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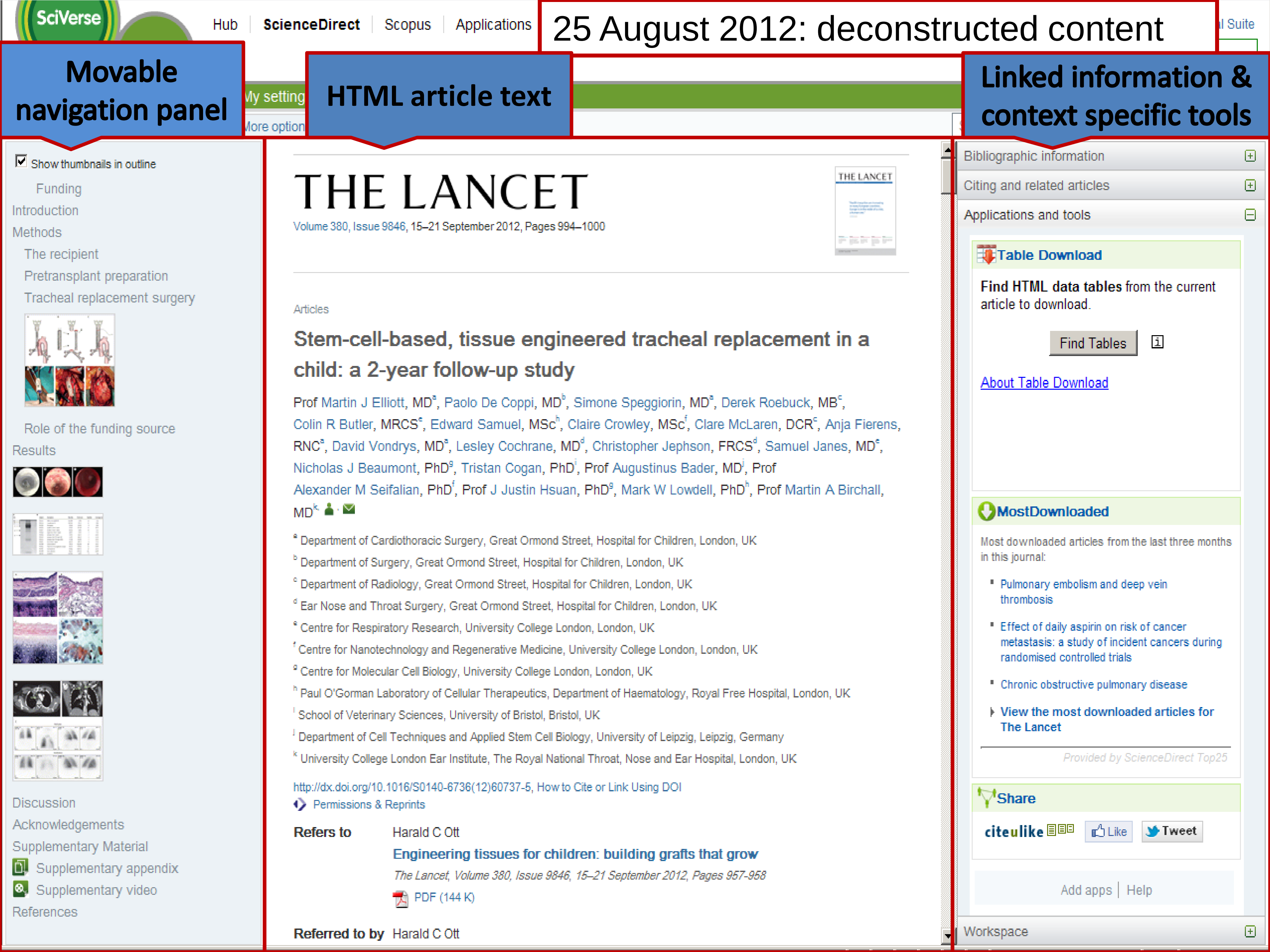

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THE LANCET

Volume 380, Issue 9846, 15–21 September 2012, Pages 994–1000

Articles

Stem-cell-based, tissue engineered tracheal replacement in a child: a 2-year follow-up study

Prof Martin J Elliott, MD[a], Paolo De Coppi, MD[b], Simone Speggiorin, MD[a], Derek Roebuck, MB[c], Colin R Butler, MRCS[a], Edward Samuel, MSc[h], Claire Crowley, MSc[f], Clare McLaren, DCR[c], Anja Fierens, RNC[a], David Vondrys, MD[a], Lesley Cochrane, MD[d], Christopher Jephson, FRCS[d], Samuel Janes, MD[e], Nicholas J Beaumont, PhD[g], Tristan Cogan, PhD[i], Prof Augustinus Bader, MD[j], Prof Alexander M Seifalian, PhD[f], Prof J Justin Hsuan, PhD[g], Mark W Lowdell, PhD[h], Prof Martin A Birchall, MD[k]

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http://dx.doi.org/10.1016/S0140-6736(12)60737-5, How to Cite or Link Using DOI

