Major Grants for funding commencing in 2015

Examples of Victorian Discovery Early Career Researcher Award projects

Victorian (VIC) research organisations will receive more than $17.5 million through the Australian Research Council DECRA scheme for 50 new research projects commencing in 2015.

Some examples of the VIC projects are provided below.

To view the summaries of all successful projects, visit the ARC announcements page.

La Trobe University
**DECRA Recipient:** Dr Sarah Hayes (DE150101203)
**Summary:** Victoria's 19th century gold rush triggered a major social and economic transformation with far ranging consequences. This project aims to investigate how individuals responded and contributed to this transformation over their life course, and how this moulded current values around quality of life in Australia. The project also aims to develop a pioneering approach that will integrate historical and archaeological evidence on individual, site, neighbourhood, city and global levels in new ways. Fresh social histories of Melbourne and Bendigo will be generated, which reinforce national identity and have implications for understanding the impact of the current mining boom on individuals.

**ARC funding:** $323 189

Swinburne University of Technology
**DECRA Recipient:** Dr Xiangping Li (DE150101665)
**Summary:** To tackle the capacity bottleneck of current big data centres enabled by hard disk drives, this project aims to investigate an entirely new concept of petabyte 3D opto-magnetic data storage by nanophotonic engineering of the Inverse Faraday Effect (IFE) based on breakthrough achievements in 3D orientation-unlimited polarisation control and the innovative discovery of the polarisation dependent IFE. This project aims to produce cutting-edge opto-magnetic information technologies to revolutionise magnetic storage industries and provide a new paradigm of exabyte data centres for a sustainable future, thereby maximising Australia's competitive advantage in the emerging big data sector.

**ARC funding:** $345 000

RMIT University
**DECRA Recipient:** Dr Yolande Strengers (DE150100278)
**Summary:** Home automation technologies are expected to achieve reductions in household energy costs and consumption. However, there has been no systematic investigation of the ways in which they are being incorporated into everyday life. The project aims to address this critical gap in relation to home cooling. It will investigate how automated cooling technologies are being incorporated into household practices in Australia, and the expectations they promote, sustain and transform. The project also aims to produce important new knowledge about how to study and understand the effects of ambient and automated technologies in everyday life and their potential impact on energy consumption.

**ARC funding:** $370 000
Deakin University  
**DECRA Recipient:** Dr Severine Lamon (DE150100538)  
**Summary:** Skeletal muscle is the largest organ in the body and plays a vital role in maintaining independent living and social interaction. As it ages, skeletal muscle loses its ability to build up new muscle proteins. However, the principles underlying the biology of skeletal muscle ageing are not well understood. MicroRNAs (MiRNAs) are essential regulators of skeletal muscle biology. Whether they play a role in the ageing process and how they regulate muscle protein synthesis as we age has not been investigated. This project aims to identify the MiRNA species involved in muscle protein synthesis and will provide a better understanding of the biology of ageing skeletal muscle.  
**ARC funding:** $342 000

Monash University  
**DECRA Recipient:** Dr Matthew Hall (DE150100327)  
**Summary:** Males and females experience the burden of infection differently. Males are typically thought of as the 'sicker sex', favouring investment in costly sexual displays, at the expense of immune function. But what does this mean for the pathogen? Each sex presents a unique set of challenges that an invading organism must overcome; yet the impact of these differences on pathogen evolution has been surprisingly overlooked. This project aims to unravel how sex-specific challenges influence the outcome of pathogen evolution. This work will show how infection in males or females can alter the evolutionary potential of disease, and will ask whether same-sex populations could ever lead to the evolution of new pathogen strains and virulence genes.  
**ARC funding:** $378 000

The University of Melbourne  
**DECRA Recipient:** Dr Simon Illingworth (DE150100161)  
**Summary:** Wall turbulence is a critically important phenomenon for any system where fluid flows past an object. Wall turbulence is responsible for 90 per cent of the drag experienced by a large crude tanker, to give just one example. This project aims to investigate novel ways to control wall turbulence by exploiting the presence of recently-discovered large-scale structures. This will lead to significant reductions in the drag and fuel burnt by transport vehicles.  
**ARC funding:** $375 000

Deakin University  
**DECRA Recipient:** Dr Lee Rollins (DE150101393)  
**Summary:** Although invasive species are a massive threat to biodiversity, and costly to society, we still do not understand the evolutionary processes that shape invasions. Invasive populations often show rapid evolutionary change in novel environments but attempts to identify the underlying genetic mechanisms have been largely unsuccessful. This project aims to explore an innovative and untested alternative possibility: that invader evolution is primarily driven by epigenetic change. Using an iconic Australian invasive species, the cane toad, the project aims to quantify genetic and epigenetic change across the invasion and use manipulative experiments to determine the influence of epigenetic change on the evolution of phenotypic traits important to invasion.  
**ARC funding:** $360 000