Content Innovation

Increasing research efficiency

Lucia Franco

15 April 2010

Content Innovation – A Journey

- Article of the Future
  - Why, How, What
  - Cell Press case
  - Feedback
  - Other disciplines
- Contextual Linking

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Elsevier Article of the Future project

- Why: increase efficiency of the scientist
  - Faster understanding and digestion of article
  - Easier execution of tasks related to the article
- How: provide discipline-specific value to article
  - Different disciplines have different needs and tasks
  - Integration with / and interconnecting to other research
  - Match with workflow behaviour
- What:
  - Article format / presentation

    (semantics is a different project)
  - Exploit web-technology capabilities
  - In collaboration with scientific community

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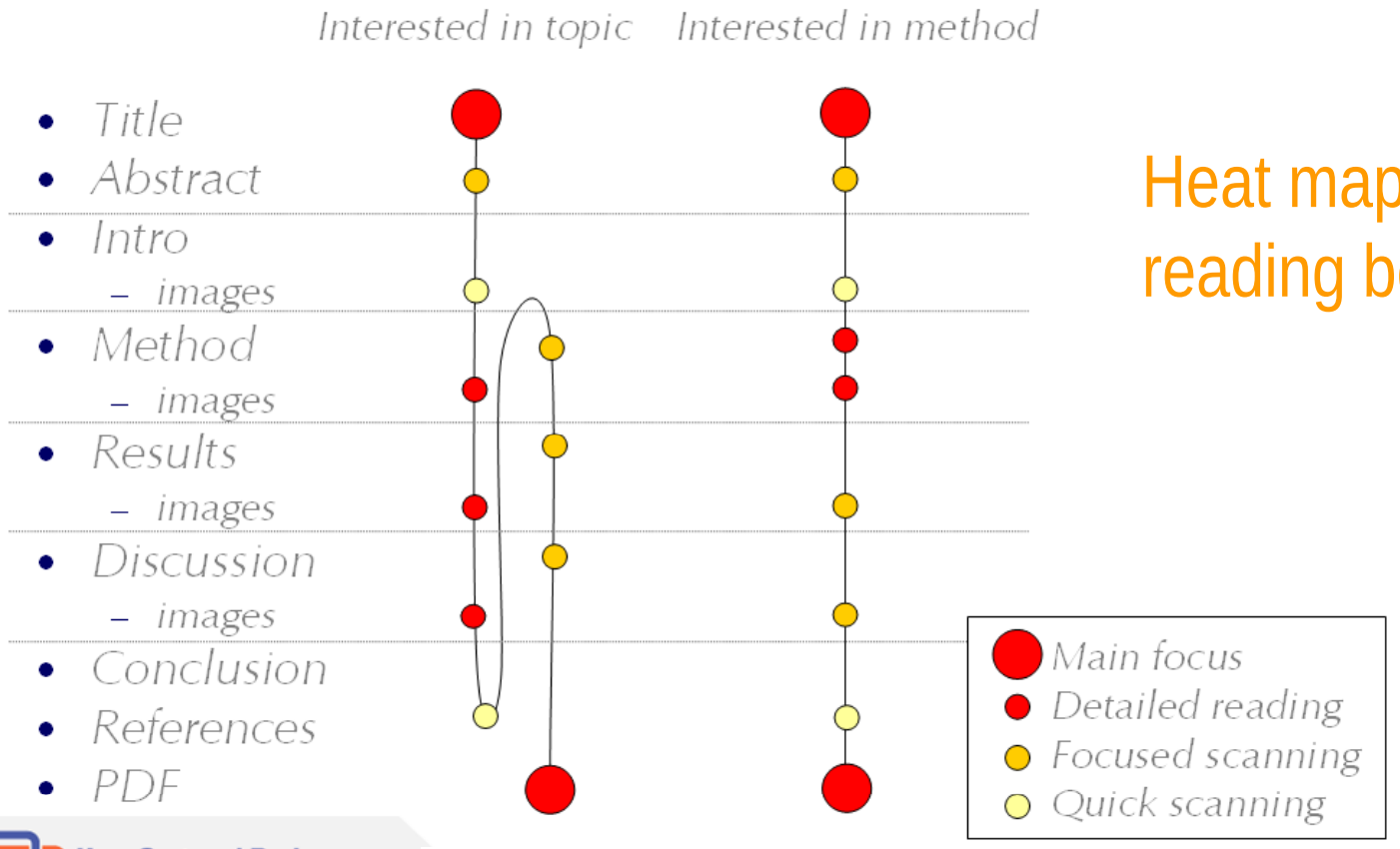
Article of the Future: Cell Press

- July 2009: Cell Press AotF prototype went public
- January 2010: Cell Press AotF production (cell.com)



Heat map of reading behavior

User Centered Design
ELSEVIER

Tabbed view for quick support of tasks

Article ◀ ▶ PaperClip Article PDF (1458 KB) Extended Article PDF (2136 KB)

Cell, Volume 140, Issue 1, 123-135, 8 January 2010 | Copyright © 2010 Elsevier Inc. All rights reserved. | 10.1016/j.cell.2009.12.030

Aire's Partners in the Molecular Control of Immunological Tolerance

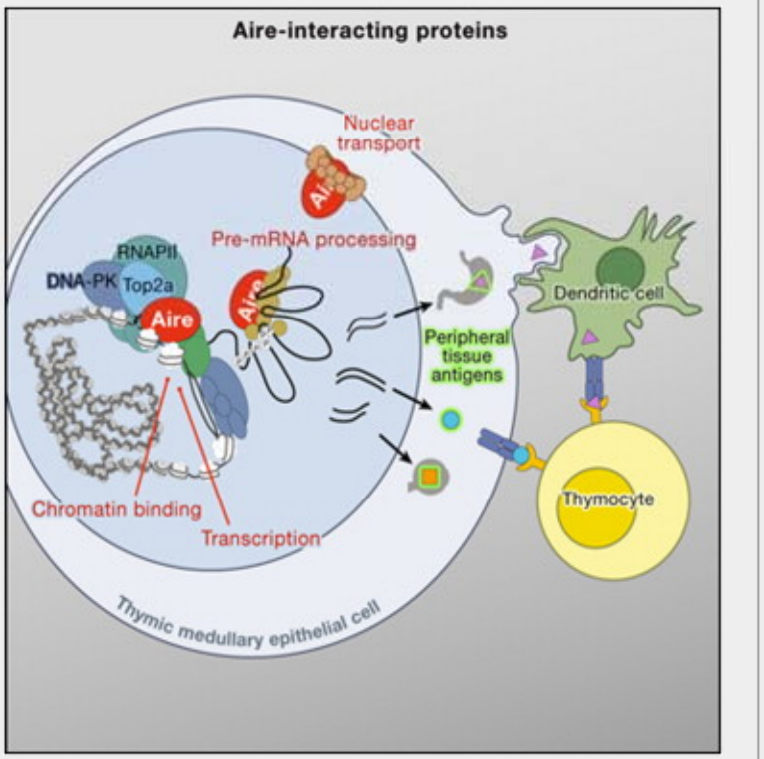
Jakub Abramson, Matthieu Giraud, Christophe Benoist, Diane Mathis