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Refers to Harald C Ott
Engineering tissues for children: building grafts that grow
The Lancet, Volume 380, Issue 9846, 15–21 September 2012, Pages 957-958
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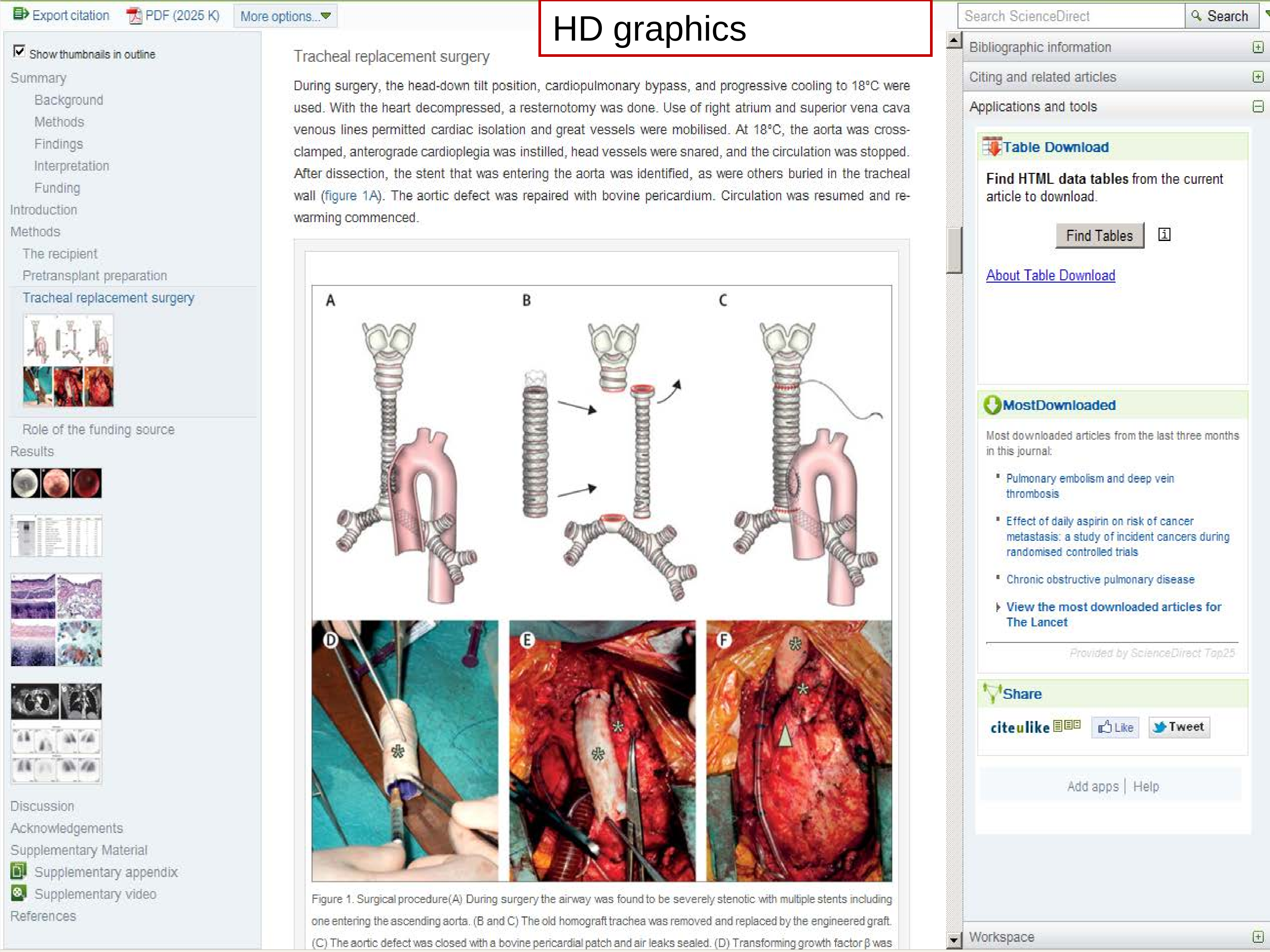

Tracheal replacement surgery

During surgery, the head-down tilt position, cardiopulmonary bypass, and progressive cooling to 18°C were used. With the heart decompressed, a resternotomy was done. Use of right atrium and superior vena cava venous lines permitted cardiac isolation and great vessels were mobilised. At 18°C, the aorta was cross-clamped, anterograde cardioplegia was instilled, head vessels were snared, and the circulation was stopped. After dissection, the stent that was entering the aorta was identified, as were others buried in the tracheal wall (figure 1A). The aortic defect was repaired with bovine pericardium. Circulation was resumed and re-warming commenced.

Figure 1. Surgical procedure(A) During surgery the airway was found to be severely stenotic with multiple stents including one entering the ascending aorta. (B and C) The old homograft trachea was removed and replaced by the engineered graft. (C) The aortic defect was closed with a bovine pericardial patch and air leaks sealed. (D) Transforming growth factor β was

