

Research Repository Case Study: The University of Auckland Library, New Zealand

Prepared by Leonie Hayes – Research Repository Librarian

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Abstract

This case study outlines the organisational context, mission statement, underlying business drivers and implementation pathway for ResearchSpace, The University of Auckland's research repository. An outline of the institutional embedding and engagement activities along with the service sustainability issues and policy formation are addressed. The first years of activity from 2006 to 2008 and the move from pilot repository to repository service are described.

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1 Organisational Context

The University of Auckland is New Zealand's leading research-led University, the country's largest. It was established in 1883 and has 8 faculties, along with 30 interdisciplinary research clusters.

The University Library is responsible for ResearchSpace one of the digital library products at the University. ResearchSpace uses DSpace (Open Source Software) www.dspace.org, to manage the submission and storage of Digital Doctoral theses. This is being expanded to include other research outputs like conference papers, journal articles and working papers.

2 Mission Statement

ResearchSpace is an open access institutional repository. Its purpose is to showcase and preserve the research outputs of members of the University of Auckland.

3 Major Achievements

- Partnerships with other Universities in the Institutional Repositories Aotearoa (Ira) project.
- Partnerships within the University with the Information Technology Directorate and the Graduate Board of Studies.
- Team members awarded a General Staff Excellence Award in Innovation.
- Sustainability within the existing operational budget of the University Library.
- Institutional Embedding and Business Process Analysis.
- International exposure for Doctoral Level Research undertaken at the University of Auckland.

4 Pilot Repository to Repository Service

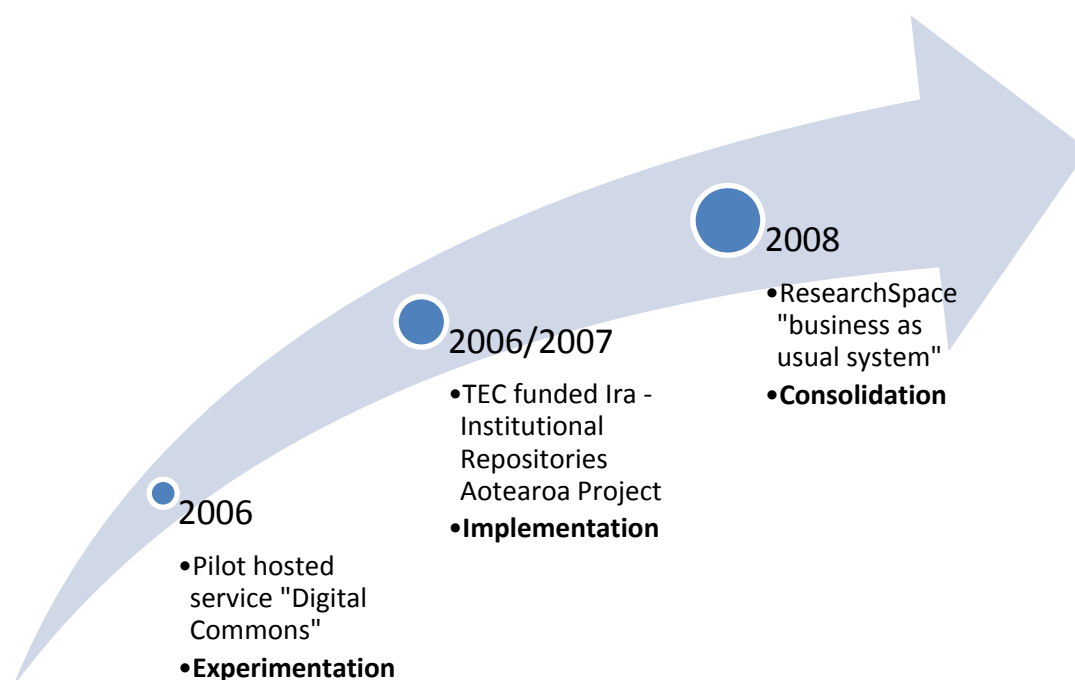


Figure 1 : Timeline

In 2006 the University Library tested a hosted repository service “Digital Commons” offered by Proquest – a library database vendor. It was decided not to continue with this service in late 2006 for the following reasons:

1. Hosting at the University of Auckland was preferable due to the Intellectual content of the material.
2. Support and documentation for Digital Commons was inconsistent and patchy.
3. Flexibility to expand content formats was not well catered for.
4. Projected future costs, based on annual subscriptions did not demonstrate value for money.