Summary | Introduction | Results | Discussion | Exp. Proc. | Data | References | Supp. Info. | Related Info. | Comments (0)

Highlights

- To promote immune tolerance, Aire induces ectopic expression of genes in the thymus
- Aire partners with numerous factors to regulate gene expression at multiple levels
- With DNA-PK and Topoisomerase 2 Aire enhances formation of DNA double-stranded breaks
- Aire also regulates gene expression at the level of pre-mRNA processing

Graphical Summary | PaperClip



Summary

Aire induces the expression of a battery of peripheral-tissue self-antigens (PTAs) in thymic stromal cells, promoting the clonal deletion of differentiating T cells that recognize them. Just how Aire targets and induces PTA transcripts remains largely undefined. Screening via Aire-targeted coimmunoprecipitation followed by mass spectrometry, and validating by multiple RNAi-mediated knockdown approaches, we identified a large set of proteins that associate with Aire. They fall into four major functional classes: nuclear transport, chromatin binding/structure, transcription and pre-mRNA processing. One set of Aire interactions centered on DNA protein kinase and a group of proteins it partners with to resolve DNA double-stranded breaks or promote transcriptional elongation. Another set of interactions was focused on the pre-mRNA splicing and maturation machinery, potentially explaining the markedly more effective processing of PTA transcripts in the presence of Aire. These findings suggest a model to explain Aire's widespread targeting and induction of weakly transcribed chromatin regions.

Research highlights with key results

Article ◀ ▶ PaperClip Article PDF (1458 KB) Extended Article PDF (2136 KB)

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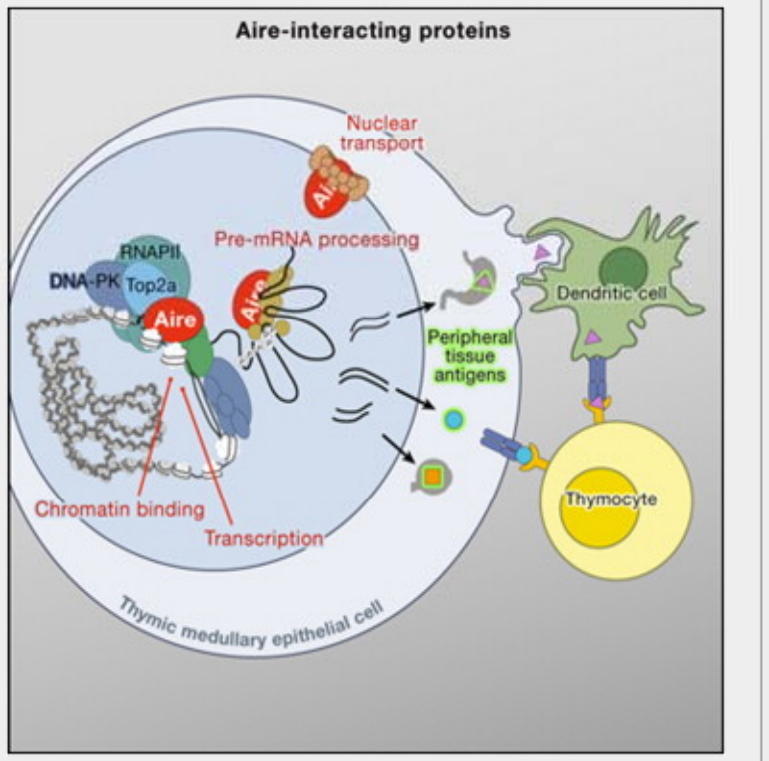
Graphical Summary | PaperClip



Graphical abstract with main message

Article ◀ ▶ PaperClip Article PDF (1458 KB) Extended Article PDF (2136 KB)

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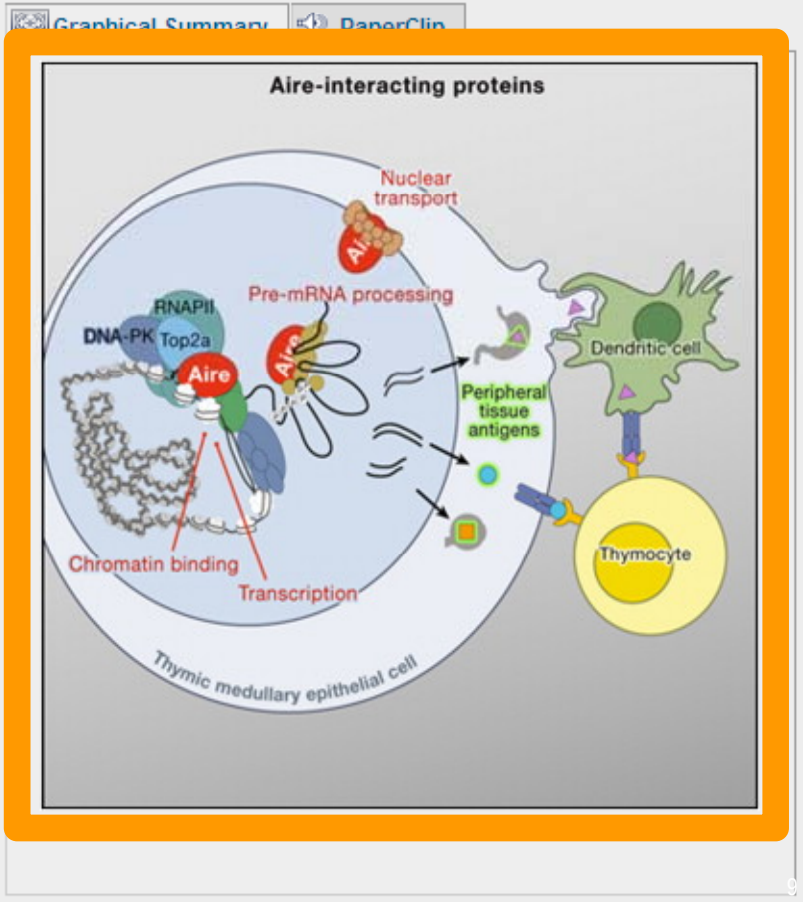