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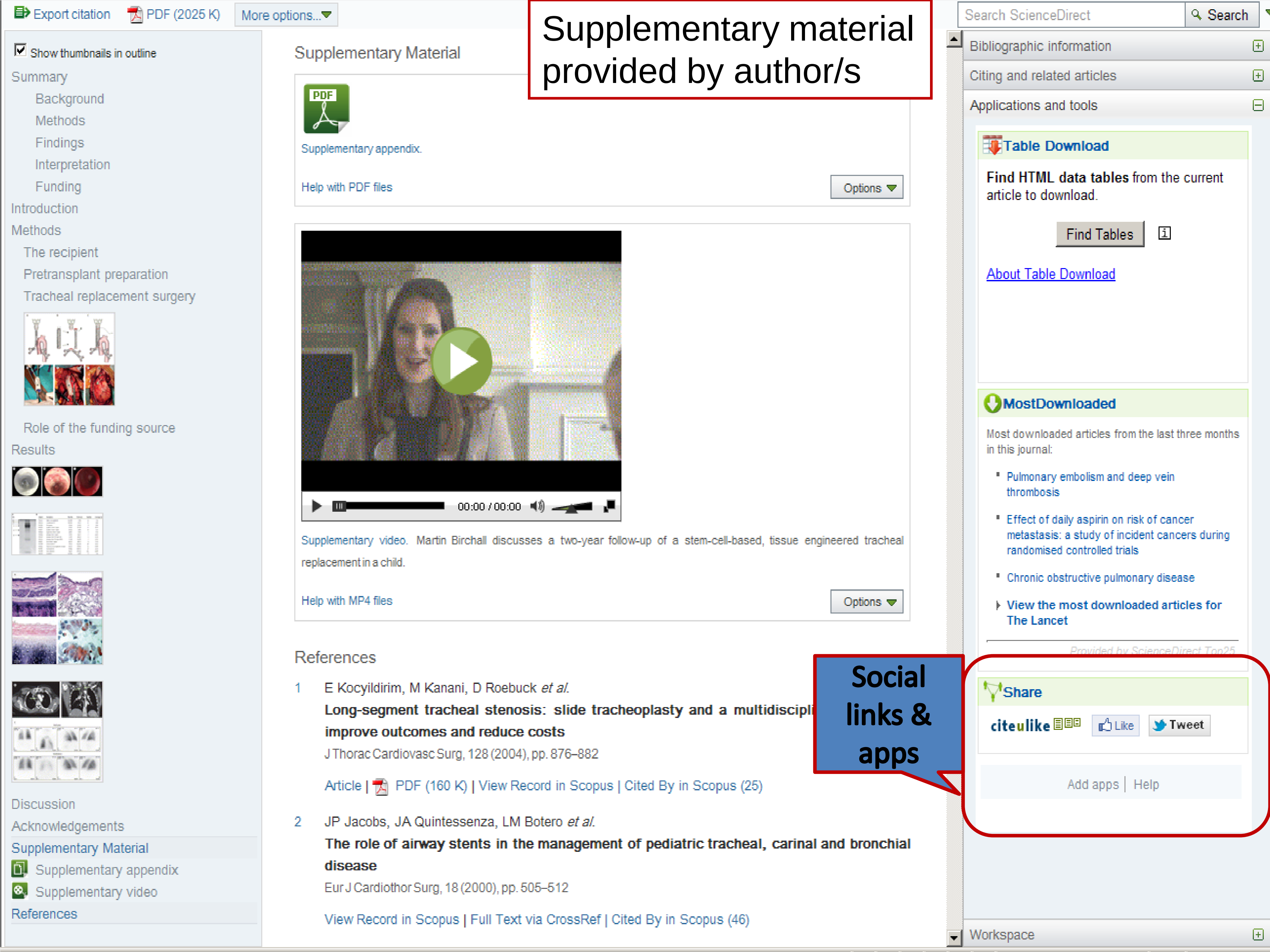

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Supplementary appendix.

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Supplementary video. Martin Birchall discusses a two-year follow-up of a stem-cell-based, tissue engineered tracheal replacement in a child.

