



The University
of Melbourne

2005

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Our Cover

Nobel Laureate Professor Peter Doherty (centre) and his team are currently undertaking important research concerning immunity to influenza and AIDS. From left, Mrs Dina Stockwell, Dr Jing Pi, Dr Katherine Kedzierska, Dr John Stambas, Dr Nicole La Gruta, Misty Jenkins and Dr Stephen Turner.

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Acronyms

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

This Plan defines strategies and targets to strengthen the University's performance and reputation as a major international research-led university.

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



Preface

Research and Research Training are integral parts of the fabric of a university of international standing. The reputation of the institution often is established, sustained and enhanced through research achievement of international significance. The *Research and Research Training Plan* for the University of Melbourne is formulated within the aspirational goal of the University being recognised as one of the finest in the world.

The Plan is part of the University's annual planning cycle and is a companion document to the *Teaching and Learning Management Plan*. It elaborates on the priorities set within the University *Strategic and Operational Plans*, taking into account National Research Priorities when fostering University research strengths and developing new initiatives.

Strategies and targets are defined to strengthen the University's performance and reputation as a major international research-led university. The Plan provides the framework to enhance the excellence of our research and research training and so attract high quality postgraduate students, nationally and internationally, to be mentored by academic staff of distinction.

Through the Plan the University seeks to acknowledge its responsibilities to enhance the intellectual endeavour and practical skills of researchers and to establish effective mechanisms for knowledge transfer for public good and private gain. Innovation and commercialisation now feature alongside the fundamental core University values of freedom of intellectual inquiry, discovery and dissemination of new knowledge.

Visions, articulated through plans, become reality only through the talent and dedication of people. These qualities are essential for achieving the desired outcomes of this *Research and Research Training Plan*. The staff and students of the University of Melbourne have such qualities.

A handwritten signature in black ink that reads "Frank P. Larkins". The signature is fluid and cursive.

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

Research and Research Training



1. Mission

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

2. Goal

The key research goal identified in the University's Strategic Plan is to *strengthen 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.*

3. Objective of the Research & 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 and research training:

- nurturing research excellence across all disciplines to support quality teaching and learning programs, while maintaining high ethical standards;
- providing a stimulating environment for research education and training activities so that students achieve the attributes desired of Melbourne research graduates (Appendix 1);
- promoting innovative research initiatives through incentives and rewards that lead to international quality outcomes in skills and new knowledge;
- fostering 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;
- contributing economic and social value through the transfer of ideas and technologies to produce new products, policies, processes and services; and
- recognising achievements by staff and students in research through performance-based funding and reward mechanisms.

4. Policy Setting Framework

The University Council is advised on R&RT policies by the R&RT Committee through the Academic Board and PBC (Appendix 2, 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 develop their discipline-orientated plans within this framework. These plans provide the basis for annual reviews of performance at various levels in the University.

At left: A study by University scientists has provided the first direct evidence that differences in the way the surface of the human brain is folded could be an indication of a person's intellectual ability. From left, Dr Tina Proffitt and Dr Stephen Wood, PhD candidate Mr Alex Fornito and Dr Murat Yucel with images of folds in the brain.

The University seeks to improve its research profile by:

- significantly increasing its resource base;
- attracting and retaining high quality staff;
- setting targets to achieve quality outcomes;
- 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 & Research Training 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 consistent with National Research Priorities (Appendix 4), in which the University has achieved 'critical mass' capability, or enjoys demonstrable strategic opportunities or comparative advantages.

This Plan and the more broadly based University *Operational Plan* identify short-term targets for R&RT performance. Council has also approved a limited number of longer term performance objectives (published in the *Strategic Plan*). Institution-wide targets with incentives and rewards have been set for improvements in per capita research performance, research income, industry linkages and higher degree enrolments, together with research development plans and plan-driven, performance-based budgeting at University and faculty levels. These targets are revised annually and together with a review of performance for the previous year are submitted to the University Council for approval. Increasing emphasis is being placed on systematic benchmarking of research performance against the highest international standards, on continuous improvement, and on demonstrating the public benefit of University research.