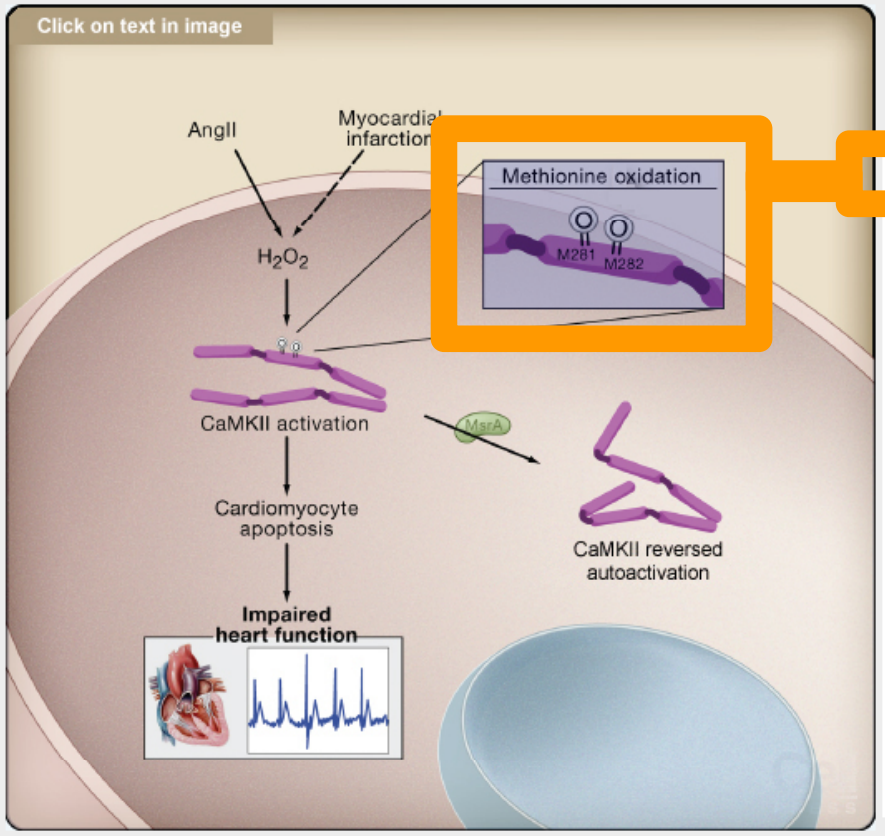
Clickable figure to navigate to sub-sections

May 2, 2008 - Volume 133, Issue 3, pp. 462-474 PDF (1,758 KB)

A Dynamic Pathway for Calcium-Independent Activation of CaMKII by Methionine Oxidation

Jeffrey R. Erickson[1], Mei-ling A. Joiner[1], Xiaoqun Guan[1], William Kutschke[1], Jinying Yang[1], Carmine V. Oddis[5], Ryan K. Bartlett[6], John S. Lowe[1], Susan E. O'Donnell[2], Nukhet Aykin-Burns[3], Matthew C. Zimmerman[3], Kathy Zimmerman[3], Amy-Joan L. Ham[7,8], Robert M. Weiss[1,9], Douglas R. Spitz[3], Madeline A. Shea[2], Roger J. Colbran[7], Peter J. Mohler[1,4], and Mark E. Anderson[1,4,*] Affiliations

Abstract | Introduction | Results | Discussion | Experimental Procedures | Figures (8+) | References (51) | Authors | Comments (3) | Acknowledgements



resize

All Results > Methionine oxidation

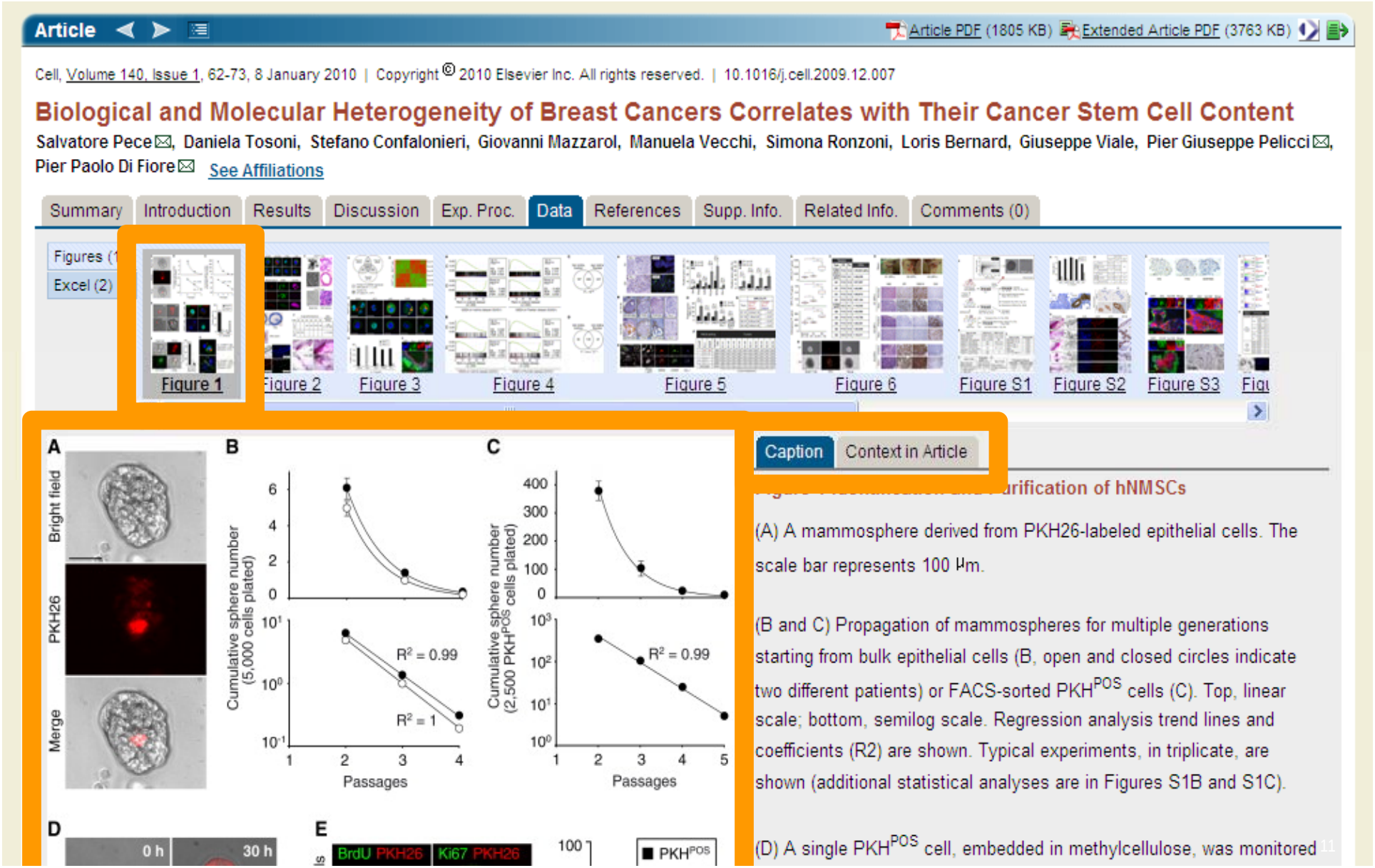
Text | Figures (8) | References (13)

