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Using Cave Bacteria to Inhibit *Pseudogymnoascus destructans*, the White Nose Pathogen

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Pseudogymnoascus destructans, the causative fungus of White Nose Syndrome (WNS), has rapidly spread across North America, endangering many species of bats through accelerating their use of stored fuels during hibernation. Bats diagnosed with WNS have faced greater than 90% mortality in caves. In hopes of controlling this fungus, we screened cave bacteria for antifungal compounds inhibitory to *P. destructans*. Actinomycetes, a widely-distributed family of filamentous bacteria, have a long history of producing antibiotics. They have been known to synthesize a great variety of our current day antibiotics and serve as an important discovery platform for new antibiotics. With this reasoning, we performed enrichments to isolate cave actinomycetes, amassing a library of over 500 individual strains. To screen for antibiotic activity, we tested organic extracts from spent culture media against the yeast *Saccharomyces cerevisiae* and *P. destructans*. Extracts giving the strongest inhibition were subjected to further analysis by mass spectrometry (MS), chromatography (HPLC) and additional bioassays. Additionally, we are collaborating with the Doering Lab (WUSM) to screen our extracts against *Cryptococcus neoformans,* a facultative intracellular pathogen that causes severe brain and lung infections in humans. Within our library, we discovered 56 actinomycetes that have pronounced antifungal activity. Broadly, we found some are active against all three indicator organisms, while others were more selective against *P. destructans*. These studies are foundational towards identifying specific antibiotic compounds and strains for the environmental control of WNS.