THE UNIVERSITY OF MELBOURNE

Research and Research Training Plan 2004

The University of Melbourne

Our Cover

Front: Gene Sleuths: PhD students Trent Perry (left), Michael Bogwitz (centre) with Dr Phil Batterham (Genetics), Program Leader for the Chemical Stress Program within the Centre for Environmental Stress and Adaptation Research (CESAR), an Australian Research Council (ARC) Special Research Centre shown here with the Research Computer.

Back: The beauty and elegance of nanocrystals: Chemistry PhD student Craig Bullen with cadmium selenide nanocrystal flurophores.

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Acronyms

ARC	Australian Research Council
CRCs	Cooperative Research Centres
DEST	Department of Education, Science and Training
DVCR	Deputy Vice-Chancellor (Research)
HDR	Higher Degree Research
IGS	Institutional Grants Scheme
IP	Intellectual Property
LIEF	Linkage-Infrastructure, Equipment and Facilities
MRIO	Melbourne Research and Innovation Office
NHMRC	National Health and Medical Research Council
PBC	Planning and Budget Committee
RIBG	Research Infrastructure Block Grants
RAGS	Research and Graduate Studies
R&RT	Research and Research Training
RTS	Research Training Scheme
SGS	School of Graduate Studies
VP	Vice-Principal

'The Research and Research Training Plan is a framework for the University community to pursue identified strategies and targets to advance the excellence of research and research training.'

Professor Frank Larkins
Deputy Vice-Chancellor (Research)

Preface

The Research and Research Training Plan constitutes a companion document to the Teaching and Learning Management Plan to elaborate on the priorities identified in the University of Melbourne Strategic and Operational Plans. These two detailed Plans encompass the core academic activities of the University.

A comprehensive description is provided of the strategies and targets considered to be the most appropriate for achieving the University goal of strengthening the performance and reputation of Melbourne as a major international research university and as a destination of preference for outstanding research postgraduate students, nationally and internationally.

The Research and Research Training Plan is a framework for the University community to pursue identified strategies and targets to advance the excellence of research and research training. The benefits of University research are manifested through the enhancement of the intellectual and practical skills of researchers, the generation of new knowledge and value adding for public good and private gain through effective knowledge transfer.

Realisation of the desired outcomes depends upon the considerable talent and commitment of staff and students for which the University is most appreciative.

Professor Frank P. Larkins
Deputy Vice-Chancellor (Research)

Research and Research Training Plan

1. Mission

The University of Melbourne is committed to becoming one of the finest universities in the world.

2. Goal

As a research-led University nurturing research excellence in a wide range of disciplines, a key goal identified in the University's Strategic Plan is to advance the performance and reputation of Melbourne as a major international research university and as a destination of preference for outstanding research postgraduate students, nationally and internationally.

The late Ms Anthea Carstairs, left, and Dr Wilfred Shawcross excavating Mungo Man (Mungo III). A University of Melbourne-led study has achieved consensus among scientists that Mungo Man is 22,000 years younger than the previously estimated 62,000 years.

3. Objective of the Research and Research Training Plan

The R&RT Plan provides a framework of strategies and targets for achieving the following objectives which have been identified as central to the University's commitment to quality research.

The objectives are to:

- nurture research excellence across all disciplines to support quality teaching and learning programs, while maintaining high ethical standards;
- provide a stimulating environment for research education and training activities so that students achieve the attributes desired of Melbourne research graduates (Appendix 1);
- promote innovative research initiatives through incentives and rewards that lead to international quality outcomes in skills and new knowledge;
- foster linkages with external bodies in the public and private sectors embracing regional, national and international interests to improve the competitiveness and benefits of the research undertaken;
- contribute economic and social value through the transfer of ideas and technologies to produce new products, processes and services; and
- Recognise achievements by staff and students in research through performance-based funding and reward mechanisms.

4. Policy Setting Framework

The Academic Board and the University Council are advised on R&RT policies by the Research Sub-Committee through the PBC (Appendix 2, Terms of Reference) and by the RAGS Committee (Appendix 3, Terms of Reference). The outcomes of these deliberations are reflected in this Plan which in turn is linked to the University Strategic and Operational Plans. Faculties and departments will develop their discipline-orientated plans within this framework. These plans will provide the basis for annual reviews of performance at various levels in the University.

The University seeks to improve its research profile by:

- significantly increasing its resource base;
- attracting and retaining high quality staff;
- increasing its share of the very best students from a range of disciplines and countries; and
- strengthening strategic alliances with national and international partners.

5. Research Agenda

5.1 Establishing Priorities, Recognising and Supporting Strengths

Strategies

- Encourage excellence in research and scholarship across all disciplines, while concentrating resources where researchers, research groups and research activities are of demonstrably international quality.
- Identify and nurture particularly, those fields of research activity in which the University has achieved 'critical mass' capability, or enjoys demonstrable strategic opportunities or comparative advantages.