Result text sections associated with Methionine oxidation:

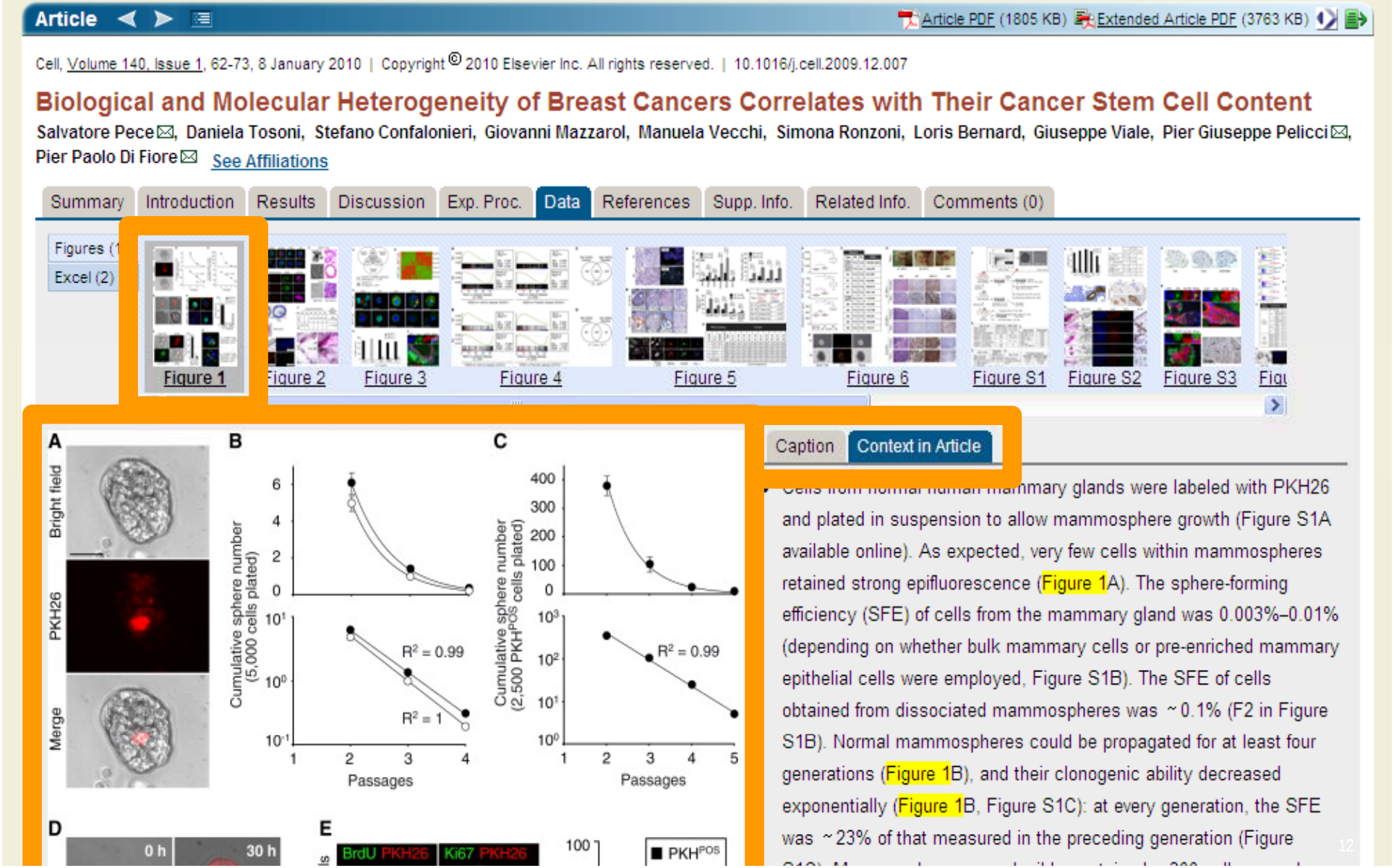
Oxidation Directly Activates CaMKII

CaMKII is activated by Ca2+/CaM, but autophosphorylation at T287 sustains catalytic activity after dissociation of Ca2+/CaM (Figure 1A) because the negatively charged phosphate prevents reassociation of the catalytic domain and autoinhibitory region (Hudmon and Schulman, 2002). CaMKII activity may also be enhanced by pro-oxidant conditions (Zhu et al., 2007); we therefore hypothesized that oxidation of the regulatory domain in the vicinity of T287 could sustain CaMKII catalytic activity by an analogous mechanism. Exposure of purified CaMKII to H2O2 in the absence of any pretreatment yielded no discernable CaMKII activity (Figure 1B). However, exposure to H2O2 after pretreatment with Ca2+/CaM yielded persistent CaMKII activation even in the presence of EGTA. These data suggest that Ca2+/CaM binding exposed a key segment of CaMKII for oxidation, and that oxidation interfered with the interaction of the autoinhibitory and catalytic domains. Activation of wild-type (WT) CaMKII by H2O2 was dose dependent (Figure 1C). The concentration of EGTA

Easy access to figures…



Easy access to figures and their context



Simultaneous view of text, figures, and caption

Article ◀ ▶ Article PDF (1805 KB) Extended Article PDF (3763 KB)

Cell, Volume 140, Issue 1, 62-73, 8 January 2010 | Copyright © 2010 Elsevier Inc. All rights reserved. | 10.1016/j.cell.2009.12.007

