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Federated Search in an Age of Web Services

Glen Newton CISTI Research

National Research Council Canada

Michael Fortin, Concordia University

Access 2005

October 17-19 2005

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Outline

- Original Problem
- Initial solution
- Expermentation
- Implications
- Conclusion

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Two Important Points

- This is a talk on federated search

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Two Important Points

- This is a talk on federated search
- This is NOT a talk on federated search

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Original Problem Part 1

- Canadian government has standard look & feel for web pages, known as “Common Look and Feel” (**CLF**)
- Includes accessibility, design, navigations, official languages, metadata, etc.
- All web sites must comply (limited exceptions)
- Sometimes difficult to make compliant

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Original Problem Part 1

- CISTI has web interface to Catalogue (Innovative)
- Not CLF compliant

Special Notice

On the Monday of the Canadian Thanksgiving long weekend, October 10, 2005, CISTI's Direct Supply service orders will be filled as usual. Client services and Urgent services will not be available. Thank you for your understanding.

Search and Order
Search and Order from the Catalogue
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About CISTI

Search and Order from the Catalogue

The Catalogue allows you to search the CISTI collection and that of its partner, the Canadian Agriculture Library (CAL). To order an item, access the full record display of that item and click on "Order this Item." New users must register before ordering.

Search the Catalogue

Catalogue Help | How To Find Articles

Search type: Title begins with

Search terms:

Catalogue subset: Entire Catalogue (CISTI and CAL)

Search

Result Page: 1 2 3 4 5 6 7 8 9 10 11 ... 236 Next Page

Save Marked Records | Save All on Page

Num	Mark	TITLES (1-12 of 2821)	Year	Entries 3159 Found
1	☐	Cell		12
2	☐	Cell A Molecular Approach		3
3	☐	Cell A Vertically Integrated Learning Resource	1996	1
4	☐	Cell Abstract Indices For Content Based Approximate Query Processing In Structured Peer To Peer Data Systems	c2004	1
5	☐	Cell Activation And Apoptosis In Hiv Infection Implications For Pathogenesis And Therapy	c1995	1
6	☐	Cell Activation And Signal Initiation Receptor And Phospholipase Control Of Inositol Phosphate Paf And Eicosanoid Production	1989	1
7	☐	Cell Activation And Signal Initiation Receptor And Phospholipase Control Of Inositol Phosphate Paf Eicosanoid Production	1988	1
8	☐	Cell Activation By C	c1999	1
9	☐	Cell Activation Genetic Approaches	c1991	1
10	☐	Cell Activation Indo 1 Ratiometric Analysis Of Intracellular Ionized Calcium	c1992	1
11	☐	Cell Activation Via Fc Receptors	c1997	1
12	☐	Cell Activity After Cell Growth Inhibition By The Irf 1 System	c1999	1

Save Marked Records | Save All on Page | Jump to Number 2821

Result Page: 1 2 3 4 5 6 7 8 9 10 11 ... 236 Next Page

Extended Results | Return to Results | Limit Search | Another Search | (Search History)

TITLE | cell | Entire Catalogue (CISTI and CAL) | Search

Save Marked Records | Save All on Page

Num	Mark	TITLES (1-3 of 3)	Year
Cell A Molecular Approach			
1	☐	The Cell : A Molecular Approach Geoffrey M. Cooper.	c1997
2	☐	The Cell : A Molecular Approach Geoffrey M. Cooper.	c2000
3	☐	The Cell A Molecular Approach [Electronic Resource] : Geoffrey M. Cooper.	c2000

Save Marked Records | Save All on Page

Extended Results | Return to Results | Limit Search | Another Search | (Search History)

CISTI Catalogue Search Pages

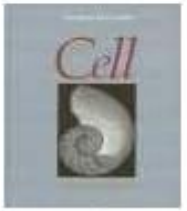
- Advanced Keyword
- Author
- Report Number
- Title
- Subject
- Control Number
- Series Title
- ISSN/ISBN/CODEN
- Call Number

Other Collections

- CISTI Partners
- SmartLibrary (Search 5 Ottawa area catalogues simultaneously)

Record 2 of 3

Previous record | Next record



Name Cooper, Geoffrey M.
Title **The cell : a molecular approach / Geoffrey M. Cooper.**
Publisher Washington, D.C. : ASM Press ; Sunderland, Mass. : Sinauer Associates, c2000.
Edition 2nd ed.