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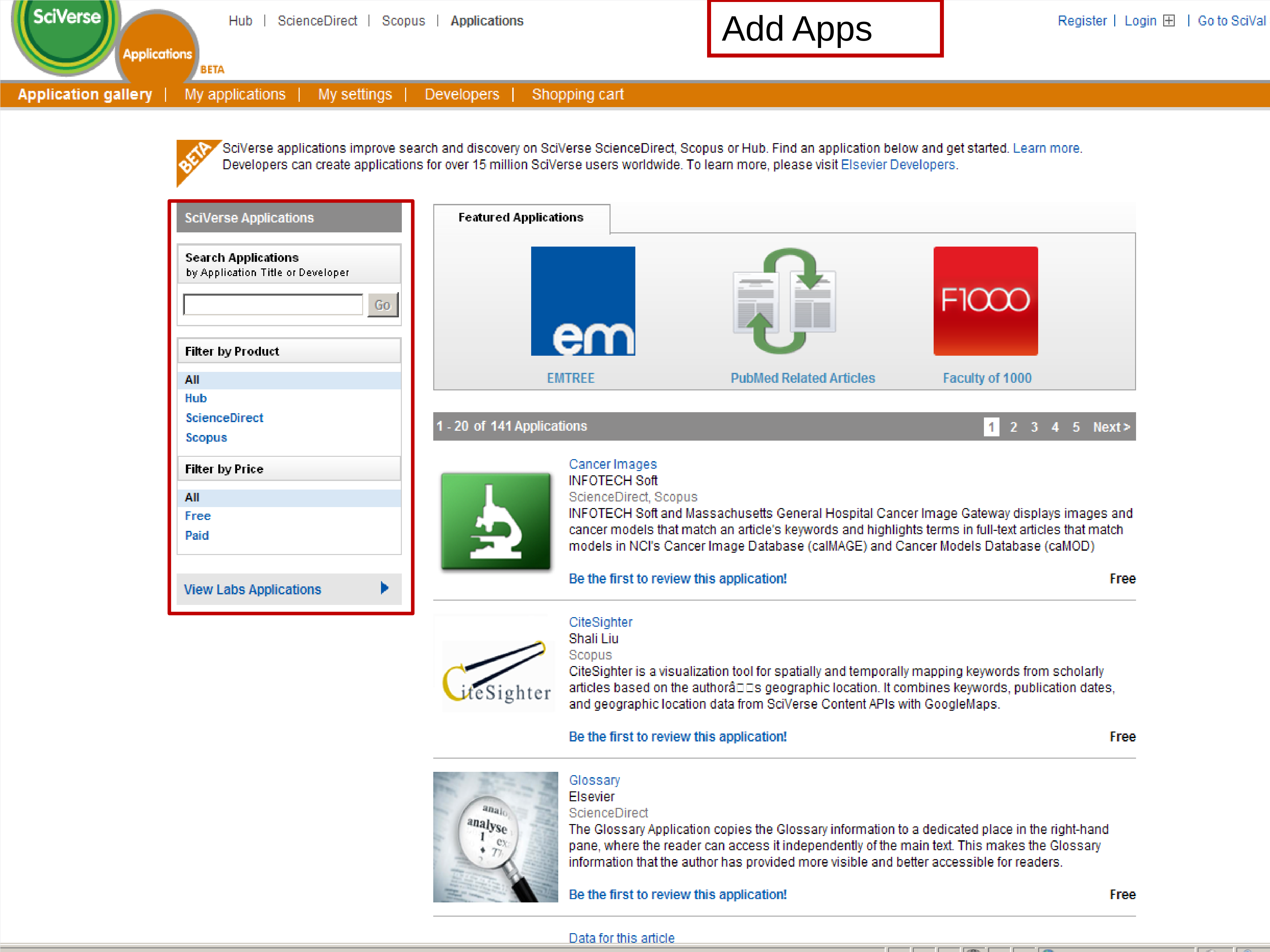

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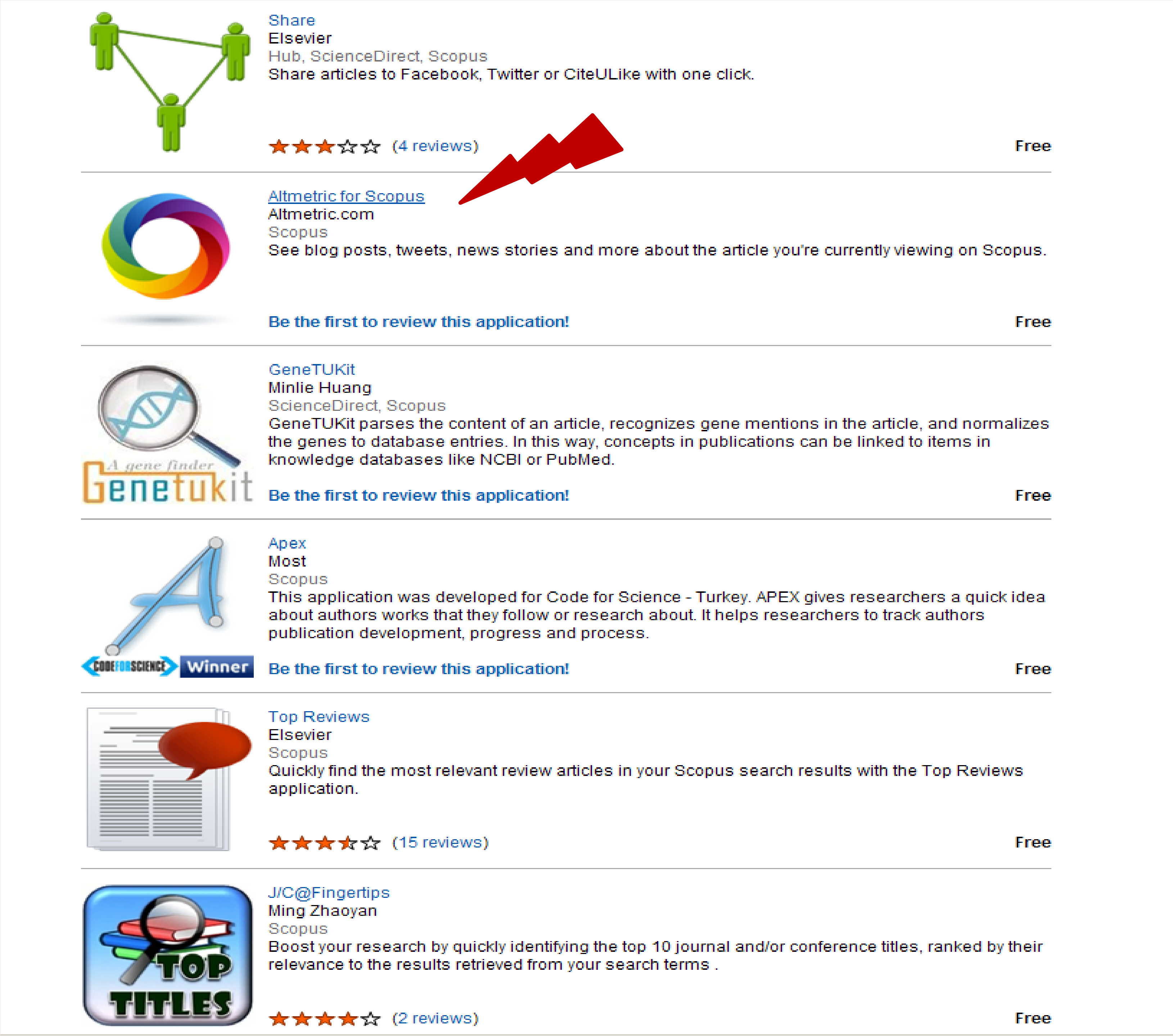

