2010 Annual Report

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Statement of Compliance

The Hon. Dr Elizabeth Constable (MLA)
Minister for Education
19th Floor, Governor Stirling Tower,
197 St Georges Terrace,
PERTH WA 6000

9 March 2011

Dear Minister,

In accordance with Section 63 of the Financial Management Act 2006, we hereby submit for your information and presentation to Parliament the Annual Report of Murdoch University for the financial year ended 31 December 2010.

The Annual Report has been prepared in accordance with the provisions of the Financial Management Act 2006.

Yours sincerely

T C Budge
Chancellor

J V Yovich, AM
Vice Chancellor

Murdoch University continues to stand out as a high teaching quality, research focused institution that is building for the future on its historical strengths.

Murdoch University has achieved much in 2010 in what has been a busy year for research-led Universities with many external changes such as continuing Government reform to changes in the dynamics around international student recruitment.

I'm proud to say that Murdoch has successfully met those challenges and achieved much in 2010. Murdoch University will finish the year with record student enrolments and a healthy financial surplus.

For more than 30 years Murdoch has welcomed a broad spectrum of students that includes those with near perfect ATAR scores but also many students who are the first in their family to attend university, who come from a low socio-economic status background, or are educationally disadvantaged. In light of a renewed focus on increasing university participation by both the Commonwealth Government and businesses seeking skilled workers, our longstanding commitment to being a socially responsible, sustainable institution is more relevant than ever before.

The new Strategic Plan will see the blossoming of our well-earned reputation in renewable energies, sustainability and environmental science to lead Australia into a carbon-constrained economy. Embedded in our teaching, research and engagement with business and the community, our approach to renewable energy is unique in Australia because it covers the social, economic and environmental dimensions as well as the technical aspects. Importantly, that commitment is being put into practice on campus through projects such as the installation of solar energy panels on the library roof, new recycling bins across campus and the development of greener buildings and infrastructure.

Researchers at Murdoch continue to have considerable success in attracting funding from a variety of sources. Key elements of research infrastructure were also announced or completed in 2010. The State Government will invest $30 million over three years to jointly develop the Australian Export Grain Innovation Centre with Murdoch University. This Centre will bring together scientists, policy makers, industry groups and commercial partners in an holistic endeavour to improve grain quality, biosecurity and productivity.

The installation of a new supercomputer, the largest in Western Australia and ranked 87th in the world, in the Centre for Comparative Genomics will facilitate research in computationally demanding areas such as radioastronomy, nanoscience, geoscience and the agricultural and life sciences.

The strategic development of transnational programs has underpinned a steady growth in offshore student numbers and income. In Singapore we have strengthened our partnership with Kaplan Education Pty Ltd to offer the most extensive range of Murdoch courses available in South-East Asia. Students are able to choose among 26 programmes from areas as diverse as communication, education, commerce and psychology. Murdoch Dubai saw a 170 per cent growth in student numbers this year. Enrolment growth has allowed the University to generate significant income that supports those Schools involved but also provides unencumbered funding available for strategic programs.

Murdoch also entered the executive education market in 2010, offering fee for service non-accredited short courses to middle and senior management in the corporate, not-for-profit and government sectors. Murdoch University is working with the WA Chamber of Commerce and Industry to deliver a collaborative approach to the development and delivery of leadership and management development programs.

Murdoch has long understood that such change will best be achieved through engaging with and valuing the wider Murdoch community. This approach saw the establishment of the Murdoch University Foundation and Banksia Association to continue to build on our relationships with our staff, students, alumni and community and to grow the University's endowment– a critical component in helping secure Murdoch's future financial independence.

The Murdoch University Foundation's campaigns raised a total of $6,956,740, including $5,130,000 through the Genesiis campaign for establishing the Institute for Immunology and Infectious Diseases.

On behalf of Senate and the senior management of the University, I thank our staff and students for their contributions to the University's outstanding achievements in 2010.

Professor John Yovich AM

Vice Chancellor

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Teaching and Learning

Record domestic student enrolments were again achieved in 2010. Murdoch University handled its largest ever volume of applications in 2010 with procedural changes streamlining online applications and assisting in the retention of deferred students.

Providing a positive start to uni life

Helping students to engage with the University during their first year has been a major focus at Murdoch in 2010. A group of First Year Advisors has been employed to promote a smoother and less daunting transition year. These advisors will manage the 'At Risk' program, contacting students who have shown signs they are in danger of falling behind or disengaging with their studies.