LOCATION	CALL #	STATUS
BRI	QH581.2 C777 2000	NRC USE ONLY

1 copy being processed for BRI.

TABLE OF CONTENTS

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Original Problem Part 2

- NRC has adopted a commercial content management system (CMS) for managing web sites (Interwoven *TeamSite*)
- Proprietary, but relatively open, using XML & other standards
- Web sites & applications to migrate to CMS
- CLF templates
- While the CMS understands HTML, XML, JSP, ASP, PHP, servlets, etc. did not understand the catalogue web interface
- **How to migrate the Web view of the catalogue to CLF and into the CMS**

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Initial Solution

- “Bridging” Web application which the CMS would understand, and which could talk to catalogue
- PHP 5
- Used Z39.50 to query catalogue
- Could be embedded into CMS
- Due to Z39.50 performance & connection dropping issues, used YAZ Z39.50 accelerating & caching Z39.50 proxy
- Implemented using Linux, Apache, PHP 5

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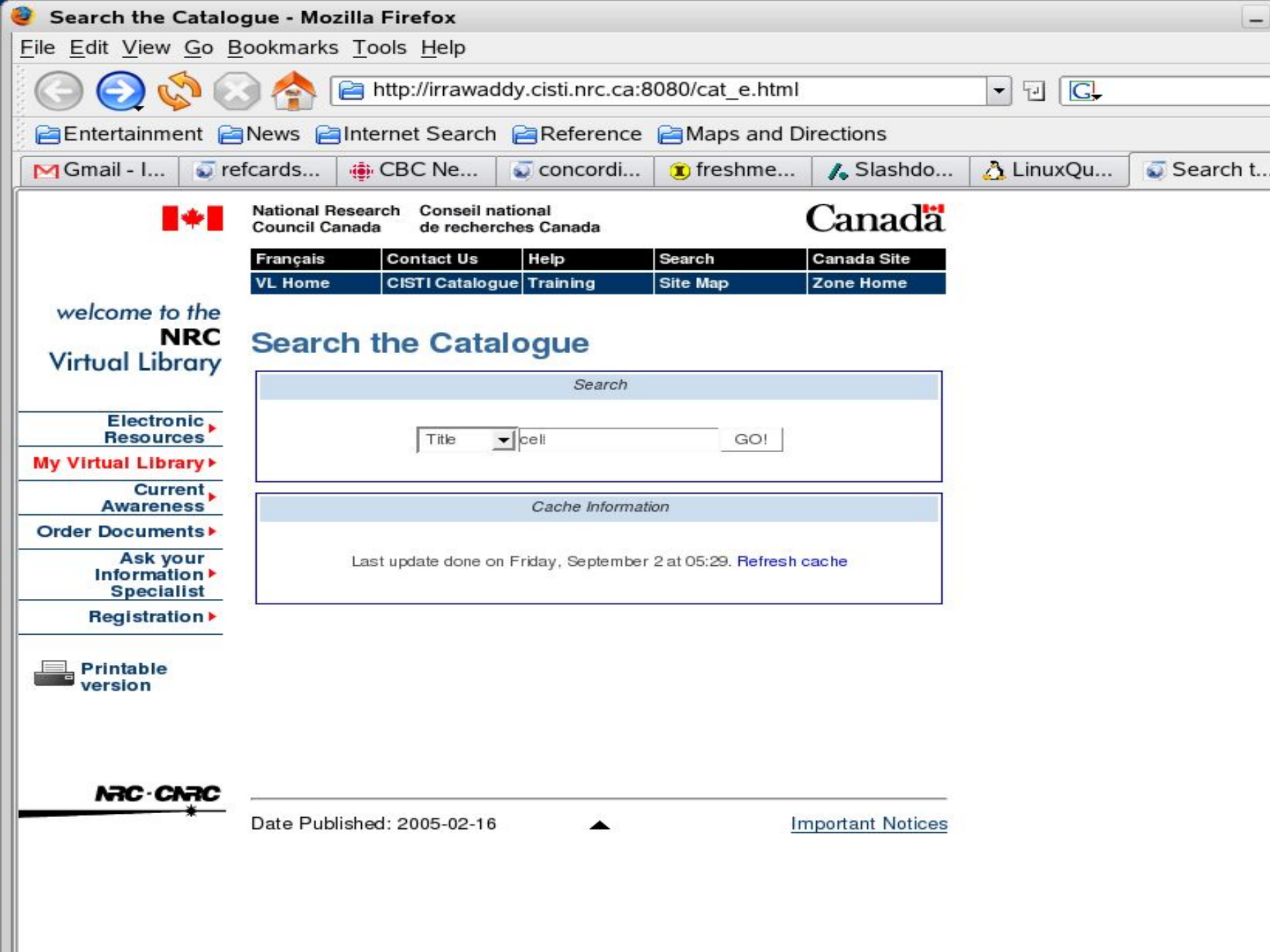
Initial Solution (Problems)