Biological and Molecular Heterogeneity of Breast Cancers Correlates with Their Cancer Stem Cell Content

Salvatore Pece ✉, Daniela Tosoni, Stefano Confalonieri, Giovanni Mazzarol, Manuela Vecchi, Simona Ronzoni, Loris Bernard, Giuseppe Viale, Pier Giuseppe Pelicci ✉, Pier Paolo Di Fiore ✉ See Affiliations

Summary | Introduction | Results | Discussion | Exp. Proc. | Data | References | Supp. Info. | Related Info. | Comments (0)

Text | References

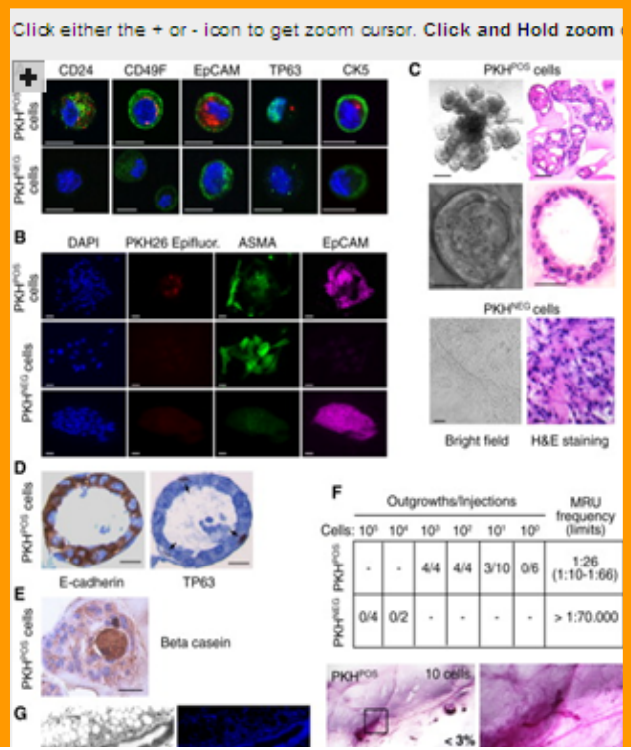
See Full-screen View.

High Quality Figure (1295 kb)

efficiency of around 4% (one in 26 cells, range 1:10–66), while PKH^{NEG} cells could not reconstitute the mammary gland, even when injected at concentrations as high as 10^5 cells/transplant (Figure 2F). Of note, this value is compatible with the maximum expected value of reconstitution, estimated on the basis of the replicative kinetics of PKH^{POS} cells (Figure S1E). The outgrowths generated by PKH^{POS} cells displayed the normal mammary gland cytoarchitecture (Figure 2G, Figure S2C) and were derived unequivocally from transplanted human cells (Figure 2G, Figure S2D).

Transcriptomic Analysis of hNMSCs

Click either the + or - icon to get zoom cursor. Click and Hold zoom



or to zoom in or out. The mouse wheel can also be used

Figure 2. Immunophenotypical and Functional Characterization of PKHPOS and PKHNEG Cells

(A) PKH^{POS} or PKH^{NEG} cells were analyzed with the indicated antibodies by IF. Green, antibody staining; red, PKH26 epifluorescence; blue, DAPI. Scale bars represent 10 μm. Quantification is shown in Figure S2A. Results are typical and representative of three independent experiments. (B) PKH^{POS} or PKH^{NEG} cells were grown on Matrigel and analyzed in IF with the indicated antibodies. Scale bars represent 10 μm. Quantification is

References: context and filtering

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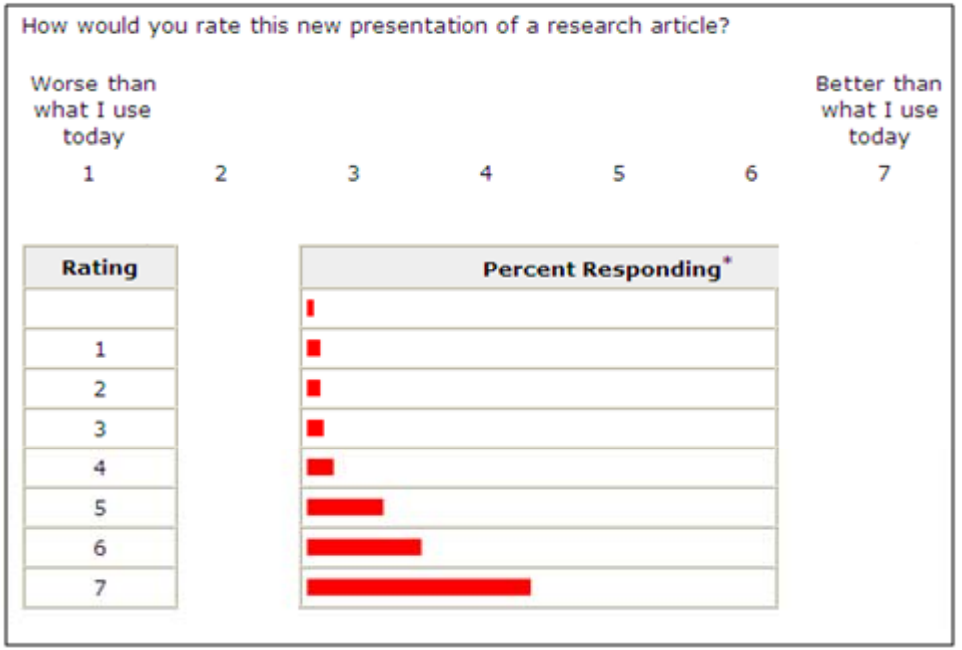
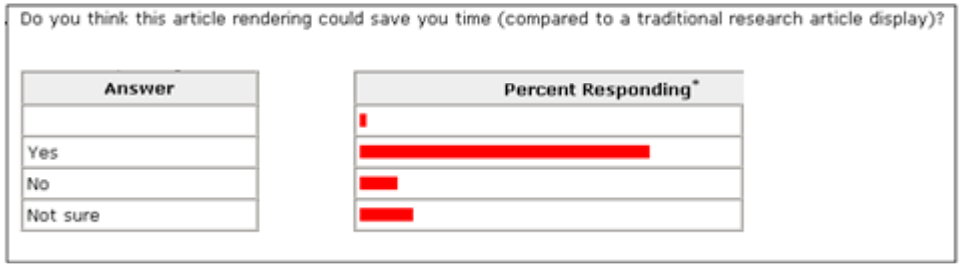
Results and feedback: Mostly positive

