental and Metabolomic Study of Antibiotic Production by Actinomycetes

1. Actinomycetes can be efficiently enriched from soil samples by combining pretreatment techniques with appropriate nutrient media supplemented with antibacterial and antifungal agents (this thesis).

2. A large proportion of newly isolated actinomycetes can be activated by specific growth conditions to produce antibiotics with efficacy against MDR pathogens that threaten the health of patients in the clinic worldwide (this thesis).

3. In combination with different multivariate data analysis techniques, NMR-based metabolomics is an excellent tool for targeting new antibiotics and for dereplicating non-active compounds in actinomycetes (this thesis).

4. Volatile organic compounds (VOCs) should be incorporated in traditional drug discovery, whereby the synergistic effect of VOCs with other antibiotics is a particularly promising line of research (this thesis).


6. There is no better experimental support for Charles Darwin’s statement that “It is not the strongest of species that survive, nor the most intelligent, but the ones most responsive to change”, than the rapid emergence of antibiotic resistance in bacteria (Darwin, C.R. (1859), “On the origin of species by means of natural selection, or the preservation of favoured races in the

7. As documented in Tao Te Ching (道德经), which states that “All things on earth mutually reinforce and neutralize each other”, we should keep searching in nature for the solution as there must be something that can neutralize the spreading of notorious pathogens.

8. As an analogy, NMR is like a mother: sometimes insensitive but generally doesn’t lie; mass spectrometry is more like a lover: it lies all the time but tells lies you want to hear. The trick is to turn LC-MS into a trusted partner, through the use of high quality controls (Inspired by Ian Wilson).

9. In order to specialize in one discipline, it is necessary to obtain multidisciplinary knowledge.

10. Cultural differences require that Asian students should not only prepare themselves scientifically but also mentally before coming to Europe.

Hua Zhu
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