- Z39.50 problems: server could not handle sustained, but not high level, of queries
- Connections would be dropped, new connection attempts would time-out
- Due to Z39.50 performance & connection dropping issues, used YAZ accelerating & caching Z39.50 proxy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http://irrawaddy.cisti.nrc.ca:8080/cat_e.html
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Gmail - I... refcards... CBC Ne... concordi... freshme... Slashdo... LinuxQu... Search t...
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Cache Information
Last update done on Friday, September 2 at 05:29. Refresh cache
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Date Published: 2005-02-16
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Search the Catalogue

3120 results found on the CISTI Catalogue

Title	*Year*
Basics of heart failure :	c2000.
The **cell** /.	c1977.
The **cell** /.	c1964.
Cell and tissue ultrastructure :	c1993.
Cell.	1974-
Gekkan saibâo =	[1969]-1999.
Introduction to bioinformatics :	c2003.
Life, the science of biology /	c1992.
Molecular biology of the **cell** /.	c1989.
Molecular **cell**.	c1997-

1 2 3 4 5 6 ... 310 311 312

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View Record Details

Alternate Author Alberts, Bruce.

Title Molecular biology of the cell / Bruce Alberts ... [et al.].

Edition 2nd ed.

Publisher New York : Garland Pub., c1969.

ISBN 0824036956
0824036964 (pbk.)

Call Number
QH581.2 M718 1989

Description xxxix, 1219, 44 p. : ill. (some col.) ; 29 cm.

Subject Cytology. Molecular biology.

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Initial Solution Completed

- Successfully showed that a view of the Catalogue could be moved to both the CMS and to CLF
- Altered (“cleaned up?”) web GUI
- Limitations:
  - Could not limit to specific collections (only electronic, etc)
  - Could not build patron web GUI using Z39.50

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What next?

- Having the application built using PHP, this allowed for easy extensions
- AJAX (Asynchronous Javascript and XML) ?
- Other Z39.50 databases ?
- Other non-Z39.50 databases ?

