



'Tiresome ticks: Ecology and transmission of tick-borne disease in Australia'

Administering Organisation: Murdoch University

Investigators:

1	Prof Peter Irwin	<input type="text" value="Chief Investigator"/>	Murdoch University	Murdoch University
2	Prof Una Ryan	<input type="text" value="Chief Investigator"/>	Murdoch University	Murdoch University
3	Dr Charlotte Oskam	<input type="text"/>	Murdoch University	Murdoch University
4	Dr Liisa Ahlstrom	<input type="text" value="Partner Investigator"/>	Bayer Australia Ltd	Bayer Australia Ltd
5	A/Prof Peter Banks	<input type="text" value="Chief Investigator"/>	The University of Sydney	The University of Sydney
6	Prof Roy Hall	<input type="text" value="Chief Investigator"/>	The University of Queensland	The University of Queensland
7	Dr Sonja Hall-Mendelin	<input type="text" value="Partner Investigator"/>	Queensland Health Forensic And Scientific Services	Queensland Health
8	Dr Bettina Schunack	<input type="text" value="Partner Investigator"/>	Bayer Animal Health GmbH	Bayer HealthCare

Proposal Summary

Growing numbers of Australians are diagnosed with a Lyme disease-like illness, presumed to be tick-borne, yet a conclusive diagnosis remains elusive because of uncertainty about its causative agent(s). Building on data from our previous research, we will (1) determine the bacterial, protozoal and viral biodiversity in wildlife ticks and their native mammal hosts, and (2) provide new information about the biology and transmission dynamics of these microorganisms, and their potential to cause disease in wildlife, domesticated animals and humans. This research will lead to improved diagnostic tests and management protocols for tick-borne disease in Australia.

'Backyard Bandicoots: engaging community in urban bushland conservation'

Administering Organisation: Murdoch University

Investigators:

1	A/Prof Patricia Fleming	<input type="text" value="Chief Investigator"/>	Murdoch University	Murdoch University
2	Prof Giles Hardy	<input type="text" value="Chief Investigator"/>	Murdoch University	Murdoch University
3	Dr Catherine Baudains	<input type="text" value="Chief Investigator"/>	Murdoch University	Murdoch University
4	Miss Jenna Bishop	<input type="text" value="Partner Investigator"/>	City of Mandurah	City of Mandurah

Proposal Summary

This study contributes an important international model for urban ecosystem function and restoration. Digging mammal species turn over substantial volumes of soil as they dig to forage on invertebrates, subterranean fungi, and plant material. These ecosystem engineers contribute to water infiltration, nutrient cycling, increased soil microorganism function, and seedling recruitment. They spread hypogeous mycorrhizal fungi that contribute to plant nutrition, a crucial role in Australia's nutrient-poor soils. Working with the Mandurah City community, we will identify resources used by urban bandicoots (quenda), enhance bushland reserves through targeted plantings, and identify and mitigate threats to their persistence in cities.

'Wicked problems: optimising fire management for a resilient future'

Administering Organisation: Murdoch University

Investigators:

1	Prof Neal Enright	<input type="text" value="Chief Investigator"/>	Murdoch University	Murdoch University
2	Dr Joseph Fontaine	<input type="text" value="Chief Investigator"/>	Murdoch University	Murdoch University
3	Dr Ben Miller	<input type="text" value="Partner Investigator"/>	Botanic Gardens & Parks Authority	Botanic Gardens & Parks Authority

Proposal Summary

Fire risk management is a conundrum for agencies responsible both for protection of life and property and biodiversity conservation. Global change factors (rainfall decline, warming, invasive species, ecosystem fragmentation) interact with changes in fire regime (interval and season) associated with prescribed burning to affect the regeneration capacity of native species. We will quantify these interactions to reveal the complex vulnerabilities of native ecosystems to managed fire and derive clear management guidelines that simultaneously optimise risk minimisation and ecosystem resilience in the face of global change. We will also test the validity of modern best-practice in predicting the sensitivity of plant communities to managed fire.

'Fume resistant explosives for critical areas'

Administering Organisation: Murdoch University

Investigators:

1	Prof Bogdan Dlugogorski	Chief Investigator	Murdoch University	Murdoch University
2	Dr Jeffrey Gore	Partner Investigator	Dyno Nobel Asia Pacific Pty Ltd	Dyno Nobel Asia Pacific Pty Limited
3	Dr Mohammednoor Altarawneh	Chief Investigator	Murdoch University	Murdoch University

Proposal Summary

Dyno Nobel Asia Pacific has recently developed a new formulation of ammonium nitrate (AN) emulsion explosive that provides excellent resistance against emissions of NO_x fumes. This project aims to understand how the explosive works and expand its application to critical areas. We will investigate physical and chemical parameters of the key emulsion components and will formulate new blends for higher-strength applications. The research will characterise the surface burning process of AN prills and other materials to gain insights into possible NO_x production and mitigation pathways. The results from the project will overcome the limitations of the new technology, enhancing the competitiveness of this Australian company.