R&RT performance is a major focus of the Annual Operational Performance Review conducted between faculty executives and members of the Senior Executive. Faculty progress against University targets and faculty plans are discussed along with significant issues for the faculty within the planning period.

Research Centres form an important part of the University plan to concentrate research effort and to build critical mass in priority areas.

The University has more than 6,000 researchers, including over 4,000 higher degree research students. 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;
- the range of research collaborations and strategic partnerships established; and
- the relevance to National Research Priorities.

These criteria will form the basis for selection of the major research strengths reported to DEST as part of the R&RT Management Report. 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 3. 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.

Some recent initiatives that have been taken to position the University to further enhance its research performance in future years include the establishment of:

- the Melbourne Water Research Centre;
- the Intellectual Property Research Institute of Australia;
- a Victorian node of National ICT Australia (NICTA);

- the Centre for Cultural Materials Conservation;
- the Bio21 Molecular Science and Biotechnology Institute;
- the Centre of Excellence in Mathematical and Statistical Modelling of Complex Systems;
- the Centre for Perceptive and Intelligent Machines;
- a partnership arrangement with Neurosciences Victoria;
- the Asia-Pacific Centre for Military Law;
- the Centre for Nanoscience and Nanotechnology; and
- the Centre for Biomedical Engineering.

2005 Targets

- Successfully establish the new R&RT Committee to provide comprehensive, high quality advice to the Academic Board and PBC on strategic directions and quality.

Accountability: DVCR, Dean, SGS & President of Academic Board.

- The R&RT Committee, in consultation with Associate Deans (Research and Research Training), to review the coherence between University and faculty-level R&RT Plans and advise on the degree to which the faculties' plans give effect to key University targets.

Accountability: Chair, R&RT Committee.

- Report on the first full year of operation of the Bio21 Molecular Science and Biotechnology Institute (Bio21 Institute), demonstrating that the Bio21 Institute is well placed to achieve by the end of 2006 new research income of at least \$10 million and, in association with participating faculties, an HDR load of 100.

Accountability: Director, Bio21 Institute.

- Successfully establish new initiatives supported by the next round of Victorian Government Science, Technology and Innovation (STI) Program Grants.

Accountability: DVCR and Deans.

- Analyse and report on the University's profile using the new National Citation Data (from Thomson Scientific), including publications, citations and impact factors by field, and further assess current and emerging strengths.

Accountability: DVCR.

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.

Academic Board policy on quality assurance in research is to maximise quality through a strategic focus on people, physical infrastructure and resources, and management, and also to emphasise ongoing target setting, performance evaluation and systematic re-planning, remediation and quality improvement.

The key central, University-wide performance parameters are:

- external research income (all sources);
- Australian Competitive Grant performance;
- research publications (University collection);
- Group of Seven (GO7) Research Performance Benchmarking Project data;
- HDR data (load, completions and PhD outcomes (including completion time and rates, examiners' category 1 to 6 recommendations and the examiners used)); and
- research student experience (Postgraduate Research Experience Questionnaire, and Quality of Research

Supervision and Academic Support (University Evaluation Cycle survey)). In addition, faculties and departments are required to define how they wish to be assessed, that is, the measures of research quality and performance they consider are most appropriate, and to present relevant data. It is important that faculties and departments show how such analyses are informing policy and practice and feeding into a cycle of continuous improvement.

Melbourne benchmarks its R&RT performance university-wide across Australia using principally DEST data for key research parameters. Table 1 records the University's performance over recent years in areas identified by the commonwealth as key indices of research performance. Based on DEST information the Table indicates the University's national ranking within the Australian higher education sector on each performance measure. Since 2000 the University has been ranked first on each parameter.

An international benchmarking instrument has been developed and implemented by the School of Graduate Studies to assess the quality of research training policies and processes. Results of this survey identify areas of good practice and opportunities for further development. Performance at the faculty and departmental levels is benchmarked against the GO7 Australian research-intensive Universities on an annual basis. Where faculty performance is below average, discussions will be held with the relevant dean and senior faculty staff and explanations and corrective actions sought.