The University has more than 5,700 researchers, including over 3,500 higher degree research students. Some 100 research centres provide a focus for research activities in specialist disciplines and in multi-disciplinary fields. Research strengths have been identified across a broad range of disciplines. It is a hallmark of the University of Melbourne that staff of high national and international standing are located in all faculties. They exercise freedom of choice concerning research within the constraints of available resources.

Broad research areas of particular international significance that represent major priority areas for investment by the University will be identified using a combination of the following performance criteria:

- the eminence of research leadership and the size of the research enterprise;
- the level of external funding support;
- the strength of, and output from, research education and training activities;
- the range and quality of international publications and patents;
- the breadth of peer review recognition through plenary lectures and awards; and
- the range of research collaborations and strategic partnerships established.

These criteria will form the basis for selection of the major research strengths reported to the DEST as part of the R&RT Management Report. Inevitably for the University of Melbourne, identified research strengths will be represented by clusters of discipline-based activities. The highest ranking research strengths currently identified are listed in Appendix 4. Research Centres form an important part of the University plan to concentrate research effort and to build critical mass in priority areas. Guidelines for the creation, management, reporting, review and disestablishment of centres will be monitored and revised as necessary.

2004 Targets

- Implement the next major phase of the *Bio21* project with increased commitments by staff from a range of Departments, faculties and affiliated institutions.
  Accountability: Director, Bio21 Molecular Science and Biotechnology Institute.
- Successfully establish new initiatives supported by the next round of Victorian Government Science, Technology and Innovation (STI) Program Grants.
  Accountability: DVCR and Deans.

Table 1. National Comparison of Key Research Parameters

Year*	Total HDR Load (ResDoc+MRes) (EFTSU)	HDR Completions (ResDoc+MRes) (Number)	Australian Competitive Grants ($ million)	Total Research Income ($ million)	DEST Apportioned Weighted Research Publications (Number)
1998	2,513 (2)	479 (1)	52.6 (1)	99.4 (1)	2,595 (1)
1999	2,623 (2)	543 (1)	58.9 (1)	104.7 (1)	2,791 (1)
2000	2,703 (1)	583 (1)	60.5 (1)	118.9 (1)	2,331 (1)
2001	2,727 (1)	588 (1)	66.5 (1)	137.1 (1)	2,363 (1)
2002	2,785 (1)	663	74.8	158.8	2,855

*Notes: *For all years, the national ranking is given in parentheses. The ranking for 2002 is known for one parameter only.*
For 2002, the ARC LIEF Grant ($402,700) is not included due to new DEST guidelines.
ResDoc: Research Doctorates
MRes: Masters by Research

Some 100 research centres provide a focus for research activities in specialist disciplines and in multi-disciplinary fields. Research strengths have been identified across a broad range of disciplines. It is a hallmark of the University of Melbourne that staff of high national and international standing are located in all Faculties.

- Document and promote the University's substantial activities and achievements in the National Research Priority Areas. *Accountability: DVCR.*
- Achieve success in at least one of four DEST International Centres of Excellence as a lead agency. *Accountability: DVCR and Deans.*

5.2 Quality Assurance Measures

Strategies

- Monitor quality and performance of research and research education at all levels through regular, systematic benchmarking against the highest international standards.
- Use a research performance appraisal process to improve research management and output by faculties.
- Develop a plan for improving HDR completion rates including the closer monitoring of the qualifications of HDR applicants.

The RAGS Committee of the Academic Board has the principal role on behalf of the academic community to advise on research performance, research training programs and outcomes and to oversee general quality assurance procedures to achieve a research best-practice performance.

Academic oversight of research and research training performance is provided by the DVCR, the Dean of Graduate Studies and the Deans of Faculties. A range of benchmarking exercises will be conducted annually to assess performance against other research intensive universities.

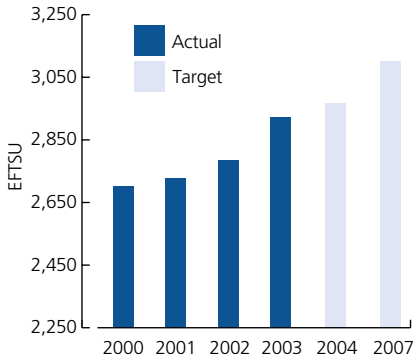
The measures include:

- assessment of grant competitiveness;
- progression and completion performance for research students;
- evaluation of the DEST research performance parameters used for allocation of support for research training and research enabling facilities (i.e. Research Income, HDR load, HDR completions, research publications); and
- comparison with international departments with a similar discipline profile.

2004 Targets

- Each faculty to demonstrate improved performance against discipline-specific/department-specific parameters that they have set within the framework on 'Quality Assurance in Research' approved by Academic Board. *Accountability: Deans.*
- Each faculty to demonstrate appropriate analysis of comparative performance against key components of the annual Group of Eight research benchmarking survey and, where appropriate, develop initiatives to enhance performance outcomes. *Accountability: Deans.*
- Identify faculty-specific HDR completion rate milestones. *Accountability: Dean of Graduate Studies and Deans.*

Figure 1. The University of Melbourne Total Higher Degree Research Load



5.3 Staff Development

Strategies

- Give high priority in the reward and recognition systems of the University to excellence in basic and applied research and in research education.
- Further develop the suite of short courses, seminars and mentoring programs delivered by the MRIO and the SGS designed to improve staff performance in research and research training.

