

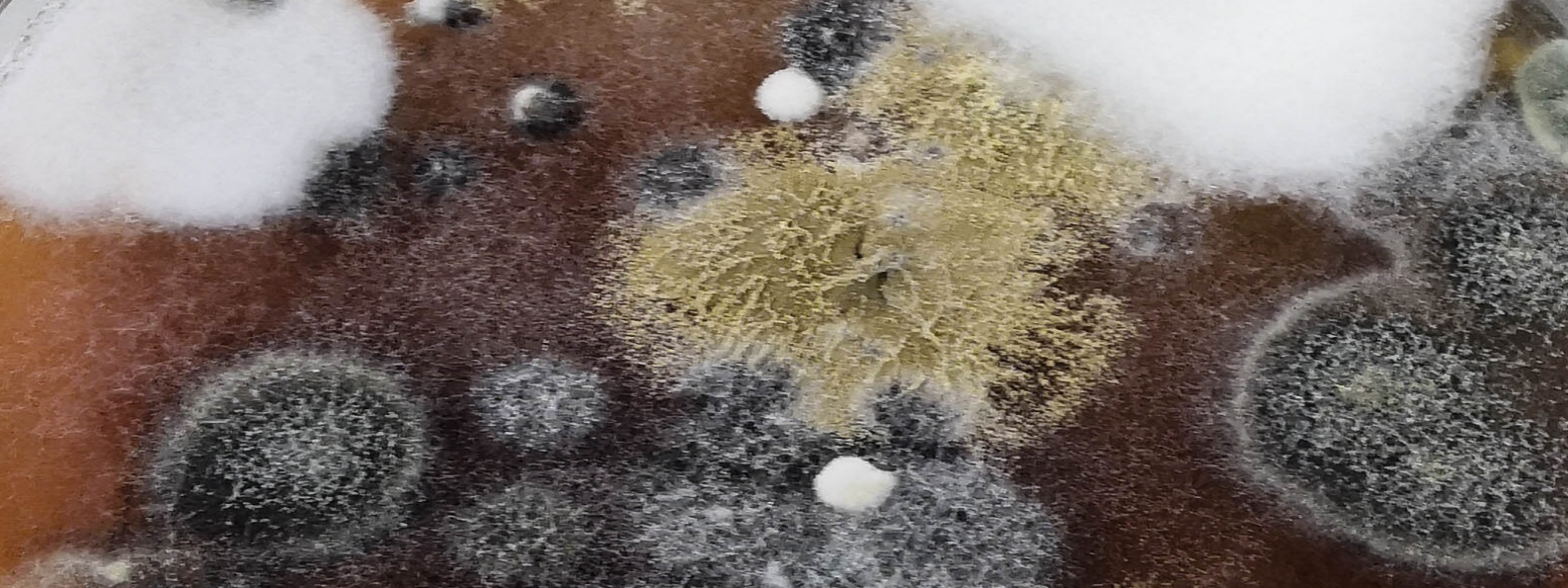
# Soils for Science

## ANTIBIOTICS DOWNUNDER

A citizen science initiative designed to engage the public in the sampling of Australian soils, to help discover new and improved natural product antibiotics.



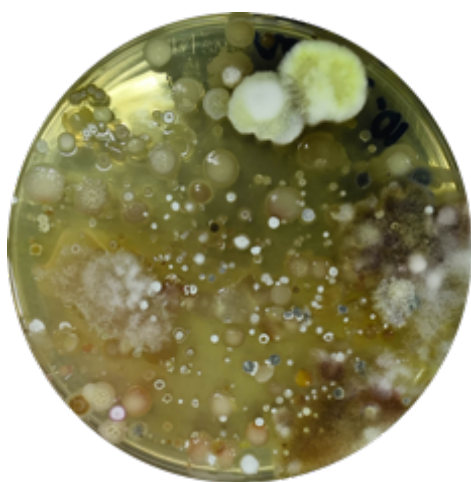




## The Vision

SOILS FOR SCIENCE will deliver a national citizen science program, that will facilitate the collection of tens of thousands of backyard soil samples from across Australia.

SOILS FOR SCIENCE will inform and educate the public on the importance of antibiotics and antibiotic resistance in modern healthcare, while simultaneously enabling the search for new and improved antibiotics.



backyard soil isolation plate

The antibiotics revolution that commenced early last century with the discovery of penicillin, heralded a golden age in healthcare. For the first time in human history infectious diseases were no longer a death sentence. In the decades that followed, hundreds of millions (even billions) of people worldwide benefited from ready access to antibiotics, the majority of which were derived from chemicals produced by soil microbes. These soil-inspired discoveries sparked a revolution in global science, healthcare and commerce, delivering a profound social benefit, raising quality of life, and life expectancy, to unprecedented levels.

Sadly, in recent years the protection offered by antibiotics has waned. Lack of and/or inappropriate investment has seen very few new antibiotics come to the market, while escalating levels of antibiotic resistance have undermined what few vintage antibiotics are left.

**FUNGAL INFECTION.** Globally over 300 million people are afflicted with a serious fungal infection, 25 million are at high risk of dying, 1.6-2.5 million die, and over 1 million are left blind. Illustrative of the threat, the highly infectious fungal superbug *Candida auris* causes serious bloodstream infection, particularly in hospitals and nursing home patients, with only a 1 in 3 chance of survival. Of concern, the first *Candida auris* infection was reported in Australia in 2019.

**BACTERIAL INFECTION.** In the US alone, antibiotic resistant bacteria cause 2 million infections and >23,000 deaths per year, at an estimated economic impact of USD55-70B, while deaths in Europe are estimated at 33,000, and globally at over 1 million per year. Deaths due to antibiotic resistant bacteria in Australia, are higher today than a decade ago.

Antibiotic resistance has been identified as one of the biggest public health challenges of our time. There is an urgent need to discover new antibiotics.

SOILS for SCIENCE working in coordination with MICROBES AUSTRALIA (see separate flyer) will provide Australian home and land owners, schools, community, social and sporting groups and others, with educational material on antibiotics and antibiotic discovery through a website and mobile APP, and soil sampling kit. The public will collect and return soils to The University of Queensland where they will be applied to agar plates to reveal backyard bacteria and fungi (see image opposite). All isolated microbes will be submitted to MICROBES AUSTRALIA where they will be cryopreserved, and subjected to taxonomic, genomic, chemical and antibiotic profiling. Promising leads will be prioritized for detailed investigation by Australian based researchers, to discover new antibiotics.

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