Year*	Total HDR Load (ResDoc+MRes) (EFTSU)	HDR Completions (ResDoc+MRes) (Number)	Australian Competitive Research Grants (\$m)	Total Research Income (\$m)	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 (1)	74.8 (1)	158.8 (1)	2,855 (1)
2003	2,925 (1)	694	87.2	198.7	2,858

Notes

1. For all years, the national ranking is given in parenthesis.
2. The ranking for 2003 is known for one parameter only.
3. For 2002 and 2003, the ARC LIEF Grant income is not included.

A similar analysis is provided to deans to evaluate departmental performance. Summary reports will be provided to Academic Board and Council, and R&RT is one of the areas addressed in comprehensive reports to Council against all University goals and targets. Staff performance is monitored at all levels (individual researcher, head of department, department, dean, faculty and university-wide) as part of the approach by the University to Ensuring Accountability. The Human Resources Performance Development Framework provides an opportunity for heads of departments to:

- (i) appraise individual staff performance on such matters as level of research activity, research supervision and research ethics compliance issues; and
- (ii) set objectives and review career development and support plans.

All staff, including heads of departments and deans take part in this process.

The R&RT Committee 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 R&RT 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 having regard to the quality as well as the quantity of outcomes.

Quality assurance mechanisms have also been adopted with regard to research and research training management and services. Customer satisfaction surveys are conducted annually

involving deans, heads of departments, students and senior staff on the Quality of University Management and Administration. Research is one of the highest rated areas in terms of importance and customer satisfaction. Student perceptions of the quality of supervision and academic support are also monitored through annual surveys. All academic support groups take part in annual quality self-assessments, the Operational Performance Review and five yearly reviews of departments.

2005 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 (with the G07 project expanded to include ANU) and outline in their Operational Performance Review submissions initiatives being taken to enhance performance outcomes.

Accountability: Deans

- Identify and monitor performance against faculty-specific HDR completion rate milestones.

Accountability: Dean of Graduate Studies and Deans

- Develop further mechanisms to monitor the attainment of the graduate attributes of research students.

Accountability: Dean of Graduate Studies

- Conduct at least four departmental audits of research training and utilise the results to identify and promote good practice throughout the University.

Accountability: Dean of Graduate Studies

- Report to Academic Board and Council demonstrating improvement in the research standing of the University as measured against internationally recognised indicators of research performance.

Accountability: DVCR

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

5.3 Staff Recruitment and Development

Strategies

- Attract, encourage and retain staff who excel in research and research training.
- 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.

The University must attract the very best researchers. Recruiting and retaining top academic staff will become increasingly competitive with a significant proportion of the Australian academic workforce expected to retire in the next ten years.

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 with other academic staff members being strongly encouraged to attend refresher courses. The *Eleven Practices of Effective Postgraduate Supervisors* developed by the University's Centre for the Study of Higher Education and the SGS will be promoted to academic departments and supervisors to provide strategies for the development of flourishing HDR teaching and learning environments.

(www.gradstudies.unimelb.edu.au/supervisors/publications/11practices.pdf)

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 will differ between the faculties, at the University level, the research activity of teaching and research staff of 0.5 FTE and above will be assessed over a three-year period. The minimum level of performance expected of a research active staff member will be publication of 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.

On the basis of these measures more than 85% of the designated staff are research active.

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 analysis will be provided to deans and heads of departments for staff development purposes. The next University-wide evaluation in this area will be conducted in 2006. Expected quantitative outcomes are presented in Section 5.5.

2005 Targets

- Evaluate the pilot Early Career Professional Development and Support Program for Academic Staff and, subject to results, seek to expand the Program.

Accountability: DVCR and V-P (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

5.4 Research Training

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 make a major contribution to the research profile of the University. It is important for research projects to be chosen that are compatible with the interest and academic capability of the student, commensurate with the expertise of the supervisor and achievable with a realistic time frame and 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.