- Survey with > 500 respondents
  - 80% positive
  - 10% neutral
  - 10% negative

- Comments:
  - Fantastic -- wish I thought of it!
  - It looks absolutely amazing.
  - It is simple and practical!
  - More transparent - less scrolling!
  - I like the graphical overviews.
  - Quickly understand concepts.
  - A way to quickly distil the essence.
  - I like "clickable" summary figures.
  - Much-needed change in format.
  - Radically better than what I use





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Article of the Future is domain specific

- Follow Cell Press Article-of-the-Future example
- Focus on domain-specific presentation, format, and contents
- Process:
  - Dive into domain specific user needs
  - Define domain specific enhancements for those needs
  - Create domain specific prototype with enhancements
  - Collaborate with domain specific research community via discussion forums and prototype sites
  - Prepare requirements for article production and ScienceDirect
- Beginning with:
  - Chemistry
  - Psychology
  - Materials Science
  - Parasitology
  - Mathematics
  - …

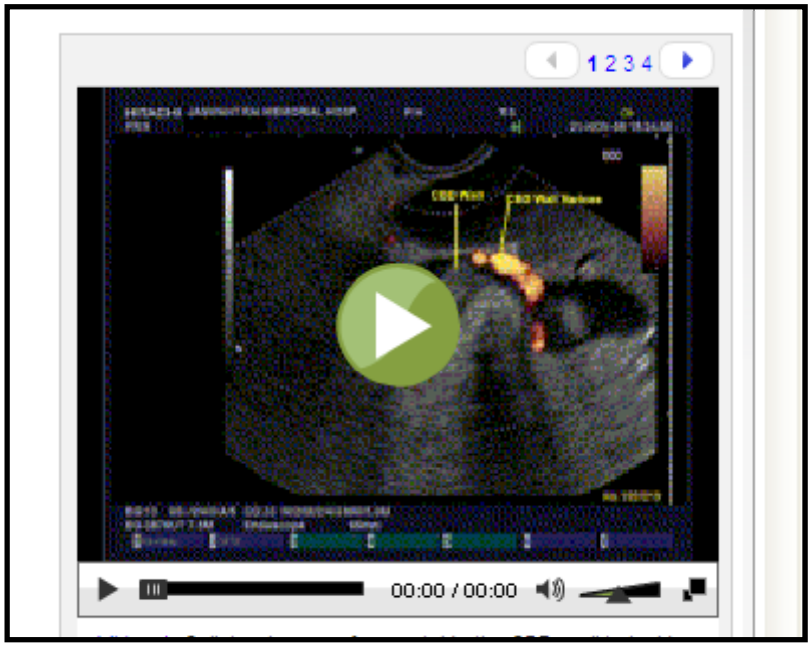
Article of the Future: preparation

- ScienceDirect must support:
  - 2009: Video
  - 2010: Graphical Abstracts and Research Highlights
  - 2010/11: In-line supplementary data
  - 2011: Tabbed view and figure filmstrip

Streaming inline video

- Increasing use of videos
- In increasing # disciplines
  - Life sciences: cell movements
  - Social sciences: observations
  - Mathematics: explanations
  - Methods and protocols

- ScienceDirect support:
  - Download (from 2002)
  - Streaming (from 2009)
  - Inline (from 2010)



PDF (297 K) | Export Citation | E-mail Article

Article | Figures/Tables (8) | References (17)

Thumbnails | Full-Size Images

Cognitive and Behavioral Practice
Article in Press, Corrected Proof - Note to users

doi:10.1016/j.cbpra.2009.09.002 | How to Cite or Link Using DOI

Contains Video1

Description and Demonstration of CBT for ADHD in Adults

Susan E. Sprich[a, *], Laura E. Knouse[a], Christine Cooper-Vince[a], Jennifer Burbridge[a] and Steven A. Safren[a]

[a] Massachusetts General Hospital and Harvard Medical School

Received 31 July 2009; revised 28 August 2009; accepted 1 September 2009. Available online 14 December 2009.

Abstract

ADHD in adulthood is a valid, prevalent, distressing, and interfering condition. Although medications help treat this disorder, there are often residual symptoms after medication treatment, and, for some patients, they are contraindicated. Compared to other disorders, such as mood and anxiety disorders, there are few res… treatment for this problem. Th… approach to treat ADHD in a… o, et al., 2005), and for w… & Otto, 2005; Safren, Sprich, Perlman, & Otto, 2005). To augment the description of treatment, the present article provides video component demonstrations of several core modules that highlight important aspects of this treatment. This description and the accompanying demonstrations are intended as a practical

- Not as supplement but
- ... inline similar to a figure

Supplementary Content within this Article

1 2 3 4 5 6 7 8

Video 1. Setting up the calendar system.

View within Article | Download this Video

Related Articles

- Cognitive-behavioral therapy for ADHD in medication-tre…
  Behaviour Research and Therapy
- The Clinician's Role in the Treatment of ADHD
  Clinician's Guide to Adult ADHD
- History of childhood attention deficit hyperactivity di…
  Journal of Affective Disorders
- QEEG and neurofeedback for assessment and effective int…
  Introduction to Quantitative EEG and Neurofeedback

video component mentions that she does not have a consistent system for keeping track of her tasks and often ends up working on lower-priority tasks first and then realizing that she has missed an important task. This gives the therapist the opportunity to reiterate the importance of looking at the task list every day and then he and the client are able to agree on a time when she will do this on a consistent basis (when she first arrives at work each day).

Help
Download this Video (33275 K)

Setting up the task list. Video 2.

- Not as supplement but
- ... inline similar to a figure

Problem Solving

"Steve" is a 38-year-old man. At this stage of the treatment, he would have already worked on developing a calendar and task list system and a system for using priority ratings for task list items. The goal of this session is to teach him to use problem solving to deal with items on his task list that are overwhelming or where there is not a clear solution. This session is framed as teaching skills to help with tasks that end up being pushed off from day to day or week to week. When the individual either feels overwhelmed by the task or does not really know how to approach it, avoidance is often the result. Avoidance of difficult or overwhelming tasks often makes the individual feel better in the short-term, but can cause problems in the long-term. As illustrated in the example that follows, the therapist helps the client (a) articulate the problem, (b) generate a list of potential solutions, (c) rate the solutions, and (d) pick the best solution.

