

## *Antibiotic-producing soil streptomycetes in Jordan and UAE serving as groundwork for pharmaceutical industry*

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### *Abstract*

Microbial infections have been recognized as an important problem due to the emergence of resistant strains to multiple antibiotics. Therefore, there remains a need to find new antibiotics with a broad spectrum of activity. One of these approaches is to expand the screening activity of the genus *Streptomyces* as it harbors great numbers of antibiotic producers. Several studies on the isolation, characterization and genotyping of soil streptomycetes of Jordan and UAE have already been conducted and the *in vitro* activity of the recovered isolates has been explored towards several multi-resistant pathogens. The optimal production conditions for the active substances by the most active *Streptomyces* strains as well as their extraction and purification were also investigated. Whole genome sequencing using illumina was performed on the strains isolated from the UAE region. Investigations revealed the identification of an antibiotic-producing *Streptomyces* strains to inhibit all tested organisms with the observation of different Rf values and UV absorption spectra of the active substances from some tested drugs. No low molecular weight plasmids were detected in these strains suggesting that their antibiotic production is likely chromosomally encoded DNA. PCR amplification of a genus-specific sequence in the *Streptomyces*' 16S rDNA gene allowed the rapid and direct detection of streptomycin-producing *Streptomyces* species from soil. Whole genome sequencing showed that strains shared distinct, but related, phyletic lines with other *Streptomyces* species. AntiSMASH analysis identified many biosynthetic gene clusters (BGCs) with antimicrobial properties. The fact that these *Streptomyces* strains showed antibiotic activity towards all the tested pathogens were recovered from dried underexplored habitats in Jordan and UAE with harsh environmental conditions may support the idea of producing novel antibiotics under such conditions. All laboratory screenings for *Streptomyces*-producing antibiotics would serve as groundwork for the bio-industry.



### *Biography:*

Prof. I. Saadoun has received his PhD. in Microbiology from Auburn University, Alabama-USA in 1995. During his PhD, he worked on physiology and genetics of production of off-flavor compounds by streptomycetes and cyanobacteria. Prof. Saadoun has published several scientific papers in different refereed and indexed Journals. Most of these papers were in the area of inhibitory/metabolites-producing *Streptomyces* spp. Also he has participated in several local, regional and international meetings to present his work.

### *Speaker Publications:*

1. Saadoun I, Alawawdeh M (2019) Analysis for *Streptomyces* spp. recovered from oil refinery soils to grow on diesel. Malaysian Journal of Microbiology 15(6): 480-487.
2. Saadoun I, Ananbeh H, Ababneh Q, Jaradat Z (2017) Comparative distribution of soil *Streptomyces* flora in different Jordanian habitats and their enzymatic and antibiotic activities. Research Journal of Pharmaceutical, Biological and Chemical Sciences 8(2): 1285-1297



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