2005 Targets

- Average completion rate of 70% for all full time commencing PhD students within five years of enrolment.

Accountability: Dean of Graduate Studies and Deans

- Research supervision satisfaction levels of at least 4.0 as indicated by research student satisfaction surveys.

Accountability: Dean of Graduate Studies and Deans

- Meet 2005 load targets for Australian HDR commencing and international HDR students.

Accountability: Deans

- Increase HDR enrolments by 3.5% from 3,100 EFTSU to 3,200 EFTSU.

Accountability: DVCR and Deans

Figure 1 The University of Melbourne Total Higher Degree Research Load

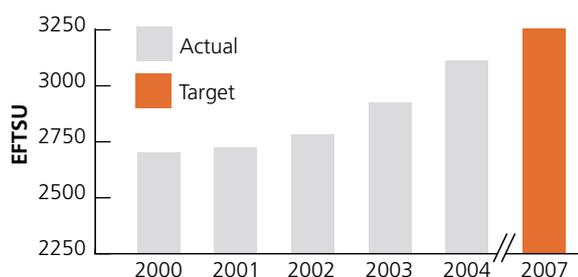
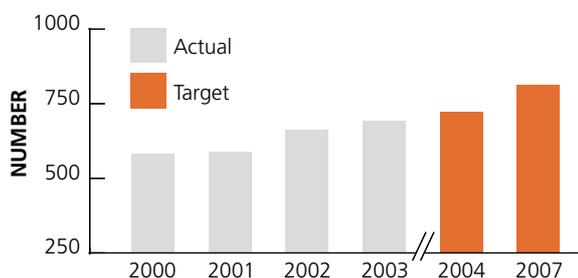


Figure 2 The University of Melbourne Total Higher Degree Research Completions



Quality R&RT outcomes require state-of-the-art infrastructure resources to underpin performance. Academic staff will be encouraged to form networks and strategic alliances to share expensive resources, and to bid for research infrastructure grants.

5.5 Infrastructure and Funding

Strategies

- Place a high priority on the growth of external funding for research, from both government and industry, and in particular on growth of national competitive research income.
- Through a combination of faculty-based and centrally-funded schemes, position Melbourne researchers to be more competitive in gaining external research funds including participating in major collaborative research programs. A strategic research initiative fund and a Melbourne research scholarships scheme will be used for this purpose.
- Upgrade the total quality space available for R&RT, through a combination of new resources and renovation of existing facilities within budget constraints.

National and international competitiveness in winning research funding is central to achieving the mission of the University. A particular focus is the maintenance of a strong performance in Australian Competitive Grant Schemes, especially the ARC and NHMRC. These schemes frequently form the foundation for major longer term collaborative bids.

Peer support and encouragement are crucial. Academic colleagues need to play a very active role in helping researchers, especially those less experienced in grant winning, to target the right opportunities, plan ahead, prepare drafts early and seek comments on successive drafts, and communicate clearly. Academic support and mentoring are vital. Senior academic staff, especially, also need to assist colleagues to develop their track records and be active in publishing, professional networks, conferences and other avenues to ensure their work is well known.

To complement this peer support, the University will provide expertise to facilitate the bidding by academic staff for external research funding, in particular through MRIO, University Legal Services, Faculty Offices and Melbourne Ventures Pty Ltd.

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. The University has made a series of major capital investments including University Square, the Bio21 Institute and the Dental School to further enhance its research profile and

comparative advantage in areas of strength and new opportunity. Academic staff will be encouraged to form networks and strategic alliances to share expensive resources, and to bid for research infrastructure grants.

Internal University-level funding schemes will be used to seed – fund new and promising initiatives, support early career researchers and encourage staff to continue with projects that were very close to being funded in major schemes and submit enhanced proposals. 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).

The University will continue to diversify the funding base for R&RT in order to advance its international performance and reputation.