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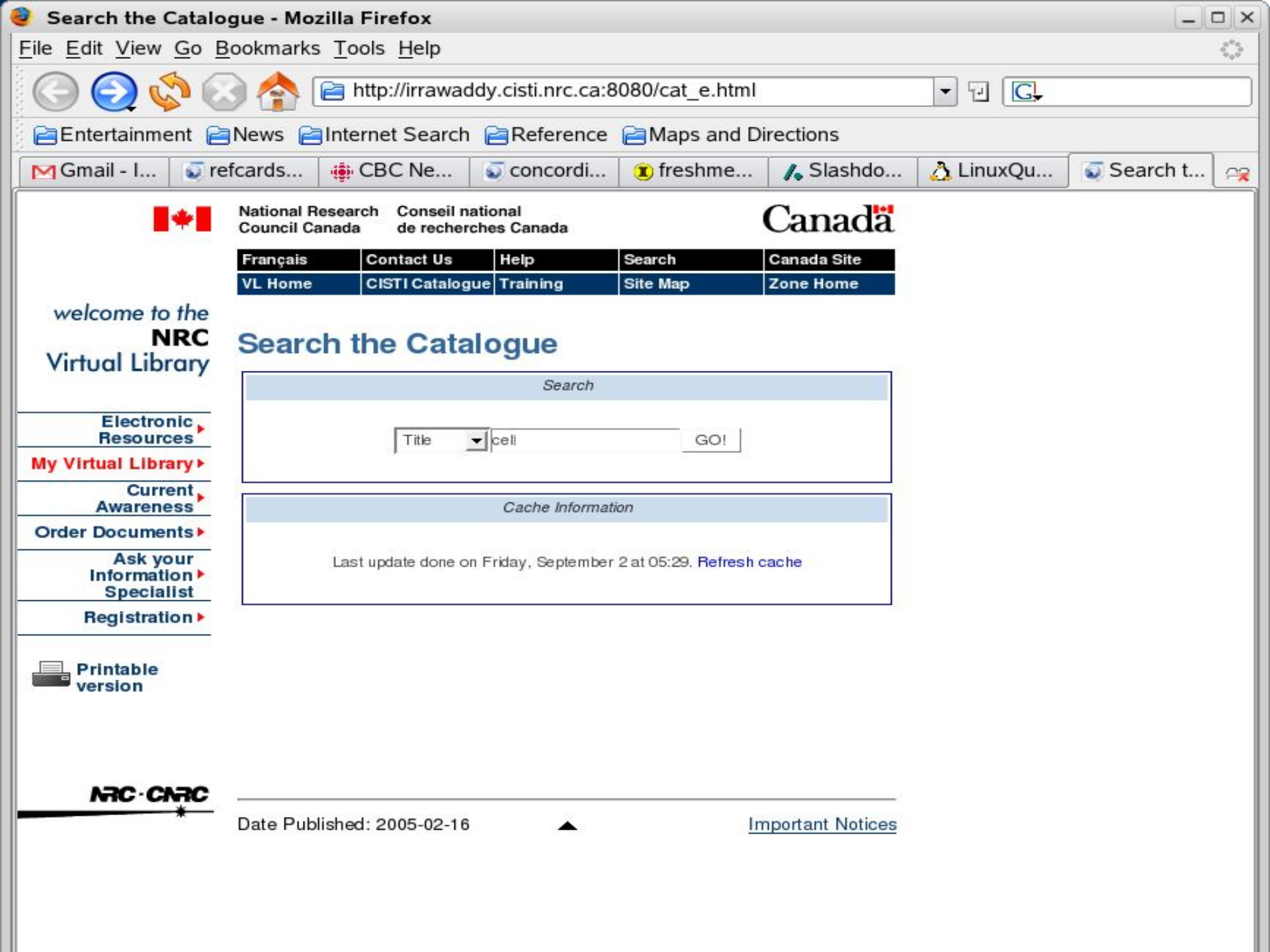
Experimentation

- Having the application built using PHP, allowed for easy extensions
- First extension was to move to AJAX (Asynchronous Javascript and XML)
- Search of other Z39.50 databases
- Search of PubMed using HTTP REST
- Search of Amazon using Web Services
- Use Web Services to get cover art from Amazon
- Search of our own metadata database (MySQL)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Cell.	1974-
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Introduction to bioinformatics :	c2003.
Life, the science of biology /	c1992.
Molecular biology of the **cell** /.	c1989.
Molecular **cell**.	c1997-

1 2 3 4 5 6 ... 310 311 312

14228 results found on CISTI Signal [View Results]

3156 results found on Amazon [View Results]

422906 results found on PubMed [View Results]

142 results found on National Library of Canada [View Results]

No results found on National Archives

2 results found on National Film Board [View Results]

Do Another Search

View Record Details

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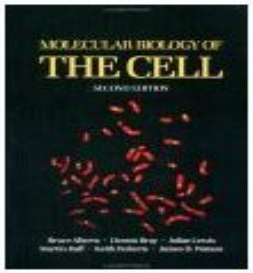

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0824036964 (pbk.)