Development of academic staff skills to achieve expertise in research and research education is an important priority. The University will provide assistance through a range of central services linked to Human Resources, the Centre for the Study of Higher Education, the Information Division, the SGS and the MRIO to improve research and research training performance. Faculties and departments will be expected to nurture new staff through mentor schemes and to take measures to realign the research activities of existing staff in accord with planned outcomes and research funding realities. Training programs to improve the quality of research supervision will be conducted with attendance being mandatory for all new supervisors. The *Eleven Practices of Effective Postgraduate Supervisors* will be promoted to academic departments and supervisors to provide strategies for the development of flourishing HDR teaching and learning environments.

Targeted funding will be provided for early career researchers through a competitive grant scheme designed to prepare staff for winning support for their research from external bodies. Faculties and departments will be expected to provide financial support for research initiatives designed to build staff expertise leading to an enhancement in the quality of educational outcomes.

Exceptional sustained research performance will be recognised by the University through the conferring of the title Laureate Professor on distinguished academic staff.

While acknowledging that the benchmark for defining an acceptable level of research performance by staff may vary considerably between disciplines, the University will assess the research activities of teaching and research staff.

Performance will be evaluated at both the departmental and University levels as part of an annual review process. Whilst the process differs amongst the faculties, at the University level, performance will be based upon a three-year period for teaching and research staff of 0.5 FTE and above. A minimum level of performance expected of a research active staff member will be two refereed research manuscripts in the past three years in a DEST publication category and achievement of at least one of the following measures:

- supervision to successful completion of at least one HDR student in the past four years;
- one external research grant success of more than $10,000 from a Competitive Grant Scheme or from industry in the past three years; and
- Publication of the equivalent of an additional three refereed journal articles (DEST classifications) in the past three years.

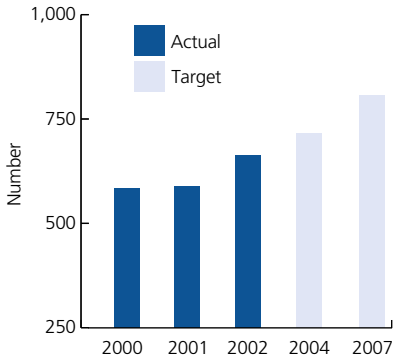
Research-only staff employed by the University for at least three years will be assessed in a similar manner.

In a number of disciplines a higher level of performance will be a reasonable expectation. Data from this annual analysis will be provided to Deans and Heads of Departments for staff development purposes.

2004 Targets

- Achieve research active academic staff performance in each faculty to at least 85% using the new criteria for performance. *Accountability: Deans.*
- Establish the pilot Early Career Professional Development and Support Program for Academic Staff. *Accountability: DVCR and VP (Human Resources).*
- Meet the targets agreed with the SGS for staff participation in workshops for HDR supervisors. *Accountability: Deans.*
- Demonstrate a high level of satisfaction with the suite of staff development programs delivered by the MRIO and the SGS. *Accountability: DVCR and Dean of Graduate Studies.*

Figure 2. The University of Melbourne Total Higher Degree Research Completions



5.4 Research Student Support

Strategies

- Give high priority to timely quality completions of research higher degrees in the context of designated areas of research strength.
- Provide opportunities for increased industry investment in research education and training, particularly through the Melbourne Research Scholarships Program.
- Provide postgraduate research students with research supervision, infrastructure and support of the highest possible quality, enhancing their career prospects through programs designed to develop leadership and professional skills, and use regular, systematic feedback from such students to assist in the professional development of supervisors.

Research students have a very important role in contributing to the research profile of the University. It is important for research projects to be chosen which are compatible with the interest and academic capability of the student, commensurate with the expertise of the supervisor and achievable with the resources available.

The University will deliver an integrated program of enrichment, academic support and professional skills development programs to Australian and international postgraduate students from enrolment through to completion of their studies.

Initiatives from the SGS will include:

- comprehensive orientation and induction programs in collaboration with the University of Melbourne Postgraduate Association, faculties and departments;
- an integrated suite of academic skills and professional development programs for commencing, continuing and completing research students;
- an academic orientation program for international students; and
- academic activities grants for conferences, seminars, symposia, web developments, exhibitions and academic events.

2004 Targets

- Report to the Academic Board demonstrating improved completion rates and times for HDR students and, for those faculties with below average ratings, improved satisfaction levels with research supervision and support for HDR students.
  Accountability: Dean of Graduate Studies.
- Meet 2004 load targets for Australian HDR commencing and international HDR students.
  Accountability: Deans.
- Research student satisfaction surveys regarding the quality of supervision to show increases from 2003.
  Accountability: Dean of Graduate Studies.