In recognition of the valuable contribution which post-doctoral fellows make to enhance the research profile of the University, the University will seek to increase its role in providing post-doctoral training programs. Faculties also will be encouraged to identify new post-doctoral fellowship opportunities. Financial support will need to be principally from external sources.

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.

2005 Targets

- Achieve an increase of 40% in the value of Australian Competitive Grant income awarded in 2005 for 2006 over the funds awarded for 2004.

Accountability: DVCR

- Achieve an increase of 15% in the value of the total research income.

Accountability: DVCR and Deans.

- Achieve an increase of 20% in the number of early career researchers being awarded external grants.

Accountability: DVCR

- Achieve at least 5 new Federation Fellowship awards from the 2005 round.

Accountability: DVCR and Deans.

- Achieve a 10% increase in research income per research-active member of academic staff (based on 2003 research data).

Accountability: DVCR and Deans.

- Increase participation and success rates in the ARC LIEF Program across all faculties.

Accountability: DVCR and Deans.

- Successfully implement the Strategic Research Initiative Fund to increase major research bid success for projects greater than \$1million.

Accountability: DVCR and Deans.

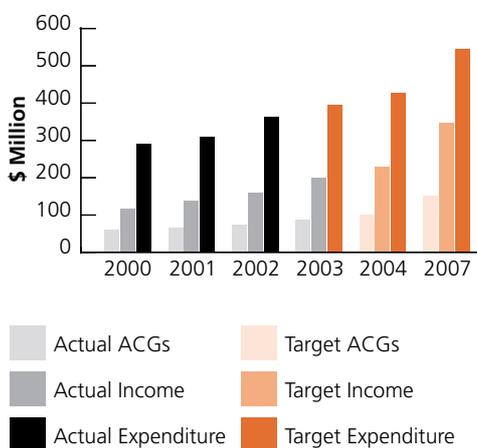
- Implement the 'Faculty Actions Plans to Increase Grant Income 2005-2006' and monitor the impact of this new planning initiative.

Accountability: DVCR and Associate Deans (RAGS).

- Deans to report in the 2005 Operational Performance Review on steps each faculty has taken to increase the degree of active collegial support and academic mentoring for staff, especially of less senior researchers, seeking to target grant schemes and prepare competitive applications.

Accountability: Deans.

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



Note: Income refers to DEST Research Income and does not include IGS, RTS or RIBG funding. Expenditure includes Land & Buildings, Vehicles & Other Equipment, Staff, HDR Scholarships and other current expenditure.

5.6 Collaboration and Partnerships

Strategies

- Actively identify and develop opportunities to engage Australian industry in collaborative research relationships.
- Foster enhanced linkages in research and research training with the major Publicly Funded Research Agencies, statutory authorities, government departments and key medical research institutes.
- Leverage the infrastructure of the Bio21 Institute to develop new collaborative relationships with commercial and academic partners in the biotechnology area.

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.

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;
- joint research training programs with like international research-led institutions;
- national and international visiting researcher programs;
- staff and student exchanges;
- seed-funding of collaborative research ventures;
- multi-party bids for programs such as CRCs, ARC LIEF and ARC Centres of Excellence;
- participation in, research consortia such as Neurosciences Victoria, Victorian Partnership for Advanced Computing, and the National ICT Institute (NICTA); and
- engagement in the Australian Synchrotron Project.

2005 Targets

- Achieve success as a significant partner in at least five of the ARC Research Networks.
Accountability: DVCR and Deans
- Involvement as a core participant in at least six new CRCs resulting from the 2004 Selection Round of the CRCs Program.
Accountability: DVCR and Deans
- Increase participation and success rates in the ARC Linkage-Projects Scheme in accord with the targets agreed by deans and heads of department in August 2004.
Accountability: DVCR, Deans and Director, MRIO

- Successfully establish the first stage of the Victorian node of the National ICT Institute (NICTA) at the University of Melbourne with at least 20 new research staff and 30 new HDR students.
Accountability: Dean, Faculty of Engineering

- Achieve a significant involvement in the design and development of beamlines for the Australian Synchrotron Project.
Accountability: DVCR and Deans, Faculties of Science, Engineering and MDHS