Call Number
QH581.2 M718 1989

Description xxxix, 1219, 44 p. : ill. (some col.) ; 29 cm.

Subject Cytology. Molecular biology.

Further Information from Amazon; Click hyperlink on title to see item at Amazon

ISBN	*Title*	*Publisher*	*Publication Date*	*# of Pages*	*List Price*
0824036956	Molecular Biology Of The Cell	Garland Publishing, Inc.	1989	1308	CDN$ 89.50
0824036964	Molecular Biology of the Cell	Taylor & Francis	1989-06		CDN$ 63.54

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Search the Catalogue

3120 results found on the CISTI Catalogue [View Results]

14228 results found on CISTI Signal [View Results]

3156 results found on Amazon

Title	*Year*
Molecular Biology of the **Cell** (Book) with CDROM	2002
Cell Talk	2003-04-08
Molecular Biology of the **Cell**: A Problems Approach	2002
Cell Phones: Invisible Hazards in the Wireless Age: An Insider's Alarming Discoveries about Cancer and Genetic Damage	2000-11-27
The Dictionary of **Cell** & Molecular Biology	1999
Tom Clancy's Splinter **Cell**	2004-12-06
Tom Clancy's Splinter **Cell**: Chaos Theory: Prima Official Game Guide	2005-04-05
Protocols for Neural **Cell** Culture: Third Edition	2001
Red **Cell**	1994-12-01
The Jerk with the **Cell** Phone: A Survival Guide for the Rest of Us	2004-09-10

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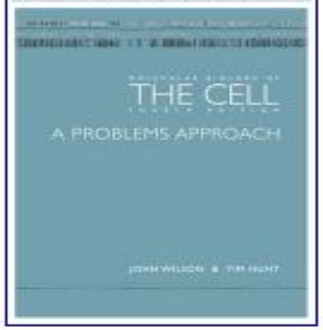
Author John Wilson; Tim Hunt
Title Molecular Biology of the Cell: A Problems Approach
Publisher Garland Publishing, Inc.
Date Published 2002

Image from Amazon



ASIN 0815335776
Number of Pages 550

Further Information from Amazon; Click hyperlink on title to see item at Amazon

ISBN	*Title*	*Publisher*	*Publication Date*	*# of Pages*	*List Price*
0815335776	Molecular Biology of the Cell: A Problems Approach	Garland Publishing, Inc.	2002	550	CDN$ 51.95

Return to: results > Molecular Biology of the Cell: A Problems Approach

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Title cell GO!

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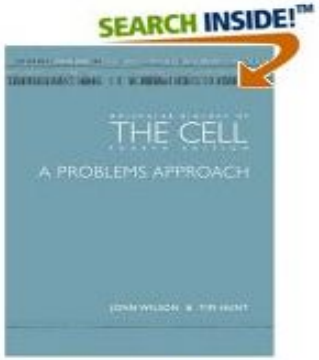
by John Wilson (Author), Tim Hunt (Author)



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3156 results found on Amazon [View Results]

422906 results found on PubMed

Title	*Journal*	*Year*
Directed **cell** migration via chemoattractants released from degradable microspheres.	Biomaterials	Aug/2005
Quality control assessment of ePTFE precoating procedure for in vitro endothelial **cell** seeding.	Biomaterials	Aug/2005
Calcification as an indicator of osteoinductive capacity of biomaterials in osteoblastic **cell** cultures.	Biomaterials	Aug/2005
Influence of carboxyl group density on neuron **cell** attachment and differentiation behavior: Gradient-guided neurite outgrowth.	Biomaterials	Aug/2005
Biomaterial microarrays: rapid, microscale screening of polymer-**cell** interaction.	Biomaterials	Aug/2005
Influence of stirring-induced mixing on **cell** proliferation and extra**cell**ular matrix deposition in meniscal cartilage constructs based on polyethylene terephthalate scaffolds.	Biomaterials	Aug/2005
Development of mammalian **cell**-enclosing subsieve-size agarose capsules (<100mum) for **cell** therapy.	Biomaterials	Aug/2005