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The Journal of Academic Librarianship

Volume 38, Issue 5, September 2012, Pages 294–310

An Analysis and Allocation System for Library Collections Budgets: The Comprehensive Allocation Process (CAP)

Lucy Eleonore Lyons, John Blosser

Electronic Resources and Collection Analysis Department, University Library, Northwestern University, 1970 Campus Drive, Evanston, IL 60208-2300, USA

http://dx.doi.org/10.1016/j.acalib.2012.07.006, How to Cite or Link Using DOI

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Abstract

The "Comprehensive Allocation Process" (CAP) is a reproducible decision-making structure for the allocation of new collections funds, for the reallocation of funds within stagnant budgets, and for budget cuts in the face of reduced funding levels. This system was designed to overcome common shortcomings of current methods. Its philosophical foundations include the values of accountability, transparency, and efficiency. It features a conceptual framework, quantitative data, qualitative evidence, and data analysis and allocation techniques.

Keywords

Allocation methods; Allocation models; Library budgets; Collections budgets; Qualitative analysis; Quantitative analysis

Introduction

This work offers: a reproducible collections budget allocation system that is fully adaptable to every type of library; a powerful tool that tests the appropriateness of current allocations; and a course of action applicable to all budget situations including fund allocation, reallocation, and reduction. The Collections Allocation

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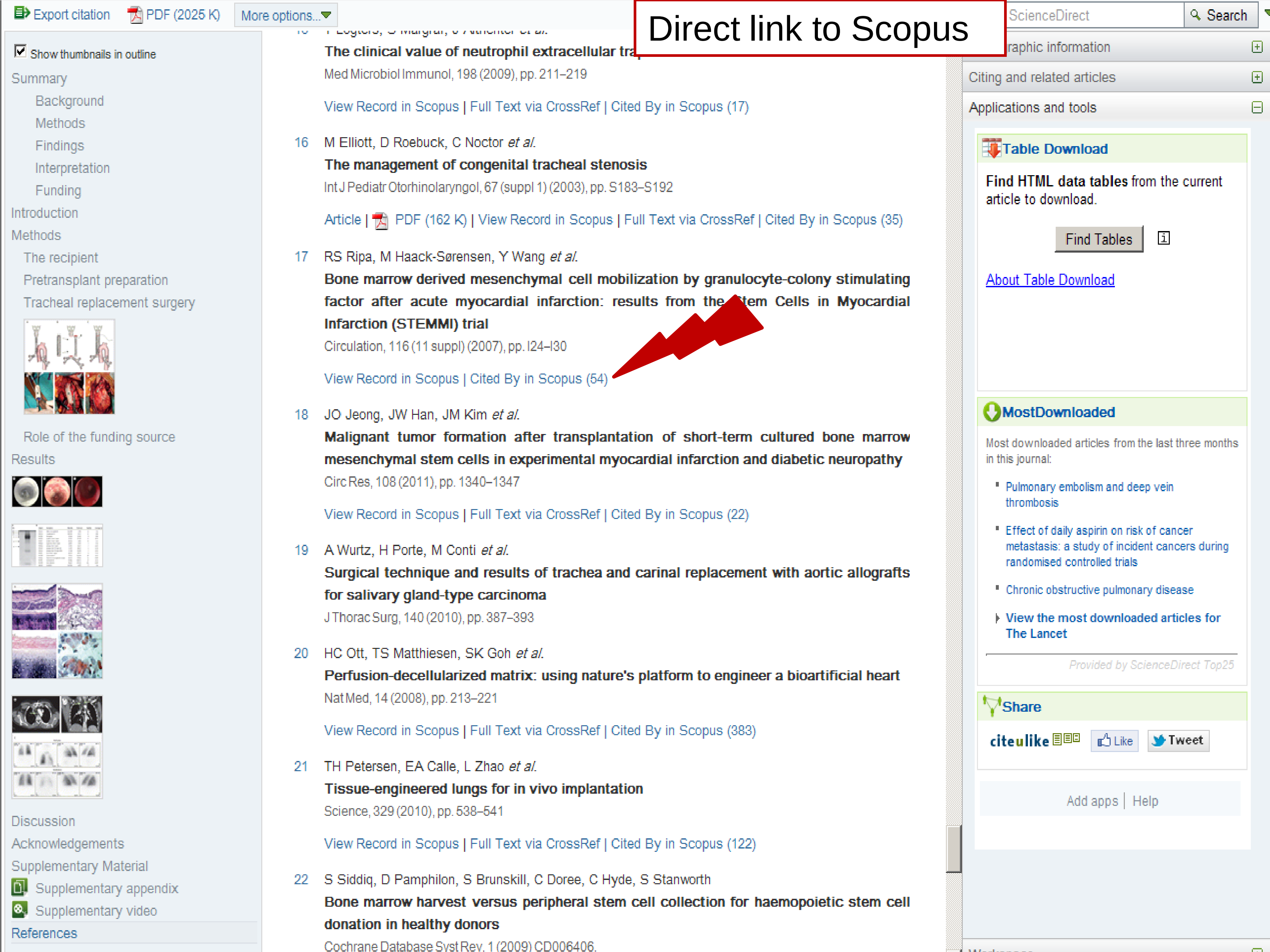