- Successfully establish a Strategic Alliance Agreement between the University and the Defence Science and Technology Organisation and report in December 2005 on the activities developed under this Alliance.
Accountability: DVCR

- Through the R&RT Committee, examine ways to encourage greater research collaboration between faculties and departments and between University staff and colleagues in affiliated institutions.
Accountability: DVCR

- Successfully commence 10 new significant relationships with Australian industry partners (a significant relationship is defined as engaging at least 3 FTE equivalent researchers for a calendar year).
Accountability: DVCR and Deans

- Achieve a 20% increase in Australian contract research income for 2006 (cf 2004 research data).
Accountability: DVCR and Deans

- Successfully establish the biotechnology business incubator in the new Bio21 Institute Building supporting start up companies through 'anchor tenants' and 'bench places' for external users of individual platform technology facilities.
Accountability: Director; Bio21 Institute

- Implement a standard Contract Research Agreement for sign-off by heads of department and deans to streamline interactions with government and industry.
Accountability: Director, MRIO

The University will seek to establish an environment to stimulate its members, both staff and students, to create, protect and develop new knowledge principally for public good.

5.7 Intellectual Property and Innovation

Strategies

- Encourage staff and students to protect and develop new knowledge principally for public good.
- Create an environment and support mechanisms to allow academics to participate in the National Innovation System.
- Develop and implement a comprehensive Commercialisation Strategy.
- Attract new sources of research income to the University (eg venture capital) by appropriately packaging and presenting technologies to the business community.

The University will seek to establish an environment to stimulate its members, both staff and students, to create, protect and develop new knowledge principally for public good. In order to provide incentive for such activity, the University will maintain a generous policy with regard to the distribution of the proceeds of commercialisation. In addition, the University will also seek to provide supporting resources to staff and students to assist them in packaging their innovations in a way that is attractive to external investors and partners.

The University has recently significantly increased its investment in commercialisation support, with the establishment of the position of Director of Commercialisation and Commercial Strategy and the creation of Melbourne Ventures Pty Ltd. They will work closely with MRIO to provide support to University members at all stages of the innovation pathway. MRIO has assumed responsibility for managing the University's patents and royalties, and its new Multimedia Licensing and Technology Contracts team assists staff with multimedia and ICT technology licensing. Melbourne Ventures Pty Ltd provides advice and guidance on issues relating to patenting and intellectual property protection, technology licensing, business planning, access to venture capital funding and start-up company formation. The University will also continue to support its investment in Uniseed as a way to ensure its early-stage technologies have access to capital, whilst also seeking to access external capital from funds such as the Federal Government's Pre-Seed funds.

2005 Targets

- Complete development of the University Commercialisation Strategy and implement required organisational and performance management strategies.
 - To develop University-wide and faculty-based commercialisation targets.

Accountability: Director, Commercialisation and Commercial Strategy

- Achieve 30 Invention Disclosures.

Accountability: Director, MRIO; Managing Director, Melbourne Ventures Pty Ltd

- Melbourne Ventures Pty Ltd to review at least 50 commercialisation opportunities from within the University and affiliates.

Accountability: Managing Director, Melbourne Ventures Pty Ltd

- Melbourne Ventures Pty Ltd to attract at least \$3million of additional funding into the development of University intellectual property (start-up companies, joint development agreements)

Accountability: Managing Director, Melbourne Ventures Pty Ltd

- Achieve participation by all faculties in "Expotech", the University's online showcase of technology solutions available for licensing, development and sales.

Accountability: Deans; Director, MRIO

- Establish the Knowledge Transfer and Industry Liaison Interest Group to enhance joint planning and cooperation and share best practice among the faculties, University Administration, Melbourne Ventures Pty Ltd and Melbourne University Private Limited.

Accountability: Director, Commercialisation and Commercial Strategy; Managing Director, Melbourne Ventures Pty Ltd; Director, MRIO; Faculty General Managers.

