

TALL POPPY CAMPAIGN

Investing in Australia's Future

Young Tall Poppy Profile: Assoc Prof Ian Anderson

Name: Ian Anderson

Title (ie. Dr, Assoc Prof, etc): Assoc Prof

Research Field: Microbiology

More Specifically: Molecular Microbial Ecology

In other words: Using DNA based techniques to investigate the diversity and ecology of soil microbes

Abbreviated Qualifications: Bachelor of Science (1st Class Honours), PhD (Microbial ecology)

Current position: Associate Professor

University/Institution: University of Western Sydney

What do you do?

Ian uses DNA fingerprinting, along with other molecular biology techniques, to characterize and understand the biodiversity of soil microbes (particularly fungi). Fungi have long thin filaments (mycelia) that penetrate vast volumes of soil, and some species form beneficial (symbiotic) associations with tree roots from which they acquire most of their carbon for growth. Ian is particularly interested in how these microorganisms will respond to future climate change and the role these organisms will have in increasing forest soil carbon storage.

Why is this research important? How is it relevant to society at large?

Soils, and the microbes contained within them, have the ability to store large amounts of carbon and are therefore key components of how forest ecosystems will respond to future climate change. At present, a major impediment to accurate carbon accounting in Australia is estimating the amount of carbon sequestered in forest soils and the role of soil microbes in this process. Ian's research aims to quantify the importance of microbes in this process. This will provide critical new information to improve carbon accounting for current and future emissions trading schemes.

What's difficult about it?

Studying soil microbes is tremendously difficult because they are small, difficult to grow in a laboratory, live below-ground and we know very little about their diversity. The only way of being able to truly assess their diversity is through the use of state-of-the-art DNA fingerprinting and other molecular biology techniques.

Why are you passionate about it?

Being able to use molecular biology techniques to find out the unknown and see a wealth of diversity that can't be seen with human eyes is amazing. We often think of soil as something we walk on or grow plants in but it is one of the most diverse ecosystems that exists, and in the context of climate change, is extremely important in carbon storage. Therefore, unraveling this diversity, along with understanding the function of soil microbes in key ecosystem processes, will allow us to understand the role of soil and soil microbes in forest ecosystem responses to future climate change.

Why share your research with high school students?

Conducting scientific research to find out something completely new that no one has shown before is exciting. This element of excitement does not often come through in learning about biology from a textbook. I hope students will be able to see both the element of excitement but also the relevance of my research to climate change which is constantly being talked about in today's media.

Why study sciences?

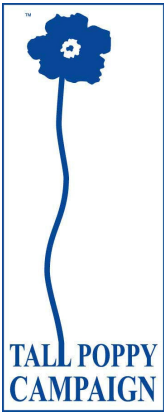
We are surrounded by science in society and we all rely on scientific advances to improve or maintain our quality of life whether through development of the bionic ear, finding a cure for cancer, stopping some of our unique native species from going extinct, or finding new clean ways of harnessing energy from the environment to reduce our reliance on fossil fuels. Studying science helps understand all of these things better but also provides an opportunity for those who choose to have a scientific career to make a difference in society.

Founded by the Australian Institute of Policy and Science

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**Is it what you've always wanted to do?**

No. I wasn't sure what I wanted to do after high school and it wasn't until I started studying biology at university (since I studied physics and chemistry at high school) that I became totally intrigued with wanting to understand all about DNA and molecular biology as well as how organisms and ecosystems function.

What else are you into?

Relaxing with family, bush walking and tennis.

Public profile

Ian has given talks at many scientific conferences as well as numerous public science, and youth, education events both in Australia and the UK. Specifically, he has given talks to community groups, politicians, biodiversity management forums and youth science education forums. He has also appeared on the former ABC television science program Quantum.

Your achievements - How did you get where you are today?**Your HSC subjects:**

3 unit Maths, 2 unit Chemistry, 2 unit Physics, 2 unit General English, 2 unit Economics, 1 unit General Studies

Degrees:

Bachelor of Science (1st Class Honours), PhD (Microbial ecology)

Some of your previous position/s:

Senior Research Scientist, The Macaulay Institute, Aberdeen, Scotland, UK.

Research Scientist, The Macaulay Institute, Aberdeen, Scotland, UK.

Postdoctoral Research Scientist, Aberdeen University & The Macaulay Institute, Aberdeen, Scotland, UK.

Current position:

Associate Professor, University of Western Sydney

Relevant awards and prizes you have received as part of your studies/research/work:

Ian's research has been funded via the award of over \$2.4M in competitive funding. He has also received numerous awards and prizes including an Australian Postgraduate Research Award and a prestigious Life Sciences Research Award from the NSW Office for Science and Medical Research.

Summary of published works:

Ian has published over 40 scientific journal articles in leading international journals as well as two book chapters. He also serves on the editorial board of the international journal *FEMS Microbiology Ecology*.

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