

Title: Construction of a Texas Microbes-Derived New Natural Product Library for Novel Drug Discovery

Natural products are a rich source of compounds for drug discovery and this remains true today. Although pharmaceutical companies have minimized natural product research, natural products possess enormous structural and chemical diversity that cannot be matched by any synthetic libraries. A detailed study conducted by the US Food and Drug Administration (FDA) shows that 34% of new medicines were natural products or direct derivatives of natural products¹. Challenges of natural product-based drug discovery include extremely low yields, limited supply, and complex structures posing great difficulty for structural modifications. Microorganisms, including fungi and bacteria, are prolific producers of diverse natural products. We hypothesized that the vast and diverse biogeographic territory of the State of Texas harbors abundant and underexplored microbial species from which new and useful natural products can be discovered as drugs and lead compounds. In this study, bacterial and fungal samples isolated from various Texas soil samples were fermented in relatively large volume and then extracted with methanol (MeOH) and ethyl acetate (EtoAc), respectively. Crude extracts from each isolate were fractionated using flash performance liquid chromatography (FPLC). The fractions are then sorted into a new natural product library, which will be screened through collaborations for anticancer, antimicrobial, and anti-parasitic activities. Future implications of this research could yield new drugs that are effective against cancer or other categories of human disease.

Keywords: natural products, bacteria, fungi, drug discovery

1. Newman, D.J. & Cragg, G.M. Natural products as sources of new drugs over the 30 years from 1981 to 2010. *J. Nat. Prod.* **75**, 311-335 (2012).