5.8 Research Integrity and Compliance

Strategy

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

The University has an obligation to its members and to the community to ensure compliance with the law in all its activities and contractual conditions agreed with R&RT sponsors and collaborators.

Ethical conduct and the pro-active assessment and management of risk are the foundation stones of the University Compliance Program. Compliance is closely monitored in the research-related areas of research integrity, conflict of interest, use of human participants in research, animal welfare, bio-safety and privacy, as well as financial management, occupational health and safety, competitive neutrality and trade practices. The University Compliance Officer, Risk Management Committee and Audit Committee play an important oversight role.

The Melbourne Code of Conduct for Research prescribes standards of work performance and ethical conduct expected of all persons engaged in research at the University. The Code incorporates a section on conflict of interest disclosure and management, supported by a comprehensive information and resources site. (<http://www.research.unimelb.edu.au/admin/res.conduct/code.html>).

All researchers are required to manage their research programs to maintain compliance with University regulations.

2005 Targets

- 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

Ethical conduct and the pro-active assessment and management of risk are the foundation stones of the University Compliance Program.

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.

5.9 Promotion of Research

Strategies

- Promote the research achievements of the University to national and international communities.
- Effectively communicate the University's contribution to the economic, social, cultural, intellectual and scientific development of Australia.

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;
- promotion of University research achievements at international education and trade fairs;
- 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;
- acknowledgement of research prizes and awards by staff and students; and
- features in international media of successful completion by overseas students of research higher degrees and relevant research outcomes.

2005 Targets

- Increased levels of internal customer satisfaction with the marketing and communication services provided by the Media and Publication Services Office.
Accountability: Senior Vice-Principal
- Report to the R&RT Committee twice yearly on media liaison activities and media coverage of R&RT related stories.
Accountability: Senior Vice-Principal
- Revise and enhance the high level pages on the University web site designed to highlight the benefits of the University R&RT progress.
Accountability: Director, MRIO

5.10 Leadership, Management and Support Services

Strategies

- Foster strong academic leadership in R&RT.
- Provide high quality academic support services and management information.

The DVCR is responsible on behalf of the University for overseeing R&RT matters at the University, in particular, coordinating the development and implementation of research policies, improving the support mechanisms for research, benchmarking and monitoring performance, establishing strategic inter-institutional linkages, facilitating knowledge creation and technology transfer and promoting University research capacity and outcomes to government, industry and the general community.

The Dean of Graduate Studies oversees postgraduate activities including quality assurance of research higher degrees, supervisor training, development of HDR policy, the monitoring of HDR progress and completions and the provision of postgraduate enrichment programs.

At the faculty level Associate Deans (Research and Research Training) (AD(R)), or equivalent, provide focussed leadership for research planning, target-setting, research development, performance review and coordination of graduate studies matters. 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 joint Academic Board and PBC R&RT Committee, its committees (including the Research Higher Degrees Committee) and the Melbourne Scholarships Policy Committee are important structures through which the broader academic community engages in providing research direction for the University.

The major University R&RT academic support services are the MRIO and the SGS. Several other offices, including Human Resources, Financial Operations, Legal Services, Scholarships, Information Division (including Library), and 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. Technology commercialisation services are provided by Melbourne Ventures Pty Ltd and by MRIO's Multimedia Licensing and Technology Contracts team. These are enabling structures designed to create an environment within which internationally-competitive research can be nurtured.

2005 Targets

- Enhance the role of Associate Deans in research leadership and management at a University-level including through a more active AD(R)s Committee, an AD(R)s representative on the R&RT Committee, and a dedicated AD(R)s web site and online discussion forum to facilitate the sharing of ideas and 'best practice'.

Accountability: DVCR, Deans and AD(R)s

- Lead the University Systems Project Research Management System (RMS) Project to improve IT systems for research administration, the delivery of services to researchers and the monitoring and reporting on research performance.

Accountability: DVCR, Director, USP and Director, MRIO

- Report in May 2005 and December 2005 on progress in implementing the Action Plan approved by PBC in response to the MRIO Department Review.