During the 2006/2007 year the University of Auckland Library was successful in obtaining seed funding from the New Zealand Tertiary Education Commission (TEC) to set up pilot repository services in partnership with the University of Canterbury and Victoria University of Wellington.

The collaboration was named Institutional Repositories Aotearoa (Ira)) www.ira.auckland.ac.nz .The project recruited the services of a programmer/developer for the installation and customisation of DSpace for the three partner institutions for a one year period - 2006/07.

ResearchSpace as a system and service began life during this period as a repository for digital PhD theses produced at the University of Auckland. Doctoral theses were considered a useful showcase collection for the project. PhD theses contain high value research, unique material about the New Zealand and Pacific region, previously unpublished material and material useful in teaching and learning.

The necessary consents, copyright clearances and licensing options were addressed at the statutory level in the University including amendments to allow for online submission of digital copies of PhD theses. The Library implemented the service during 2007 on behalf of the Board of Graduate Studies.

The DSpace software is Open Source and there are no costs associated in obtaining the software. In partnership with the University's Information Technology Directorate - ITS, DSpace was installed successfully in a container on the Sun E25K server cluster at the University, so there were no additional hardware costs.

A substantial portion of the external grant funds were used to digitise content; a retrospective project was undertaken to create digital copies of doctoral theses produced earlier at the University. With the permission of authors and the required copyright permissions more than half of this material has been made available through ResearchSpace. The open access material is harvested by search engines and other indexing and metadata harvesters, both locally in New Zealand and internationally; the remaining material is only available within the University.

By June 2008 there were approx 1800 PhD theses and another 200 assorted papers, journal articles, conference papers available in ResearchSpace.

5 Institutional Embedding and Service Sustainability

Over the period that the Library was negotiating the changes to the PhD Statute, to require completing graduates to submit a digital copy to the library as well as the print copy, the team worked in partnership with the Graduate Centre to amend all the workflows and associated processes to ensure that the online submission of theses was as seamless as possible for both students and staff.

One of the major reasons for adopting a self-deposit system is to ensure the sustainability of service. Embedding this as a core service increases the likelihood that content will continue to grow. Studies show that repositories are not populated voluntarily by authors, and relying on library or administrative staff to do the submission is not usually sustainable.

Staff resources are better targeted at content management, copyright checking and system support. At the University of Auckland submissions are deposited into the submission buffer and only Library staff may move them to public view. Metadata is checked; consents and copyright statements are added.

The library is now partnering with the Research Office at the University to investigate internal systems for publications management. In the last five years authors at the University have published approximately 7,000 papers and books.

Research Assessment activities for the 2012 Research Evaluation (PBRF in NZ) round will form part of this investigation. It is intended that the Library will engage with the different faculties and with key University committees and taskforces with the goal of ensuring that any future improvements to the institutional publications management system will closely align with developments in the ResearchSpace service.

6 Organisational Structure

Project funding contributed to the cost of staffing for the implementation. To demonstrate ongoing commitment to the service the Library has allocated 3 FTE staff members:

1. Repository Manager – Librarian;
2. Business Analyst – Technical IT specialist;
3. Repository Administrator – Librarian in Training.

ResearchSpace is an ongoing “business as usual” system and one part of the Digital Libraries suite at the University Library.

