Abstract

We have used enzymes for thousands of years, but it is only in the last few decades that we have had the capability to engineer our own enzymes and expand on nature's biocatalytic repertoire. Now, as we enter the age of synthetic biology, and the applications of protein-based technologies expand, we need to move beyond enzyme active sites and establish a more holistic understanding of proteins. In this lecture I will describe some of the research we have been undertaking in this space, with a particular focus on the computational tools we have been using to gain insights into the relationship between protein structure and function. I will show examples of how these tools have been used to improve the properties of biocatalysts and also discuss a more recent project that aims to develop a novel biosensor to study protein production in real time.

Biography

Dr Matthew Wilding began his research career in Manchester, UK where he completed a PhD in Biological Chemistry with Prof. Jason Micklefield. Shortly after (2012) he moved to CSIRO to do a postdoc, developing enzymatic routes to bionylon with Colin Scott and was there promoted to Research Scientist. In 2017, he was awarded a CSIRO Synthetic Biology Fellowship and ultimately moved to the ANU to work on Orthogonal Translation Machinery, which he will talk about to some extent in the lecture.