More than $450,000 was awarded as part of Senate Scholarships with a further $150,000 as part of the Vice Chancellor's First Year Scholarships, aimed at assisting students overcome some of the financial hurdles faced when commencing university study.

Newly designed and structured foundation units were introduced during the year, along with extra Unit Coordinator support, tutor recruitment and training. Retention strategies included student outreach, workshops in non-teaching weeks for students requiring extra assistance and the development and implementation of diagnostic assessments. The introduction of a mandatory Indigenous aspect to each foundation unit has provided an avenue to bring some Indigenous understanding to the wider student community.

Access, participation and retention

As part of the University's response to the Federal Government's aim to fill 20 per cent of domestic undergraduate enrolments with students from low socio-economic backgrounds by 2020, Murdoch has continued to advance strategies that both seek to raise the aspirations of high school students and to provide alternative and non-traditional entry pathways for students.

These included:

- The Discover your Potential Scholarship Fund, established this year, which offers Year 12 students from the Rockingham and Kwinana area a $2500 scholarship for each year of an undergraduate degree. The scholarship program was established by the Murdoch University Foundation and the Rockingham Education Development Group in memory of Gary Holland, Past Chief Executive Officer of the City of Rockingham.
- The Murdoch Entry Award Scheme, which allows high schools to nominate students who they believe have the potential to succeed at university but would not have otherwise qualified, has also been expanded to improve opportunities in the South-West region.
- The PX2 program, piloted with Rockingham Senior High School in late 2009, where participants learn about practical, down-to-earth concepts and tools relating to goal setting, accountability, communication, problem solving, self-efficacy, self-esteem, affirmations and motivation. The program is being restructured to scaffold aspiration building from Years 8 through to 12.

Supporting students

There are currently 1,153 students with a disability at Murdoch, making up 6.4 per cent of the student population who are active users of Murdoch's support services. Improvement to services in 2010 included:

- upgrades to the interactive EQAL database tool, which enables students to access learning supports.
- further articulation of the Pre-Orientation Program (POP) into pre-Second Semester, which ensures new students are introduced to support personnel, equipment, assistive technologies and software such as EQAL, prior to commencing study.
- revised maps of all Murdoch's campuses to improve physical access awareness.

Kulbardi Aboriginal Centre made considerable progress towards meeting Murdoch's values of Equity and Social Justice in 2010. Highlights for the year included record enrolments for the Kulbardi Aboriginal Tertiary Entrance Course and an increase of students accessing Federal Government-funded Indigenous Commonwealth Scholarships.

An elite athlete student scholarship fund was established in 2010 to assist students facing significant competition costs and to ensure studying and competing remains in balance. The first recipient was Sports Science student Eloise Cane whose scholarship enabled her to compete at the World Championships in aerobic gymnastics.

In 2010 there were 4,374 students from as far away as Africa and Russia who took advantage of external studies, with 9,277 enrolments in external units. For the first time, external students could submit assignments online through the Learning Management System, reducing turnaround time on marking and improving assessment tracking.

Research and Development

In line with the key strategies set out in Murdoch University's Strategic Plan 2010—2015, the University is focusing its research endeavour into strategic themes of strength and emphasis. These will be further refined to take account of the outcomes of the first Excellence in Research for Australia exercise.

The University's research funding for 2010 totalled $37.5 million. This was a reduction on 2009's record research income which was augmented by a significant one-off funding allocation for research infrastructure. However, highlights for the year were outstanding performance in obtaining Grains Research and Development Corporation competitive funding in excess of $2.7 million, strong results in the Australian Research Council schemes, particularly in the social sciences where $1.1 million was awarded, and three National Health and Medical Research Council grants worth $1 million. 2010 also saw a recovery in Australian industry funding post the Global Financial Crisis.

Research Highlights & Honours

Recognising Asian research exellence

With the funding of Asia Research Centre Postdoctoral Fellow, Dr Shahar Hameiri, the School of Social Sciences and Humanities has received its fifth prestigious ARC Fellowship in three years. This is a performance record rivalled by only a handful of academic organisational units at the nation's best universities and underscores the depth and quality of research on Asia at the University.

Nanoscience doctoral student Xuan Le Thi and Asia Research postgraduate students Nikkola Pickering and Jodie Goodman were awarded Prime Minister's Australia Asia Endeavour Awards this year. Murdoch University received two out of only eight Indonesia awards.