Articulate the Problem

Video clip 3 illustrates a situation that we often encounter, where a client gets so overwhelmed and upset by their difficulties that they have a hard time even articulating the problem. The therapist must refocus the discussion on articulating the problem to be solved in a concise manner. After many attempts, during which the client makes self-critical remarks and extreme statements about his situation, the

2010: Graphical Abstracts and Research Highlights

2010/11: In-line supplementary data

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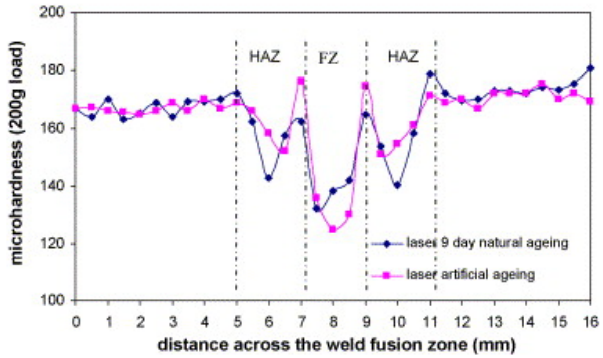
http://oxdaps5.elsevier.co.uk/sciencedirect2008-2/

Microsoft Outlook Web Access | ScienceDirect - View Article

HAZ was found to decrease with decreasing heat input. In fact autogenous laser welding produced the na
HAZ and the results of the micro-hardness of laser weld measurements are shown in Fig. 7.



Intracellular Calcium Concentration Measurements

Intracellular calcium concentration was assessed by Fura-2 fluorescence ratio imagi a microsc
digital imaging system (Photon Technology International), as described previously (S a et al., 1995).

Intracellular calcium concentration

Fluorescence Measurements

Spectra were collected at 30 C using a Fluorolog 3 (Jobin Yvon, Horiba) spectrofluorometer. For intrinsic fluorescence shift experiments, excitation wavelength was 270 nm. Emission spectra were generated at increments from 280 nm to 400 nm. Background traces were subtracted from CaMKII spectra to eliminat contribution from intrinsic fluorescence of CaM. For fluorescence anisotropy experiments, baseline traces of 100 nM dansylated CaM in 15 mM HEPES buffer (pH 7.2) were measured at baseline and after the add 200 M CaCl2 at 60 s. At 180 s, 100 nM purified CaMKII was added to the CaM solution. For some trials, CaMKII became phosphorylated by the addition of 10 mM ATP. One hundred microliters H2O2 or an equi volume of buffer was added at 250 s. Finally, addition of 10 mM EGTA at 300 s was used to remove free calcium from the solution, uncoupling CaM/CaMKII binding.

Cardiomyocyte TUNEL Immunostaining

Myocyte isolations from neonatal mouse or rat pups were modified from previously described methods (et al., 2007). To ensure that pure populations of cardiomyocytes were obtained, cultures were immunolab with a-actinin Ig (cardiomyocyte-specific marker). Only cultures with > 90% cardiomyocytes were used in

Done

Supplementary Data

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http://oxdaps5.elsevier.co.uk/sciencedirect2008-2/rel004.php

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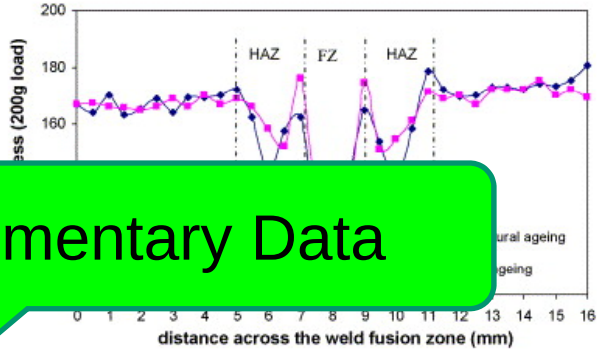

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Intracellular calcium concentration

Intracellular calcium concentration was assessed by Fura-2 fluorescence ratio imaging using a microscopic digital imaging system (PhotonTechnology International), as described previously (Sharma et al., 1995). Briefly, cultured primary cardiac myocytes were loaded with the Ca2+-specific dye Fura-2 by incubating with 1 M Fura-2AM (Molecular Probes) at 37 C for 30 minutes. [Ca2+]I values over the entire cell were calculated from the 340/380-nm ratio images of Fura-2 fluorescence captured before, during and after Iso (100nM) or AngII (100nM) stimulation.

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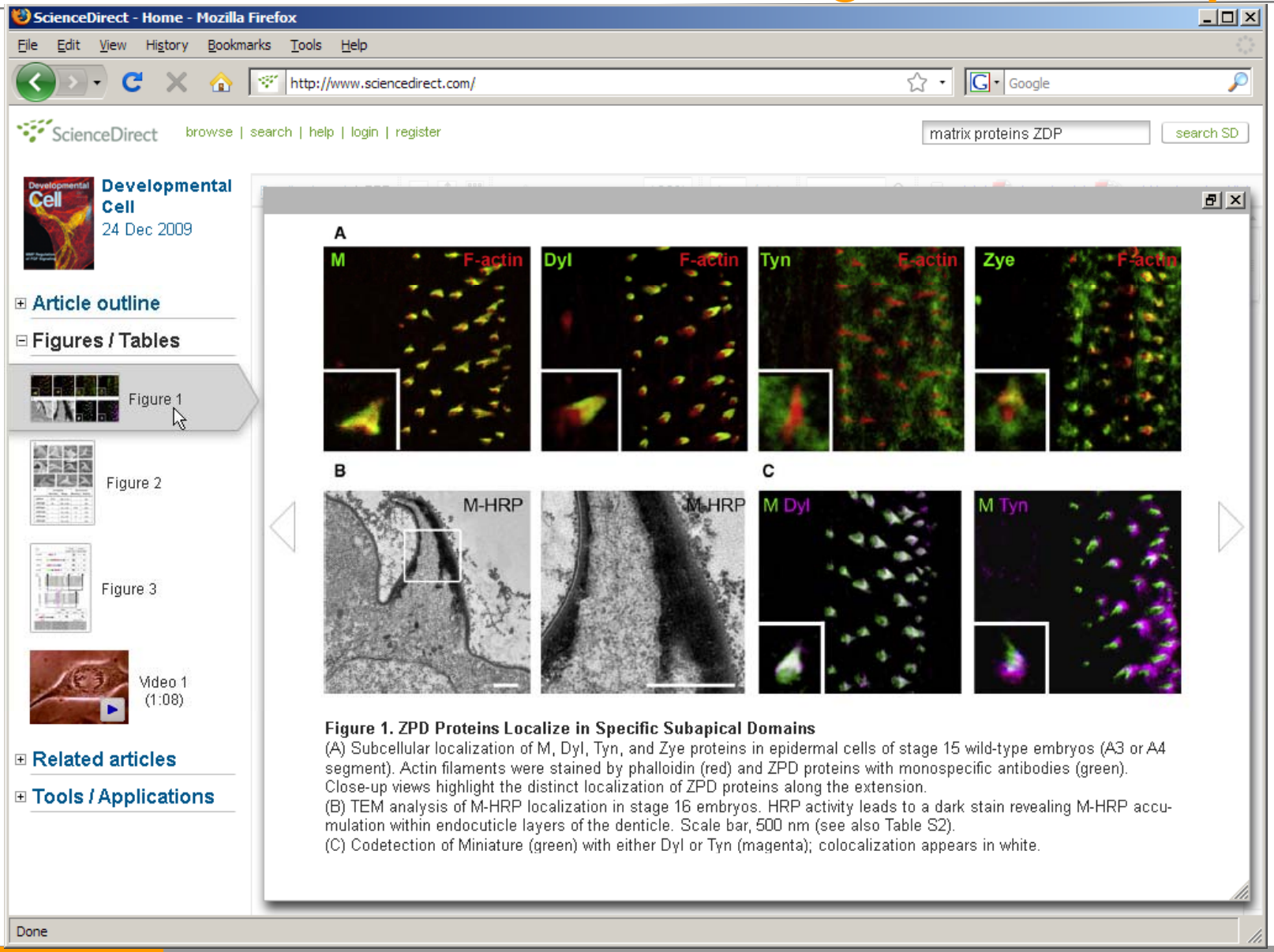
Done