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Current Awareness
Order Documents
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142 results found on National Library of Canada

Title	Author	Subject	Year
Cell-free studies on the synthesis and regulation of alpha-fetoprotein / by David Wayne O'Keefe.	O'Keefe, David Wayne.		1975.
Cell-mediated immunity in breast carcinoma patients / by Julie P. Deans.	Deans, Julie P.		1975.
Cell division and macromolecular synthesis in Tetrahymena pyriformis : the action tetrahydrocannabinol, morphine, levorphanol and levallorphan / by Daniel K. McClean.	McClean, Daniel K., 1944-		1972.
The **cell** envelope of Rhizobium meliloti in relation to nitrogen-fixing effectiveness / by Colin Roger MacKenzie.	MacKenzie, Colin Roger.		1973.
The **cell**/ Horst Beenek. Introd. by Daniel Berrigan. Translated from the	Bienek, Horst, 1930-		c1972, 1973

No results found on National Archives

2 results found on National Film Board [View Results]

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Creating good user interfaces for search results

1) One source containing one kind of metadata: **very easy**
2) 5-8 sources containing one or a small number of kinds of metadata: **fairly easy** (we did this)
3) Many sources containing many different kinds of metadata: **heavy lifting involved**

AJAX

- Asynchronous Javascript And XML
- Important step in Web-based applications becoming more desktop GUI-like, with finer level of interaction granularity (no more “full-in-form-and-submit” entire page update cycle)
- Google maps best known AJAX-driven application
- While initially rather complicated to implement applications using AJAX, toolkits are becoming mature for most programming languages making implementation very easy and flexible

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Amazon Web Services

- Very rich Web Services API allowing searching by various metadata (ISSN, title, author, etc)
- Ability to request cover art for books, CDs, etc. via API
- Additional Amazon information also available, like reviews, ratings, wish lists, etc.
- If you become an Amazon partner, any users who make purchases at Amazon, you get a cut from the purchase

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Amazon Web Services: *Caveats*

- Make sure you read the Amazon Web Services Licensing Agreement
- Peace Palace Library, The Netherlands

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Implications

- Explosion of Web Services by many disparate players beyond the initial few (Google API, Google Scholar API, Amazon, etc)
- M2M becomes basis of applications
- Services Oriented view of the universe
- Z39.50 history of library world puts it in good standing
- (Yet still more!) legal & licensing issues with which to deal
- Rich applications with better & more responsive GUI presenting users with information from a number of

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Conclusion

- Able to build prototype embedding Web view of catalogue into CMS & compliant to CLF
- Open standards helped(Z39.50 to communicate to Catalogue; XML & others with CMS; Web Services)
- Easily implemented using Open Source (PHP, Apache, Linux)
- Issues also resolved using Open Source & open standards (YAZ Z39.50 proxy)
- Implications of proliferation of Web Services and AJAX signify major change in the Web

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Thank You

Glen Newton CISTI Research

glen.newton at nrc-cnrc.gc.ca

Michael Fortin, Concordia University

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CISTI Lab: http://lab.cisti-icist.nrc-cnrc.gc.ca/

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References

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- Canadian Government Common-Look-and-Feel standards and guidelines: http://www.tbs-sct.gc.ca/clf-nsi/index_e.asp
- Innovative Interfaces: http://www.iii.com/
- Interwoven Teamsite CMS: http://www.interwoven.com/
- PHP: http://www.php.net/
- PubMed scripting page: http://eutils.ncbi.nlm.nih.gov/entrez/query/static/eutils_help.html
- YAZ Z39.50 proxy: http://www.indexdata.dk/yazproxy/

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Presentation produced using an Open Source office suite,
Open Office

http://www.openoffice.org/

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Acknowledgements

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- Greg Kresko, CISTI Research