Former United States of America Consul General to Perth, Dr Kenneth Chern, was appointed as a Professorial Research Fellow. An expert in Asian affairs, Dr Chern will work across the University to support its leading-edge research into South East Asian affairs, particularly assisting the Asia Research Centre, the Asia Pacific Intellectual Property Law Institute and programs in Asian Studies.

Investigating the history of Anglicanism

Associate Professor Rowan Strong has been commissioned by Oxford University Press, in the United Kingdom, to publish a five volume series on the history of Anglicanism. The series will be the most extensive historical investigation undertaken on this global religious community. It will involve over 100 international scholars, with an editorial team of five British and North American historians headed by Associate Professor Strong as Series Editor.

Improving health through nanotechnology

School of Engineering and Energy nanotechnology lecturer Dr Eddy Poinern was awarded a Bill and Melinda Gates Foundation Grand Challenges Explorations grant. This initiative helps scientists around the world explore bold and largely unproven ways to improve health in developing countries. Dr Poinern is researching an 'inject and forget' delivery system for contraceptive drugs using a novel biosynthetic bone-like material, which, once injected subdermally, slowly releases a controlled drug dosage.

Battling a deadly wheat fungus

With four new mutations of stem rust – a devastating wheat fungus – overcoming existing sources of genetic resistance developed to safeguard wheat crops, Murdoch University's Associate Professor Mehmet Cakir has been funded by the Grains Research Development Centre and the University to develop wheat genes resistant to stem rust.

New research centres tackle key issues

Murdoch is set to be a key participant in two new cooperative research centres (CRCs). The $27 million CRC for Young People, Technology and Wellbeing will study how technology can help prevent and treat mental illness in our youth. The $20 million CRC for High Integrity Australian Pork will support our pork producers and regional Australia to maintain local production of high quality food at affordable prices, while improving pig welfare.

Reducing reliance on fossil fuels

A $10 million joint venture to completely sequence the genomes of 100 different rhizobial strains selected from distinct global geographical regions has been established between the Centre for Rhizobium Studies (CRS) led by Dr Wayne Reeve at Murdoch University and the Joint Genome Institute (JGI, USA) led by the Head of the Microbial Program Dr Nikos Kyrpides. The research into the nitrogen-producing soil bacteria could lead to the elimination of fossil fuel-based fertilisers.

Finding solutions to chronic pain

Psychology lecturer Professor Peter Drummond and Adjunct Professor Dr Phil Finch, in collaboration with the School of Veterinary and Biomedical Sciences, this year established the Centre of Excellence for Pain Research. With funding from NHMRC, ANZA, Pfizer and individual donors such as St Judes Medical, the Centre aims to find solutions for chronic pain and inflammatory diseases.

Supporting Aboriginal health

Murdoch University's Professor Rhonda Marriott and Associate Professor Cheryl Kickett-Tucker are part of a $2.5 million research project to examine why the majority of health and social services fail to improve Aboriginal people's health and wellbeing. This Perth Telethon Institute for Child Health Research project has been awarded a prestigious Centres of Research Excellence award over five years.

Optimising copper production

Professor Mike Nicol will explore factors governing the rates of electrode corrosion using Murdoch's newly-commisioned electrowinning pilot plant, which was recently donated to the University by BHP Billiton. The research will identify ways to maximise copper production while minimising costs and reducing energy consumption.

Creating opportunities for youth

The close engagement between communities in Rockingham and Kwinana with their schools, and the connection between school, life employment opportunities and community organisations in low socio-economic areas will be examined in two ARC Linkage Projects valued at almost $200,000 and led by Professor Barry Down and Dr Peter Wright.

Exploring South-East Asian climate history

Professor James Warren of the Asia Research Centre was awarded a three-year, $400,000 ARC Linkage Grant for his international collaborative project on the history of South-East Asia's global economy and climate. This links with a seven-year $2.5 million, Social Science and Humanities Research Council Major Collaborative Research Initiative (MCRI) project on The Indian Ocean World led by Professor Gwyn Campbell, Director of the Indian Ocean World Centre, McGill University and in which Professor Warren is a Chief Investigator and team leader.

Uncovering effects of political change

A partnership with leading social psychological researchers at Groningen University in the Netherlands has been cemented with the award of an ARC Discovery Grant to Social Research Institute Director Craig McGarty. The project, that also involves the Universities of Sydney and Queensland, will unravel the social psychological dynamics of political change in Australia and the Netherlands.