6.1 Staffing



Figure 2 : Staffing

6.2 Reporting Lines

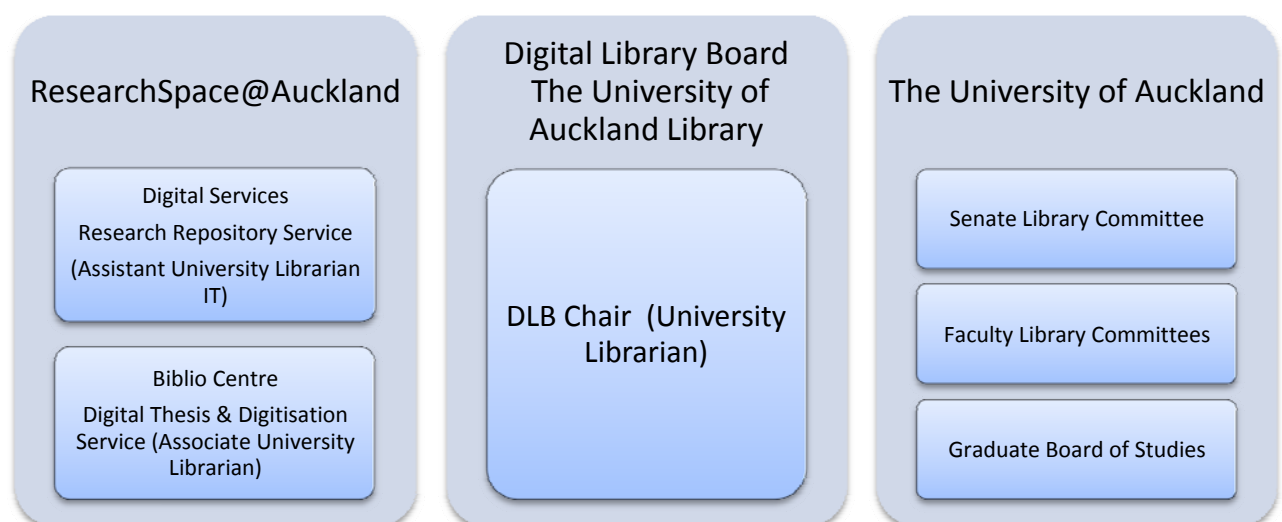


Figure 3 : Reporting Lines

7 Copyright and legal aspects

The Policy formulation and legal aspects of offering ResearchSpace as a service were protracted during the implementation phase. The copyright services section of the University assisted in formulating the wording for the forms and checking the legality of the service.

The three aspects that were addressed in this area were to protect the University, the authors and the system.

The University	The Authors	The System (ResearchSpace)
<ul style="list-style-type: none">• By distributing, hosting and managing the digital theses, the University Library was responsible for ensuring that the material in the theses complied with legislation.• Forms, cover sheets, copyright statements and licences were developed.	<ul style="list-style-type: none">• By seeking consents, licences, access and reuse instructions, clear instructions from the authors about use and reuse are kept.• When the thesis is registered in ResearchSpace it gives the author some measure of protection by timestamping the documents.	<ul style="list-style-type: none">• By registering an online licence during the submission process authors make it clear in machine readable code their conditions for use.• The licence allows for migration of document file formats if technology changes make them redundant in the future

Figure 4 : Copyright aspects

The consents and licensing for Digital Theses are quite different to managing print copies of theses. The University of Auckland took a cautious approach and was careful to ensure that there were no materials in theses that did not comply with copyright legislation. When a thesis contains any material that falls in a grey area, it is not made publicly available.

The copyright of the thesis belongs to the author and a non-exclusive licence is granted for ResearchSpace to distribute the digital copy of the thesis. The default option of public access with no restriction is the most common option for more than 90% of works which have author consent. Options are:

1. **No restriction.** Thesis is viewable and freely available for download over the Internet. An example is at <http://hdl.handle.net/2292/375>
2. **Medium restriction.** Abstract and front matter (up to Chapter 1) is viewable and freely available for download, but the rest of the thesis is restricted to ResearchSpace administrator-only access. An example is at <http://hdl.handle.net/2292/382> (Optional - access by individual request under medium restriction example <http://hdl.handle.net/2292/2008>)

3. **High restriction.** This option gives the library permission to digitise the thesis for preservation purposes. There is no access to the online thesis except by ResearchSpace administrators. An example is at <http://hdl.handle.net/2292/2090>

The cause of most confusion for authors was the 3rd party copyright restriction; this statement was added to the FAQ's to clarify what 3rd party copyright means for material in a thesis.