The University will deliver an integrated program of enrichment, academic support and professional skills development programs to Australian and international postgraduate students from their enrolment through to completion of their studies.

5.5 Resourcing Research

Strategy

- Strengthen the research infrastructure resources to facilitate internationally competitive research across a broad range of disciplines.

Quality R&RT outcomes require state-of-the-art infrastructure resources to underpin performance. The University will seek to provide access to library facilities and high speed international networks, research equipment, workshops, serviced laboratories, animal houses and technical and administrative support within its financial capacity. Academic staff will be encouraged to form networks and strategic alliances to share expensive resources.

The University statement on Infrastructure Support for Postgraduate Research Students has been endorsed by the Academic Board as a guide to academic departments (http://www.research.unimelb.edu.au/postgraduate/infrastructure.html). Faculties will be required to account for the performance of departments relative to the standards presented in the guidelines.

Continued diversification of the funding base for R&RT is essential if the University is to advance its international performance and reputation. Research planning to strengthen infrastructure resources will include the following actions:

- targeting of major national and international funding schemes in areas of comparative advantage;
- strategic use of both national and international research performance data to identify funding opportunities and to maintain current strengths in attracting research income;
- use of advanced technology for the dissemination and accessibility of research funding information to the academic and postgraduate community;
- additional industry investment in research training, in particular, through the Melbourne Research Scholarships Program, the CRCs Program, the ARC Centres of Excellence Program and the ARC Linkage Scheme; and
- intellectual property developments leading to innovation outcomes and increased investment in Research and Development, particularly through involvement with established small, medium and large enterprises and with start-up companies.

In order to facilitate competitive bidding for major research initiatives sponsored by State and Federal governments, such as research centres, sophisticated equipment and other enabling infrastructure facilities, it is often necessary for the University to make a significant financial commitment. Following successful outcomes, financial returns can be expected from the performance-based Federal Government IGS, RTS and RIBG Scheme.

2004 Targets

- Evaluate the effectiveness of the Investment in Major Bids strategy approved by the PBC in June 2003 relating to the faculties' support for major competitive bids of more than $1 million where a University cash contribution is required by the funding agency.
  Accountability: DVCR.
- Increase participation and success rates in the ARC LIEF Program across all faculties.
  Accountability: DVCR and Deans.
- Academic departments to report progress to Deans on improving infrastructure support available to research students.
  Accountability: Heads of Departments/Deans.

The University will seek to increase its role in post-doctoral training programs. Post-doctoral fellows make a very valuable contribution to enhancing the research profile of the University.

Faculties will be encouraged to identify new post-doctoral fellowship opportunities where possible.

5.6 Funding for Research

Strategies

- Through a combination of faculty-based and centrally funded schemes, position Melbourne researchers to be more competitive in gaining external research funds.
- Place a high priority on the growth of external funding for research and research education, from both government and industry.

5.6.1 Internal

Internal funding available for the direct costs of research programs is limited as the principal commitments of the University are to staff salaries and to making a substantial contribution to research services and facilities. Infrastructure resources such as serviced laboratories, information resources, animal houses and special equipment are vital for achieving desired outcomes. These are rarely provided for by external funding bodies and are therefore priority items for the limited internal funds available.

The University will provide direct support for research and Research education programs through faculty-based and centrally-based sponsored schemes. Some of the scholarship schemes will be administered on the basis of joint-funding between a faculty and the centre. Obtaining increased external funding for research scholarships will be a priority.

The University will seek to increase its role in post-doctoral training programs. Post-doctoral fellows make a very valuable contribution to enhancing the research profile of the University. An increase in post-doctoral training opportunities is sought, however, financial support must come principally from external sources. Faculties will be encouraged to identify new post-doctoral fellowship opportunities.

The University will seek to gain leverage from its targeted investment in research through enhancement of its success in winning external research support. Priority areas for funding will be as follows:

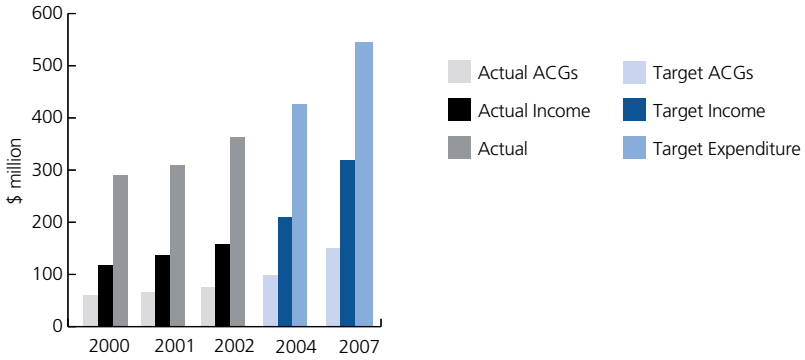
- research scholarships (matching with faculties or external bodies);
- early career research grants (matching with faculties);
- competitive seeding research grants for teaching and research staff;
- national and international collaborative linkage grants;
- research grant preparation awards;
- HDR academic and leadership extension programs;
- research mentoring development awards;
- career interruption research initiatives;
- major equipment awards (matching with external bodies);
- provisional patent support grants (matching with departments or faculties); and
- publication grants (matching with departments or faculties).