Research Outcomes

Pasture legume likely to be big-seller

A new Murdoch-bred French serradella cultivar 'Eliza' is likely to become the biggest selling pasture legume cultivar in WA. Bred to suit the northern and eastern wheatbelt, Eliza's ability to flower early will provide more reliable seed production and be less dependent on favourable spring conditions.

Online portal to help farmers

Murdoch's Centre for Comparative Genomics has developed the Farm Improvement Web (FIWeb) portal with farmers in WA's wheatbelt shire of Corrigin. FIWeb collates in one area the masses of farm-level data collected nationally and locally which impacts on farming decision-making. Farmers and agronomists will use the site to share environmental, soil moisture and nutrition information at the paddock level in an easy-to-use system.

National honour for meat science

Professor David Pethick shared in the 2010 Australian Research Council Eureka Prize for Excellence in Research by an Interdisciplinary Team. Professor Pethick was part of the Meat Standards Australia team which designed the world's first comprehensive paddock-to-plate meat grading system. He also led the team in evaluating a number of key control points that determine the eating quality of beef and the system's expansion to include lamb and sheep.

First ancient human DNA sequenced

In a world first, Murdoch University's ancient DNA expert, Dr Mike Bunce, worked with an international team to sequence the entire genetic code of a long-deceased human. The DNA was isolated and sequenced from a 4,000 year-old clump of male hair found in an archaeological dig in Greenland.

Developing desalination technology

In 2010 the National Centre of Excellence in Desalination completed its inaugural Funding Round of $3 million which generated more than $11 million in research activity. A second $3 million funding round was undertaken in December 2010.

The Centre appointed Mr Graeme Rowley, former Executive Director of Operations at Fortescue Metals Group, as inaugural Independent Chair and Mr Neil Palmer, former General Manager of Technical Services at Osmoflo, as Chief Executive Officer.

Murdoch has executed a Funding Assistance Agreement with the WA Government for $3 million over three years to build the Pilot Research Facility. The construction has now started.

Probe into Swan River dolphin deaths

Murdoch University conducted the official investigation into the death of six bottlenose dolphins in the Swan Canning Riverpark in 2009. The multidisciplinary team analysed their findings and presented the Chief Scientist of Western Australia's report to the Environment Minister, in 2010.

Secrets of Ancient DNA unlocked

Using a technique which he invented, Murdoch ancient DNA expert Dr Mike Bunce isolated DNA from a 20,000-year-old fossilised emu eggshell to explore evolutionary processes. The DNA is the oldest found in Australia and the technique he discovered could help scientists understand details of extinct birds.

Climate Change mapped through kangaroo evolution

Changes to the kangaroo skeleton over time reflect Australia's changing environment and climate. The findings, published in the Zoological Journal of the Linnaean Society, are the most reliable and detailed kangaroo family tree to date and highlight that conservation is a priority for this species.

Investigating child health

Now in its third year, this research project explores how a child's biological make-up interacts with the physical, psychosocial and community environment as they develop. The study is the first to look at how these factors work together and will help to guide future health policy and practices that influence health and wellbeing in our community.

Asbestos website launched

A team of historians and journalists at Murdoch has compiled a comprehensive website and digital archive telling the story of asbestos and related diseases in Australia. Launched in Asbestos Awareness week in November, the site features interviews and digital artifacts and provides a forum for people to tell their own stories and provide mutual support.

New supercomputer to boost scientific capability

A new supercomputer, approximately 10 times the capacity of the existing facility, and boasting 9600 processing units and 500 terabytes of high performance storage, has been installed in the School of Information Technology's Centre for Comparative Genomics (CCG). It is the largest in WA and rivalled in Australia only by a CSIRO facility in Canberra. Supplied by HP and funded by the CSIRO, it will be managed by the CCG to provide computing power for research at Murdoch as well as throughout the state and around the world.

Professor Matthew Bellgard, Director of the Centre for Comparative Genomics in the School of Information Technology was appointed to the Australian Research Council's Future Fellowships Selection Advisory Committee.

World cup used for 3D study

An in-depth study on 3D TV was conducted for ESPN, a leading multinational, multimedia sports entertainment company based in the US, by Dr Duane Varan, Professor of New Media and Executive Director of the Interactive Television Research Institute. The research was undertaken during ESPN's coverage of the 2010 FIFA World Cup at the Disney Media and Ad Lab in Austin, Texas and compiled results from more than 1000 testing sessions and 2700 lab hours.