What is 3rd party copyright material?

Third Party Copyright (copyright material other than your own)

Students may include in a thesis quotations or short extracts taken from a copyrighted work under the fair dealing provisions of the New Zealand Copyright Act 1994 provided that such fair dealing is accompanied by a sufficient acknowledgement (i.e. properly attributed). However, you will have to get written permission from the copyright owner for any diagram, chart, graphic or image that has been directly copied as a whole from another publication. Note that a diagram or image is considered as a "whole work" in its own right and is not just a part of the publication from which it has been taken.

8 System Architecture

ResearchSpace operates in a "highly available" mode; if for any reason the production server is unavailable there is a seamless switch to the mirrored server. There is also a development environment for testing software releases, patches and customisations.

The initial system design was based on restoring the application, data store and database from a simple backup solution in the event of a disaster. The time and system outage of this option seemed unacceptable, given that users are expected to self-submit. Furthermore, the system should be able to answer the following two questions effectively from a Disaster Recovery perspective:

- Recovery Time Objective - How to provide the fastest recovery time from a disaster occurrence?
- Recovery Point Objective - How to provide the most up-to-date data in the system?

A synergy of the Universities data centre moving locations, and prompting from the Information Technology Services (ITS) Directorate led to an evaluation of other options. With support, technical expertise and good-will between the Library and ITS a modern design for the system was conceptualised.

Implementing this system architecture presented a number of unique challenges that had not been documented by the international community. Persistence, perseverance and help from technical experts overseas provided the solutions.

In the following diagram, using a combination of hardware, with networking software enabled the application to have two internal systems but appear to the world as a single virtual location.