DEST funding for research training and research infrastructure is based upon relative national research performance in the RTS, the IGS and the RIBG Scheme. The University will have regard to the R&RT performance by faculties when allocating funds to support academic activities as part of the annual budget process. It is University policy to provide all RIBG funding to faculties on an as-earned basis. A substantial proportion of RTS and IGS funding will also be provided on the basis of performance having regard to the University objective of nurturing research excellence across all disciplines. Eligible staff in affiliated institutions that contribute directly to the University research profile will be assisted to strengthen their research activities.

2004 Targets

- Increase the participation in Australian Competitive Grant schemes. *Accountability: DVCR and Deans.*
- Provide funding for the Early Career Researcher Scheme and for the development of major bids to position researchers to be more competitive in gaining external support for research programs. *Accountability: DVCR.*

Figure 3. The University of Melbourne Total Research Expenditure, Research Income and Australian Competitive Grants (ACGs)



5.6.2 External

National and international competitiveness in winning research funding is central to achieving the mission of the University. Professional support services will be provided to facilitate the bidding by academic staff for external research funding.

The internal funding schemes are designed principally to achieve this result. A particular focus is the maintenance of a strong performance in Australian Competitive Grant Schemes, especially the ARC and NHMRC.

In recognition of government policy shifts to concentrate research efforts and to build a critical mass of expertise in priority areas, University services will be increased to facilitate competitive bidding for major collaborative programs such as Centres of Excellence, State Innovation Infrastructure and CRCs.

Academic staff will be supported in their endeavours by specialist staff within the MRIO, University Legal Services, Faculty Offices and Melbourne University Private Limited.

2004 Targets

- Achieve an increase of 15% in the value of Australian Competitive Grant income awarded in 2004 for 2005 by the ARC and the NHMRC.
  Accountability: DVCR and Deans.
- Achieve a 10% increase in research income per research-active member of academic staff (2003 research data).
  Accountability: DVCR and Deans.

5.7 Collaboration and Partnerships

Strategies

- Encourage the formation of partnerships to enhance the quantity and quality of research experiences and outcomes.
- Identify and support opportunities for international collaboration in research and research education through improved communications with staff and research students.

A priority within the 'Melbourne Agenda' is to seek new partners and to strengthen existing alliances for mutual benefit. Productive partnerships will be sought with universities, research organisations and industry as well as with policy and funding agencies at regional, national and international levels.

Mechanisms that will be used to achieve desired outcomes include:

- affiliation agreements with major research institutions;
- bilateral Memoranda of Cooperation agreements with international institutions;
- *Universitas 21* consortia;
- agreements for shared access to equipment and facilities;
- national and international visiting researcher programs;
- staff and student exchanges;
- seed-funding of collaborative research ventures;
- multi-party bids for programs such as Major National Research Facilities, ARC LIEF and Centres of Excellence; and
- formation of, and participation in, research consortia such as Neurosciences Victoria, Victorian Partnership for Advanced Computing, and the National ICT Institute (NICTA).

2004 Targets

- Subject to selection outcomes, successfully establish University involvement in the DEST International Centres of Excellence in Water Resources Management, Mathematics Education, and Sports Science and Administration.
  Accountability: DVCR and Deans.
- Achieve success as a significant partner in at least five of the 15 new ARC Research Networks.
  Accountability: DVCR and Deans.
- Participate strongly in the 2004 Selection Round of the CRCs Program.
  Accountability: DVCR and Deans.

The University will seek to establish an environment to stimulate its members, both staff and students, to create, protect and develop new knowledge for the benefit of the Australian community.

5.8 Intellectual Property and Innovation

Strategy

- Encourage staff and students to protect and develop new knowledge for the benefit of the Australian community.

The University will seek to establish an environment to stimulate its members, both staff and students, to create, protect and develop new knowledge for the benefit of the Australian community. An IP policy (http://www.unimelb.edu.au/ExecServ/Statutes/s141.htm) has been adopted to increase the incentives for academic staff as creators to be more proactive in the commercialisation of research outcomes, while protecting the rights of the University, students and outside investors who have a legitimate interest in the research outcomes. The implementation of this policy will be regularly monitored.

University members will be assisted in the innovation process by staff in the MRIO and by the IP Officer. A register of Technology Transfer Services provided by external bodies will be maintained. Options available to staff, at their discretion, include the services of Melbourne University Private Limited, the commercialisation resources of Uniseed Limited, Biocomm Limited or other bodies. The University will provide assistance to staff to secure provisional patent protection on the advice of the Head of Department and the IP Officer.