New advances in vaccine development

The Institute for Immunology and Infectious Diseases (IIID) research team has developed a number of proprietary genetic tests, methodologies and analysis tools for improving vaccine development and drug treatments of viral infections such as HIV and Hepatitis C.

This year the group developed a novel, proprietary genetic screening test for predicting and improving response to treatment in patients with Hepatitis C using interferon therapy. Developed in collaboration with leading researchers from the University of Sydney and Sydney West Area Health Services, the test has health benefits nationally and internationally as chronic Hepatitis C is a growing global problem. The test also has economic benefits by predicting those patients to whom the expensive interferon treatment should be administered.

Safer and cheaper batteries for electric vehicles

The lithium hydroxide battery currently under development at Murdoch by Dr Manickam Minakshi has the potential to provide safer and cheaper rechargeable batteries. This would have applications for electric vehicles. It is currently subject to a patent application which proceeded to an international Patent Cooperation Treaty (PCT) application in October.

Wastewater solution for remote areas

A novel wastewater treatment technology promises to offer more reliable wastewater treatment for remote and low-technology regions. Parallel nitrification-denitrification, a simpler and more economical process, has gone to National Phase patent application in several countries including Australia.

New advances in biocement technology

Dutch-based environmental research institute Deltares, which holds an option and research and development agreement to Murdoch-developed BioCement Technology, concluded large scale in-situ pilot testing of microbial-initiated carbonate precipitation in January. Further trials at commercial scale are planned, with the group currently seeking potential commercial applications for the technology.

Commercialisation

Commercialisation of research outcomes is an exciting and expanding progression of Murdoch University's research excellence, and the University has been strongly involved in commercialisation activities during 2010.

Overall, more researchers are becoming engaged with commercial sector research and industry partnerships. Murdoch's Commercialisation Office has received an increased number of invention disclosures from staff and students and filed a growing number of patent applications, showing an expanding activity in innovation.

Commercialisation efforts for other intellectual property developed at Murdoch University are continuing. In collaboration with the other Western Australian universities, and sponsored by various private and public institutions including the Commonwealth Government, the inaugural Univation event in November showcased university-developed technology to potential sponsors, industry partners and investors.

Specific areas of commercialisation of Murdoch's research output include:

Safeguarding grain exports

Spin-off company Scicom was established in 2010 and, through a relationship with Murdoch University's Separation Science Group and Cooperative Bulk Handling, is undertaking market development of a high-resolution pesticide residue testing program for grain – ResChek. Scicom is also working with the Separation Science Group on a collaboration with major Brazilian pig and poultry producers to introduce a new fast, high-resolution residue testing program for their export meat market.

New treatments to fight animal parasites

Led by School of Veterinary and Biomedical Sciences parasitologist Professor Andrew Thompson, a Murdoch research team continued to investigate the development of novel veterinary drugs to treat enteric parasites. Murdoch University and Bayer Animal Health this year entered into a research agreement to screen over 50 compounds synthesised by Epichem for in vitro activity against parasites which affect livestock and dogs.

Protecting Australian crops

NemGenix, a Murdoch University spin-out company, extended its research collaboration with Dow AgroSciences for a further year. This collaboration focuses on developing a trait to confer resistance to plant parasitic nematodes in a specific crop species. NemGenix is also undertaking a project to develop nematode resistance in sugarcane with funding from AusIndustry via a Climate Ready Program grant, which includes the support of five full-time researchers. NemGenix has continuing involvement with a major project funded by the Federal Government's Australia India Strategic Research Fund. This project provides funding to both Murdoch University and the Indian Agricultural Research Institute for joint research on developing nematode resistance in wheat.

Vaccine against swine dysentery

Another Murdoch University spin-off, Spirogene, has had a successful year securing a research and development and licensing agreement with one of the world's largest animal health companies for a vaccine for swine dysentery. The vaccine for swine dysentery is the result of work by Professor David Hampson and his team who are acknowledged leaders in this field. Spirogene also secured the rights to commercialise an ELISA diagnostic test for swine dysentery from a collaborative research project between the Pork Cooperative Research Centre and Murdoch University. Negotiations are ongoing for a collaborative research and development project for the development of a vaccine for avian intestinal spirochaetosis for 2011 with another leading animal health company.

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