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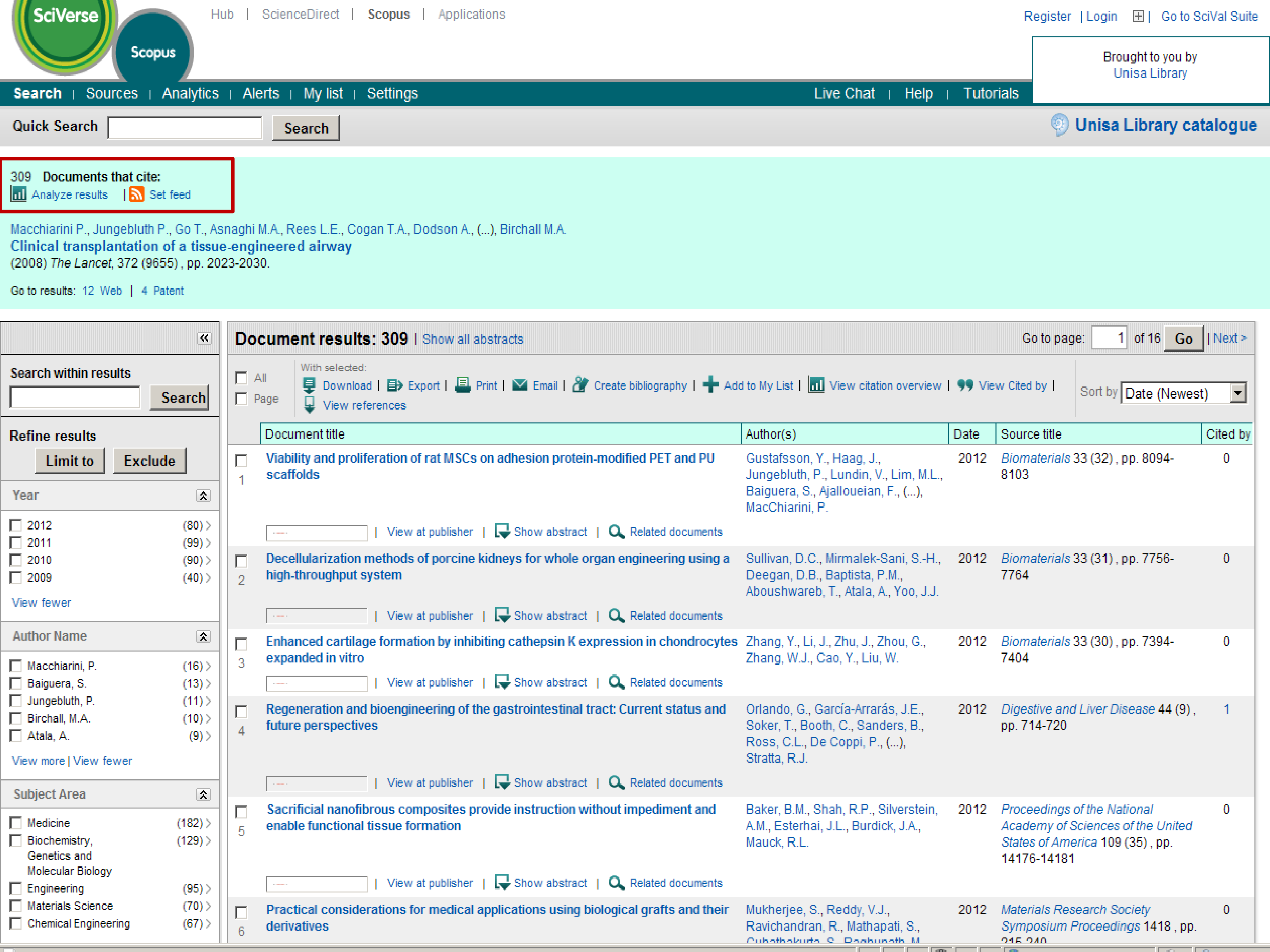