2004 Targets

- Establish an Industry Liaison Group as a 'one-stop shop' for research and innovation services supporting IP management, invention disclosure and assessment, and the commercialisation of research IP and multimedia products.
  Accountability: DVCR.
- Establish a new IP Management and Commercialisation Roundtable, chaired by the Director, MRIO, to enhance planning and service coordination by faculties, the administration, *Bio21* Molecular Science and Biotechnology Institute and Melbourne University Private Limited.
  Accountability: DVCR.
- Establish an Invention Disclosure Register.
  Accountability: Director, MRIO.
- Successfully establish the new University of Melbourne Expertise and International Linkages Profile System.
  Accountability: VP (Human Resources), VP (University Development) and DVCR.

5.9 Research Integrity and Compliance

Strategy

- Maintaining the highest ethical standards in compliance with internal and external regulations or codes of research practice.

The University will seek to maintain the highest standards of ethical and regulatory compliance for all its research activities by staff and students. The Melbourne Code of Conduct for Research and other Council Regulations will be regularly reviewed to ensure that they prescribe standards of research work performance and ethical conduct expected of all persons engaged in research at the University consistent with community expectations. All researchers will be required to manage their research programs to maintain compliance with University regulations.

The University Compliance Officer, the DVCR, the Risk Management Committee and the Internal Auditor will be engaged in monitoring performance. Matters such as research integrity, conflict of interest management, the involvement of human subjects in research, animal welfare and experimentation, biosafety and gene technology, privacy, financial management, occupational health and safety, environmental management, competition policy and trade practices will all be subject to close monitoring.

To ensure compliance with Government Competition Policy, the University will regularly review its costing and pricing policies for research. Researchers are required to seek to recover a proportion of the research facilities and services costs as outlined in the University policy document on Costing and Pricing for Research (http://www.research.unimelb.edu.au/ncp/).

2004 Target

- Increase the awareness of staff and students regarding their ethical compliance responsibilities through increased participation in training seminars and improved web-based information.
  Accountability: Deans and Heads of Departments.

5.10 Promotion of Research

Strategy

- Promote the research achievements of the University to national and international communities.

Research achievements will be promoted using the various channels available both within and outside the University, including an increased use of internet-based dissemination. The goal is to highlight the excellence of the scholarship being pursued and to underline the benefits to external providers of forging strategic partnerships with the University.

Some of the initiatives to be taken include:

- regular research features in UniNews;
- annual production of a quality magazine-style report on research highlights;
- encouragement of external news media to report University research breakthroughs;
- profiling the achievements of University research leaders;
- highlight reports to the community of grant awards and other research successes;
- discipline-based conference presentations by staff to report new research findings;
- invitations to distinguished researchers to participate in events such as the Dean's lecture series; and
- acknowledgement of research prizes and awards by staff and students.

2004 Targets

- Gain increased community acknowledgement for the quality research outcomes produced by University members through an increase in media releases on research achievements.
  Accountability: VP (University Development).
- Publish the *Research Annual Review* online.
  Accountability: VP (University Development).
- Update the University Media Strategy for the dissemination of research achievements.
  Accountability: Director, MRIO and Manager (Office of Media and Publication Service).

6. Research Management Support

6.1 Academic Leadership

Heads of Departments, Directors of research centres and Deans of faculties are expected to exercise leadership in establishing the research profiles for the disciplines within their jurisdiction and, in facilitating quality research outcomes. The DVCR has prime responsibility for advising on research policy and for providing accountability for the University R&RT performance in collaboration with the Dean of Graduate Studies. The PBC Research Sub-Committee, the RAGS Committee, the Research Higher Degrees Committee and the Melbourne Scholarships Committee are important structures through which the broader academic community engage in providing research direction for the University. Most faculties have an Associate Dean responsible for R&RT matters through which research leadership will also be exercised.

6.2 Administrative Support

The University maintains an MRIO and SGS to support the development of its research profile. Several other offices, including Human Resources, Financial Operations, Legal Services, Scholarships, Information Division (including Library), International and Student Services also provide support to deliver the R&RT services required. A number of faculties provide specialist administrative support to assist in the management of, and accountability for, the faculty research profile. These are enabling structures designed to create an environment within which internationally-competitive research can be nurtured.

Appendices

Appendix 1:

Attributes of a Melbourne Research Graduate

1.1 Research Masters Graduate

Research Masters degrees at the University of Melbourne seek to develop graduates who have a capacity for defining and managing a research project characterised by originality and independence. Their training equips them for more sustained and original work at the doctoral level or for applied research positions in a wide variety of contexts.

The University expects its Research Masters graduates to have the following qualities and skills:

- an ability to initiate research projects and to formulate viable research questions;
- a demonstrated capacity to design, conduct and report independent and original research on a closely-defined project;
- an ability to manage time to maximise the quality of research;
- an understanding of the major contours of international research in the research area;
- a capacity for critical evaluation of relevant scholarly literature;
- well-developed and flexible problem-solving abilities appropriate to the discipline;
- the ability to analyse research data within a changing disciplinary environment;
- the capacity to communicate effectively the results of research and scholarship by oral and written communication;
- an understanding of and facility with scholarly conventions in the discipline area;
- a profound respect for truth and intellectual integrity, and for the ethics of research and scholarship;
- a capacity to cooperate with other researchers; and
- an ability to manage information effectively, including the application of computer systems and software where appropriate to the student's field of study.