Accountability: Director, MRIO

- Implement the pilot Professional Development Program for Research Administrators.

Accountability: Director, MRIO; V-P (Human Resources); and Faculty General Managers

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 and Research Training Committee

2.1 Terms of Reference

1. To advise on planning issues related to research and research training including the development of an annual Research and Research Training Plan for the University.
2. To provide advice to PBC on the implications of major Government initiatives in research policy and funding and their budget implications and recommend changes to University strategic positioning, policy or procedures.
3. To recommend allocation priorities for the funding of research-related activities to the PBC.
4. To co-ordinate 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 PBC report any compliance recommendations to the Academic Board and to Council.
5. To monitor research performance and the quality of research higher degree programs, using national and international benchmarking where appropriate, and to make recommendations to the Academic Board in order to ensure that research and research training programs are of the highest quality and standards.
6. 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 Academic Board and PBC as appropriate.
7. To monitor and review the Code of Conduct for Research.
8. To recommend the establishment of such committees and sub-committees as may be required from time to time.
9. 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.

2.2 Chairperson

The Chairperson shall be appointed by Council on the advice of the Vice-Chancellor on the recommendation of the President of the Academic Board.

Appendix 3

International Research Strengths

The University of Melbourne has a very broad profile of research strengths that is demonstrably nationally competitive. Within this profile, ten 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;
- the range of research collaborations and strategic partnerships established; and
- the relevance to National Research Priorities.

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 has 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

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. Strong links exist with Government departments and business for forecasting, economic modelling and securities investigations.

Institutional Design and Analysis, Governance and Policy Implementation

The design and effective operation of public and private institutions are fundamental to Australia's social and economic well-being and to Australia's contribution to our region and the world. Strengths exist in constitutional studies, corporate law and securities regulation, employment and labour relations, human rights, media and communications, and military law. The Intellectual Property Research Institute of Australia (IPRIA) is a national centre of excellence for multidisciplinary research in intellectual property whose staff are research leaders with expertise in the legal, economic and management aspects of intellectual property.

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. Bio-prospecting, 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. A Victorian node of National ICT Australia 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. 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 neuro-imaging 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.

Appendix 4

National Research Priorities

Research Priority 1:

An Environmentally Sustainable Australia

Transforming the way we utilise our land, water, mineral and energy resources through a better understanding of human and environmental systems and the use of new technologies

Priority Goals

- Water – a critical resource
- Transforming existing industries
- Overcoming soil loss, salinity and acidity
- Reducing and capturing emissions in transport and energy generation
- Sustainable use of Australia's biodiversity
- Developing deep earth resources
- Responding to climate change and variability

Research Priority 2:

Promoting and Maintaining Good Health

Promoting good health and well being for all Australians

Priority Goals

- A healthy start to life
- Ageing well, ageing productively
- Preventive healthcare
- Strengthening Australia's social and economic fabric

Research Priority 3:

Frontier Technologies for Building and Transforming Australian Industries

Stimulating the growth of world-class Australian industries using innovative technologies developed from cutting-edge research

Priority Goals

- Breakthrough science
- Frontier technologies
- Advanced materials
- Smart information use
- Promoting an innovation culture and economy

Research Priority 4:

Safeguarding Australia

Safeguarding Australia from terrorism, crime, invasive diseases and pests, strengthening our understanding of Australia's place in the region and the world, and securing our infrastructure, particularly with respect to our digital systems

Priority Goals

- Critical infrastructure
- Understanding our region and the world
- Protecting Australia from invasive diseases and pests
- Protecting Australia from terrorism and crime
- Transformational defence technologies

The following suite of publications covers the University of Melbourne's goals, strategies, management and operations.

The 'Melbourne Agenda'

Strategic Plan Perspective

Operational Plan

Ensuring Accountability

Annual Report

Annual Review

Annual Budget

Teaching and Learning Management Plan

Research and Research Training Plan

Towards Environmental Sustainability

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growing in the esteem of future generations



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