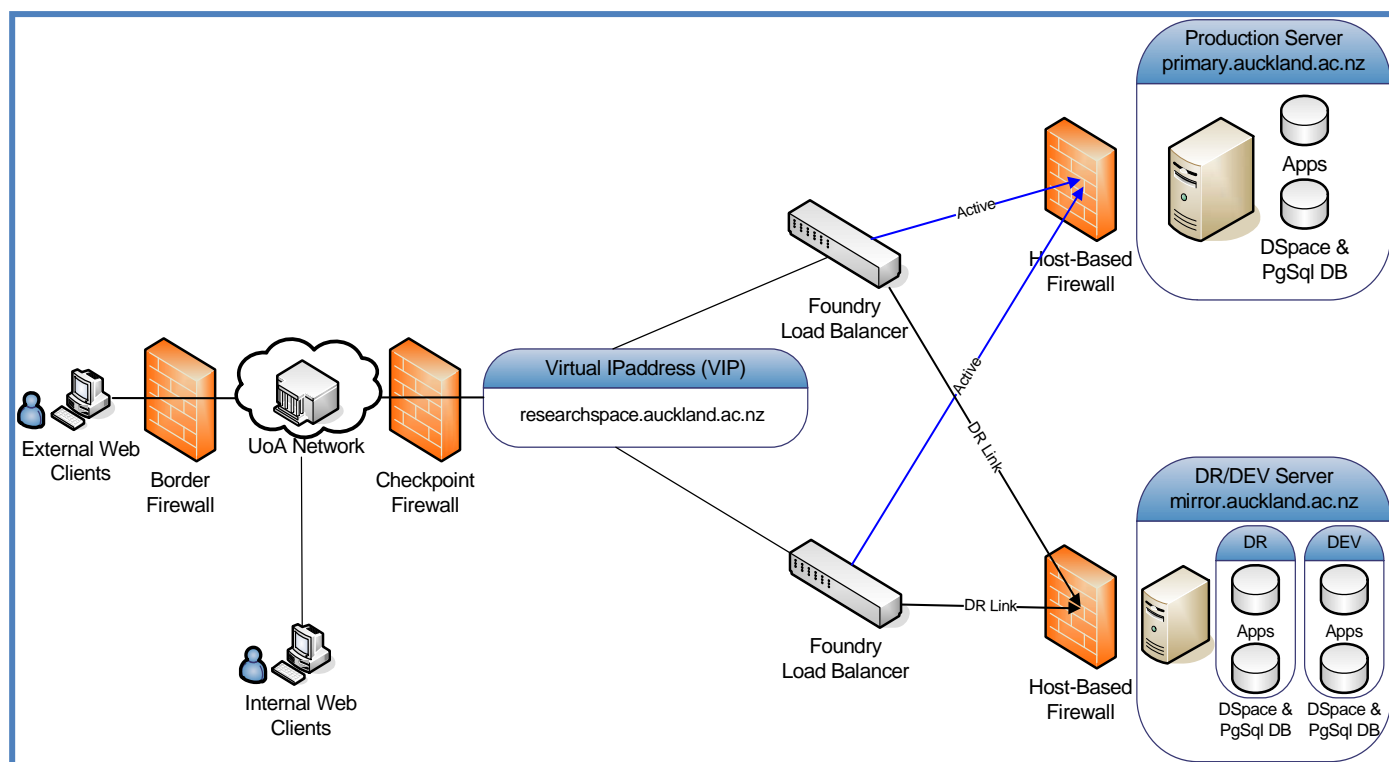


Figure 5: System Architecture

9 Metadata Schema, OAI Harvesting and Google

Qualified Dublin Core metadata fields are used to describe the items in ResearchSpace. The addition of specific metadata for theses complies with ETD-MS: an interoperability metadata standard for digital theses.

Details of this standard are available from <http://www.thesis.org/standards/metadata/current.html>

Localised metadata elements for published papers have also been added to assist in linking items using an Open URL syntax.

ResearchSpace outputs metadata for harvesting using the OAI-PMH standard <http://www.openarchives.org/pmh/> this allows for the exposure of metadata for harvesting by aggregators in a standard format.

ResearchSpace has adopted the guidelines recommended by the Kiwi Research Information Service (KRIS) <http://nzresearch.org.nz/>. Nearly 2000 records have been provided for KRIS, the content remains in ResearchSpace and users link back to the full text for access.

The OAI harvest is available from <http://researchspace.auckland.ac.nz/dspace-oai/request>

ResearchSpace also exposes content to Google using a standard sitemap and content is usually available within 2 days of being approved for public access.

10 PhD Thesis - Workflow



Figure 6 - PhD Submission Process

11 Creative Commons Implementation in ResearchSpace

11.1 Overview of the NZ Licences

New Zealand is the 41st country to launch its Creative Commons licences. Six licences (3 non-commercial and 3 commercial) have been designed by legal experts in intellectual property law for use in the New Zealand jurisdiction.

Fundamentally, Creative Commons is an international legal framework for licensing and enabling reuse of “works”, particularly works created digitally, by the creator or copyright holder.

Internationally: www.creativecommons.org

- (a) Creative Commons licences are mostly used by bloggers, musicians, governments and educators;
- (b) Most people only licence their material for non-commercial use (although people are gradually becoming more liberal with their use of the licences);
- (c) The most popularly used licence is Attribution Non Commercial Share Alike (By-NC-SA).

11.2 What are the Advantages or Opportunities?

CCANZ Licences:

- are free;
- enable digital content to be shared and conditions of its reuse to be clearly stated in simple legal language;
- provide a legal framework for attribution of economic rights related to digital content;
- are informed by and support existing New Zealand copyright legislation;
- clarify the jurisdiction where misuse will be legally challenged;
- do apply to digital derivatives of works out of copyright;
- could apply to metadata;
- allow for flexible and multiple options rather than a one size fits all approach.