1.2 Doctoral Graduate

Doctoral degrees at the University of Melbourne seek to develop graduates who demonstrate academic leadership, increasing independence, creativity and innovation in their research work. In addition, professional doctoral studies provide advanced training designed to enhance professional knowledge in a specialist area, and encourage the acquisition of a wide range of advanced and transferable skills.

The University expects its Doctoral graduates to have the following qualities and skills:

- an advanced ability to initiate research and to formulate viable research questions;
- a demonstrated capacity to design, conduct and report sustained and original research;
- the capacity to contextualise research within an international corpus of specialist knowledge;
- an advanced ability to evaluate and synthesise research-based and scholarly literature;
- an advanced understanding of key disciplinary and multi-disciplinary norms and perspectives relevant to the field;
- highly developed problem-solving abilities and flexibility of approach;
- the ability to analyse critically within and across a changing disciplinary environment;
- the capacity to disseminate the results of research and scholarship by oral and written communication to a variety of audiences;
- a capacity to cooperate with and respect the contributions of fellow researchers and scholars;

- a profound respect for truth and intellectual integrity, and for the ethics of research and scholarship;
- an advanced facility in the management of information, including the application of computer systems and software where appropriate to the student's field of study;
- an understanding of the relevance and value of their research to national and international communities of scholars and collaborators;
- an awareness where appropriate of issues related to intellectual property management and the commercialisation of innovation; and
- an ability to formulate applications to relevant agencies, such as funding bodies and ethics committees.

Appendix 2:

Research Sub-Committee of the Planning and Budget Committee

2.1 Terms of Reference

1. To advise on planning issues related to R&RT including the development of an annual R&RT Plan for the University.
2. To recommend on strategic responses to major government initiatives in research policy and funding and their budget implications.
3. To recommend allocation priorities for the funding of research-related activities.
4. To coordinate and facilitate the advice of specialist committees on compliance with statutory requirements in the areas of animal experimentation and welfare, human research and biohazards, and through the PBC, report any compliance recommendations to the Academic Board and to Council.
5. To receive advice from the RAGS Committee on any matters relating to R&RT.

Appendix 3:

Research and Graduate Studies Committee of the Academic Board

3.1 Terms of Reference

1. To advise the Academic Board on policy matters relating to research and graduate studies, taking into account national and international developments and best practice in order to ensure that R&RT programs are of the highest quality and standards.
2. To provide advice to the PBC through its Research Sub-Committee on any matter related to R&RT.
3. To monitor research performance and the quality of HDR programs, using national and international benchmarking where appropriate, and to make recommendations to the Academic Board.
4. To consider and coordinate recommendations and advice from the Research Higher Degrees Committee and Postgraduate Scholarships Committee and to convey reports from these committees to the Board.
5. To provide advice to the Dean of Graduate Studies on policy relating to the research training and graduate programs administered through the SGS, in order to ensure that such programs are of the highest quality and standards.
6. To monitor and review the Code of Conduct for Research.
7. To recommend the establishment of such committees and sub-committees as may be required from time to time.
8. To receive reports from, and keep under review the terms of reference and membership of its committees and sub-committees and the committees that report through it.

Appendix 4:

International Research Strengths

The University of Melbourne has a very broad profile of research strengths that is demonstrably nationally competitive. Within this profile, nine areas of international research strength that represent major priority areas for the University have been selected. The selection is based on a combination of the following performance criteria:

- the eminence of research leadership;
- the level of external funding support;
- the strength of and output from research training activities;
- the extent and quality of international publications and patents;
- the breadth of peer review recognition through plenary lectures and awards; and
- the range of research collaborations and strategic partnerships established.

A feature of the Melbourne Research Profile is that approximately 40% of the research activities are in cross-disciplinary areas.

The highest ranked research strengths at internationally competitive levels in alphabetical order are:

Advanced Materials Science and Engineering

The major emphasis in this area is the creation of a range of novel materials with biological and industrial uses. Researchers in Chemistry, Chemical and Biomolecular Engineering, Biochemistry and Botany are combining with the support of the CRC for Bioproducts and the ARC Special Research Centre (SRC) for Particulate Fluids Processing to produce biocompatible materials based on innovative nano-technologies. Dental Science has developed bio-materials with the mechanical properties of teeth. Research on novel non-Newtonian fluids and intelligent polymers have been strongly supported by industry. Minerals processing and metals refining have been core activities. Novel wood product research is the basis for the CRC Wood Innovations. Researchers in all these areas have strong national and international strategic partners.

Curriculum, Learning and Policy in Education

Research on the various stages of learning – early and middle years, post-compulsory education and training, and higher education – and on curriculum and educational policy development, especially in language, literacy and mathematics, youth research, school leadership and assessment and evaluation is program of significant international importance. The Centre for the Study of Higher Education has made a major contribution to education policy studies. Research on children with high intellectual potential is conducted through the Morgan Centre.