2011: Tabbed view and figure filmstrip



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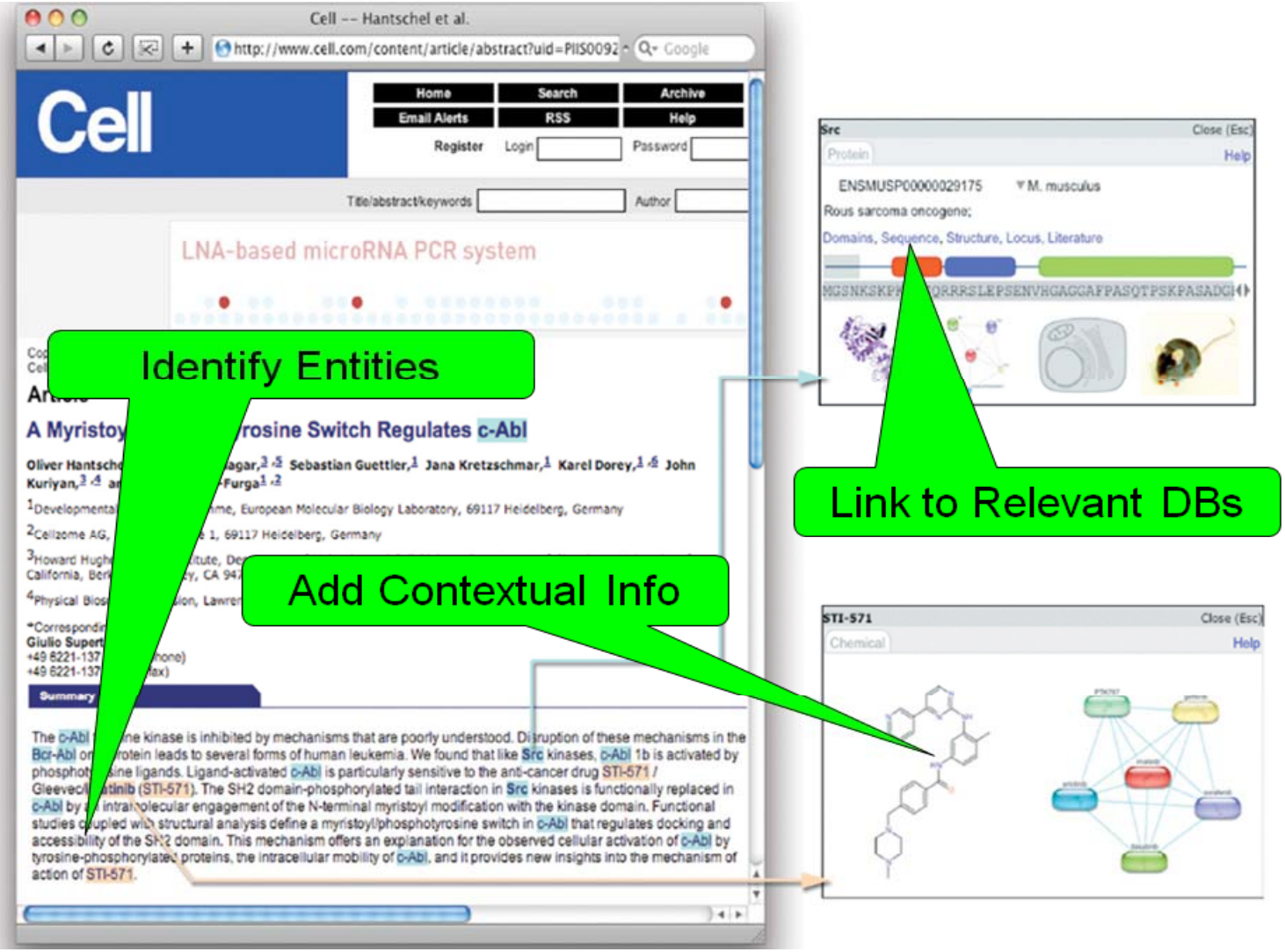
Where are semantics, contextual linking?

Reflect: Elsevier Grand Challenge Winner



Use of Reflect: survey results

- Most useful terms were highlighted
- Information provided was useful
- Majority wants to see this continued
- Less than 10% would never use it
- Preference for Reflect to be switched on by default
- Equal preference for in-text or as side-bar
- Many suggestions for other entities to mark up

- Conclusion: we will bring this to ScienceDirect
- And also investigate for other disciplines

Content Innovation – Summary

- Focus on discipline specificity
  - Different article presentations for different disciplines
  - Started with Life Sciences – extend to other disciplines
- Increase Interoperability
  - Allow for contextual linking applications
  - Collaborate with external databases
- Use external applications to add value
- Planning
  - Started in 2009 with basic functionality
  - Increases in 2010 with additional features
  - Further implementation in 2011 and later

Content Innovation – Questions?

Thank you!