11.3 What are the Issues

- Copyright ownership must be clear before assigning CCANZ licence (note: attribution is an economic right and subsumes authorship’s moral rights);
- Consideration of which CCANZ licence is appropriate for different types of work (i.e. learning materials, research outputs, image collections, datasets, music, sound and video recordings);
- Clarifying licensing of work in mandatory submission processes (ensuring contributors are informed about how their work will be displayed on an aggregated site and any reuse of it from there);
- Making a decision on which licence to use if the creator is responsible for assigning the licence (relies on the level of awareness and understanding of the individual);

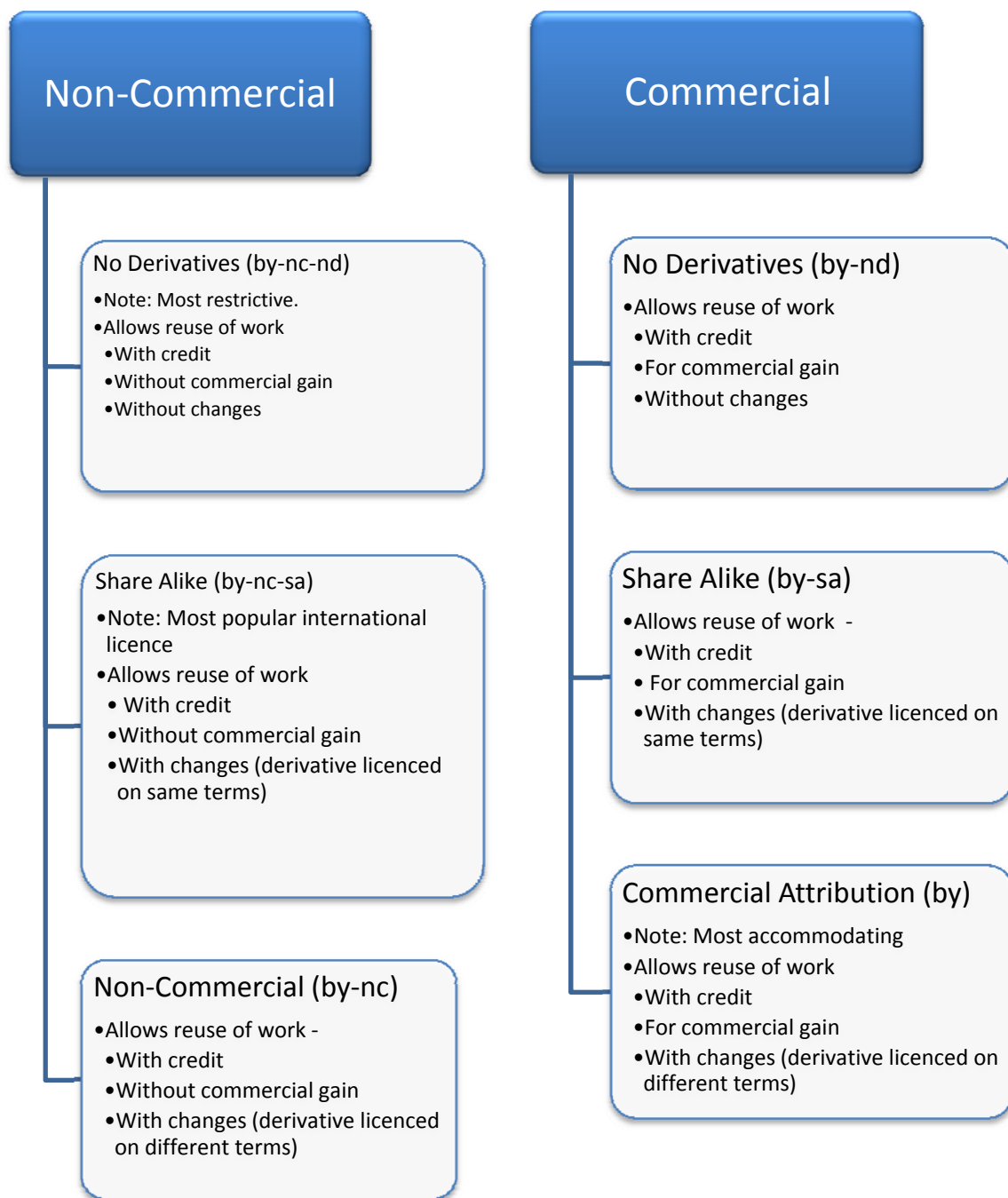


Figure 7 outlines the elements of the six licences and the potential application that an author can apply (Content compiled by John Garraway – Digital Services Manager – University of Auckland)