Economic and Financial Analysis, Corporate Regulation

Economists and finance analysts have combined to place a major emphasis on theoretical and applied economics and financial analysis on many aspects of the Australian economy and social services. Policy orientated research is undertaken in the Melbourne Institute of Applied Economic and Social Research and the Departments of Economics and Finance. Areas include taxation and welfare, higher education, labour markets, econometrics and health economics. The Centre for Corporate Law and Securities Regulation is a key participant. Strong links exist with Government departments and business for forecasting, economic modelling and securities investigations.

Fundamental Sciences

Leading-edge fundamental research programs relate to the synthesis and characterisation of complex molecules, x-ray and neutron optics, astronomy, condensed matter physics, surface and interface studies, geophysics and geochemistry. The University has a commitment to preserve a strong international research presence in the basic enabling sciences for the advancement of fundamental scientific discoveries as central pillars to support excellence in more applied areas.

Historical Studies, Policy, Culture and Society

Fundamental to the very nature of a major university must be a strong commitment to the humanities and the social sciences, to exploring cultural traditions and societal challenges and changes, as well as proposing new paradigms and policy approaches. International distinction in this area crosses faculties, including Arts, Music, Law, Economics and Commerce, and Architecture, Building and Planning. It also spans departmental boundaries. Strengths include historical and urban studies, work on literature, art and music, languages and philosophy. A priority area is research in the Asia-Pacific region encompassing the Asian Law Centre, business, the Melbourne Institute of Asian Languages and Societies, environmental management and sustainability, comparative land and resource management and international law. The Australian Centre provides a focus for multidisciplinary studies of Australian Society. There is a highly regarded public policy research base in key areas such as criminology, politics, social work, urban planning and in the ARC SRC Centre for Applied Philosophy and Public Ethics.

Human and Veterinary Medicines

This is an area of central importance to the University *Bio21* initiative with the prospect of discovering and developing new protein and medicinal chemical pharmaceuticals for human and veterinary use. It is a multidisciplinary research area of excellence involving several expert groups. Bioprospecting, functional genomics, medicinal and natural product chemistry groups are located in Biochemistry and Molecular Biology, Chemistry and Pharmacology. Immunological Studies and Vaccine Research are pursued in Microbiology and Immunology, Veterinary Science and by groups collaborating with affiliated Medical Research Institutes. Exploratory drug discovery and industry-sponsored drug development groups in Pharmacology and combinatorial chemistry and bioinformatics groups in various departments form part of this focused effort. The research impacts on such areas as cardiovascular and respiratory science, neuroscience, parasitology, endocrinology and immunology.

Information, Mathematical and Communication Sciences

Telecommunications, photonics and signal processing are fields where leading-edge research with international recognition is being pursued. Two CRCs (Australian Photonics and Sensor Signal and Information Processing) together with an ARC SRC (Ultra-Broadband Information Networks) are focal points for research concentration. Major research activities involving mathematical, computer science and software engineering expertise in the fields of declarative programming, artificial intelligence, information retrieval and knowledge management database systems complement the research in Electrical and Electronic Engineering.

Neurological Sciences

Research to investigate various neurological functions of the brain is frontier science being pursued by expert teams from a number of perspectives. Researchers are at the forefront in areas such as ageing, stroke, Alzheimer's, Parkinson's and other neuro-degenerative diseases. Magnetic Resonance Imaging collaborations with the Howard Florey Research Institute and the Austin Brain Imaging Research Institute are providing new insights into the structure and functioning of the brain. A Neurosciences Victoria consortium has been formed. Hearing research is conducted in partnership with the CRC for Cochlear Implant and Hearing Aid Innovation and the Bionic Ear Institute. Psychological studies and psychiatric research complement the functional neuroimaging work.

Plant and Animal Biotechnological Sciences

Significant strengths have been established in plant biology, particularly in the fields of molecular and cellular biology and the chemistry of complex carbohydrates. A CRC for Bioproducts linked to the School of Botany and Department of Chemical and Biomolecular Engineering is the focus for much of the activities in this area. Genetic modification of food products, especially cereal crops and pastures, to improve pest resistance, yield and quality is the major emphasis of collaborative research in agriculture, including at the Joint Centre for Crop Innovation. Equine Virology, Zoological Studies and Animal Biotechnology are key areas with strong industry and international collaborations. Animal nutrition research is directed at obtaining improved quality in food production.

Postera Crescam Laude

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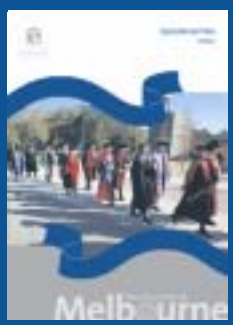
Publications which cover the University of Melbourne's goals, strategies, management and operations

Strategic Plan Perspective 2003

Ensuring Accountability 2002

Teaching and Learning Management Plan 2004



Operational Plan 2004

Annual Report 2002

Research and Research Training Plan 2004

Annual Budget 2004

Annual Review 2002

The 'Melbourne Agenda'

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