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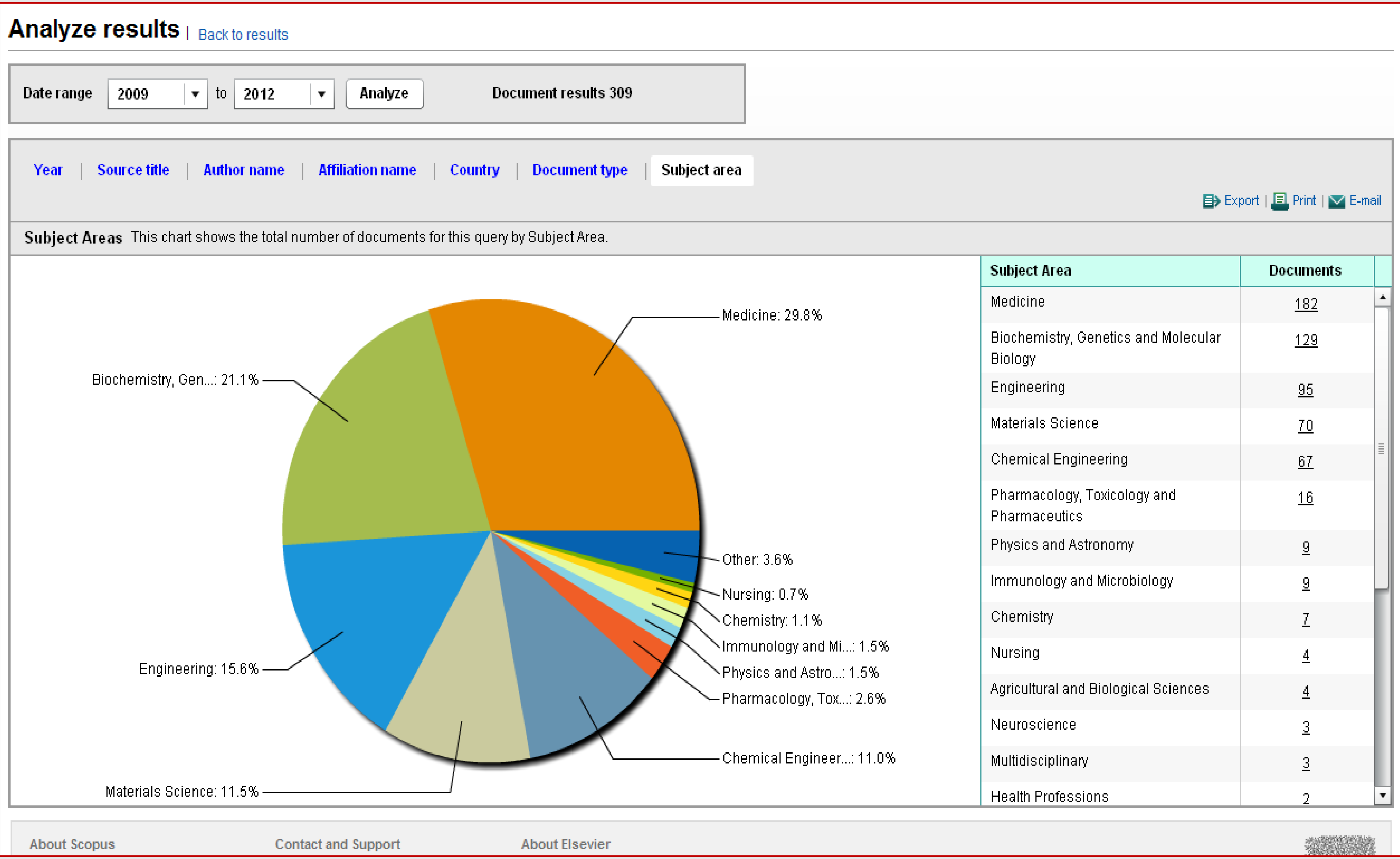

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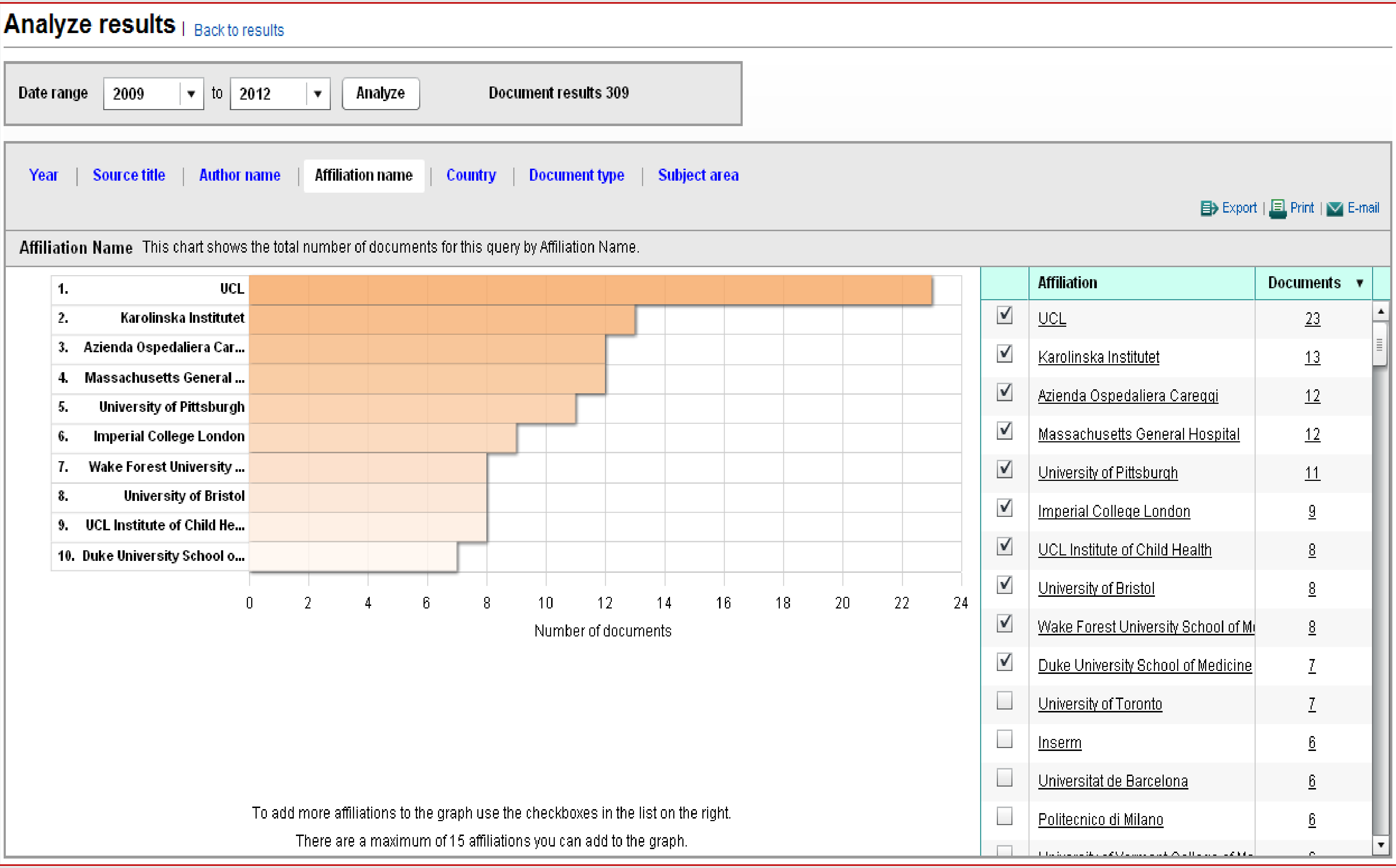