For more information see http://www.creativecommons.org.nz/cc/licences_explained

11.4 Overview of the Implementation in ResearchSpace

The Digital Library Board at The University of Auckland Library approved a trial of Creative Commons licences in the PhD author submission process for new submissions in 2008. When new graduates submit online they have a choice of adding a CC licence along with their consent for a digital copy.

The submission process has the Creative Commons component embedded in the software. The instructions on CC usage are in the PhD author submission guides.

A screen shot of a PhD thesis with the CC-NZ licence applied is below:

[ResearchSpace at The University of Auckland](#) >
[University of Auckland PhD Theses](#) >
[PhD Theses](#) >

Please use this identifier to cite or link to this item: <http://hdl.handle.net/2292/2490> [Edit...](#)

Title: Characterization of calpain 3 transcripts in mammalian cells : expression of alternatively-spliced variants in non-muscle cell types

Authors: [Dickson, James Michael Jeremy](#)

Keywords: Mammalian, Calpain 3, Alternative-splicing

Issue Date: 2008

Abstract: An investigation of the expression profile of mRNA encoding Calpain 3, the causative agent in the inherited human muscular disease Limb Girdle Muscular Dystrophy Type 2A, was conducted in two representative mammalian species, human and mouse. Transcripts encoding Calpain 3 were identified from mammalian tissues other than skeletal muscle. In human Peripheral Blood Mononuclear Cells (PBMCs) these transcripts were identified in both the T-cell and B-cell compartments and in a number of human blood cell lines representing different haematopoietic lineages. Calpain 3 transcripts encoding the murine homologue were also described from mouse PBMCs and from murine tissues involved in haematopoiesis. In addition to the confirmation of Calpain 3 expression in non-skeletal muscle tissues in both these species, transcripts were identified with precise and defined deletions, which mapped to known exon-exon boundaries in the Calpain 3 gene from both species. These deletions constituted the removal by alternative splicing of skeletal muscle-specific components of the Calpain 3 protein known to regulate its function in this tissue. Monoclonal antibodies to the Calpain 3 protein were used to confirm the presence of Calpain 3 protein in non-skeletal muscle tissues of both human and mouse. In humans the expression of Calpain 3 protein was confirmed in PBMCs and in the mouse, Calpain 3 expression was confirmed in tissues of the haematopoietic compartment. In both species the Calpain 3 protein expressed correlated with translation from a transcript lacking the skeletal muscle-specific components generated by alternative splicing. An attempt was made using a Yeast Two Hybrid assay to identify potential regulatory molecules of Calpain 3 in human PBMCs, but without a definitive candidate molecule being found. A developmental model of muscle differentiation (murine C2C12 myoblast cells) was used to ascertain the expression profile of Calpain 3 in the early stages of myofibrillogenesis. Using Quantitative Real Time PCR the expression profile of Calpain 3 was assessed in differentiating C2C12 cells. These results showed that the absolute levels of Calpain 3 transcription were elevated during differentiation and that a temporal Calpain 3 isoform shift occurred during this process. This temporal shift in expression was from transcripts having identical deletions to those seen in the haematopoietic tissues, to full length transcripts representative of skeletal muscle-specific Calpain 3. The identification of Calpain 3 expression outside skeletal muscle tissue is novel and the isoforms expressed in these tissues are structurally more analogous to the ubiquitously expressed calpains. This has implications for LGMD2A where a loss of function of Calpain 3 in non-skeletal muscle tissue could be compensated for by the ubiquitous calpains, thus explaining the lack of any non-muscle tissue pathology in LGMD2A patients.

URI: <http://hdl.handle.net/2292/2490>

Appears in Collections: [PhD Theses](#)

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01front.pdf	Front Pages	197.74 kB	Adobe PDF	View/Open

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Behind the scenes view of administrative metadata in the record

Bitstreams

Note: Changes to the bitstreams will not be automatically reflected in the Dublin Core metadata above (e.g. `format.extent`, `format.mimetype`). You will need to update this by hand.

Also note that if the "user format description" field isn't empty, the format will always be set to "Unknown", so clear the user format description before changing the format field.

Primary Bitstream	Name	Source	Description	Format	User Format Description	
	01front.pdf.txt	Written by FormatFilter c	Extracted text	5 (Text)		View Remove
	02whole.pdf.txt	Written by FormatFilter c	Extracted text	5 (Text)		View Remove
<input type="radio"/>	02whole.pdf	/u01/dspace/upload/02	Whole Document	3 (Adobe PDF)		View Remove
<input type="radio"/>	01front.pdf	/u01/dspace/upload/01f	Front Pages	3 (Adobe PDF)		View Remove
	license.txt	Written by org.dspace.c		2 (License)		View Remove
	license_rdf	org.dspace.license.Cre		2 (License)		View Remove
	license_text	org.dspace.license.Cre		2 (License)		View Remove
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Technical aspects of applying NZ version of Creative Commons licence

The DSpace software is open source; the application is able to be configured using the source code developed by the international community. Unfortunately the default within DSpace is the International USA version of Creative Commons and to apply the NZ jurisdiction licence, a localised version of CC NZ needs to be applied.

In the DSpace application, the Creative Commons code attaches three files to the metadata record which contains the licence information about the work. The *rdf* file attached to the record, expresses the licence information in machine readable RDF description.

A detailed set of instructions for modifying the Java source code for local licences is on the DSpace Wiki.

<http://wiki.dspace.org/index.php/LocaliseCreativeCommons>

12 Lessons Learned

1. Technical issues/problems have been the easiest part of the implementation to solve.
2. The time required to implement the legal aspects and statute changes was lengthy and needed to be factored into planning timeframes – but critical to successful institutional embedding.
3. Institutional embedding is the key for ongoing submissions.
4. Adequate funding has been the enabler, but institutional support has guaranteed the sustainability of the service.
5. Partnerships and collaborations have added significant value.

13 Ongoing Work for 2008

1. Migrate the interface to one using XML based Manakin Software for Semester Two 2008.
2. Authenticated Login using enterprise level SSO University signon.
3. Deposit licences and copyright clearance for approx 500 published papers completed by authors at the University.
4. Engagement with Research Office for interoperability between an enterprise publications system and ResearchSpace.
5. Leverage the content in ResearchSpace through a new resource discovery layer being adopted by the University Library.

14 More publications about ResearchSpace

2008 “Research Repository Case Study: The University of Auckland Library, New Zealand” Third International Conference on Open Repositories, April 1st – 4th, 2008 University of Southampton UK. Repository Managers Case Study. <http://hdl.handle.net/2292/2557>

2008 “Giving research global reach: ResearchSpace@Auckland” Poster presented at 29th IATUL Conference 2008 <http://hdl.handle.net/2292/2504>

2008 “ResearchSpace@Auckland: Disaster Recovery (DR)” Poster presented at Open Repositories 2008 Conference, Southampton UK. <http://pubs.or08.ecs.soton.ac.uk/67/> <http://hdl.handle.net/2292/2503>

2007 “Getting Research ‘Out There’: ResearchSpace@Auckland” Poster presented at LIANZA Conference 2007 <http://hdl.handle.net/2292/1868>

2007 “Institutional Collaboration around Institutional Repositories” poster presented at [EDUCAUSE Australasia 2007](#) <http://hdl.handle.net/2292/411>