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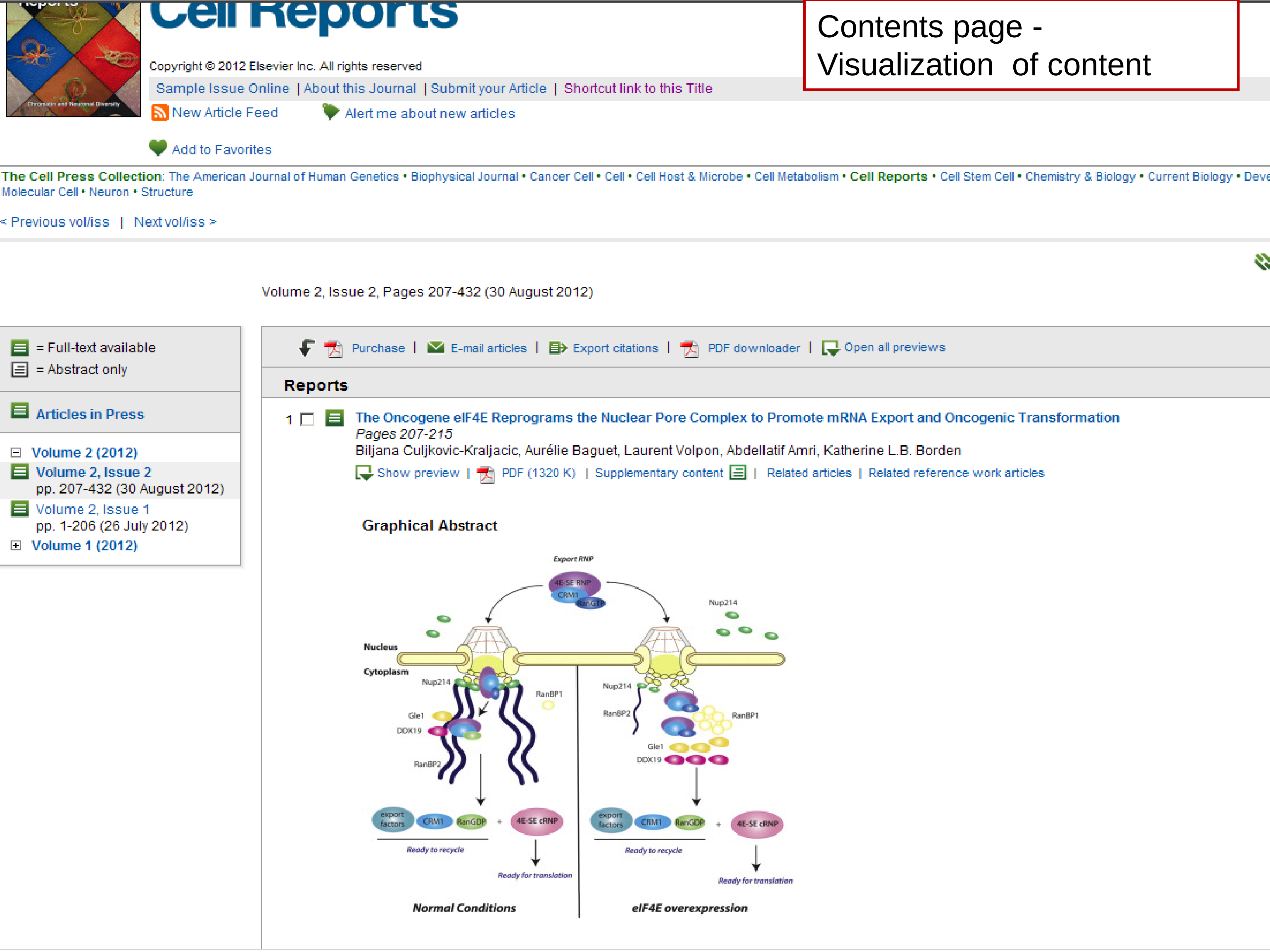

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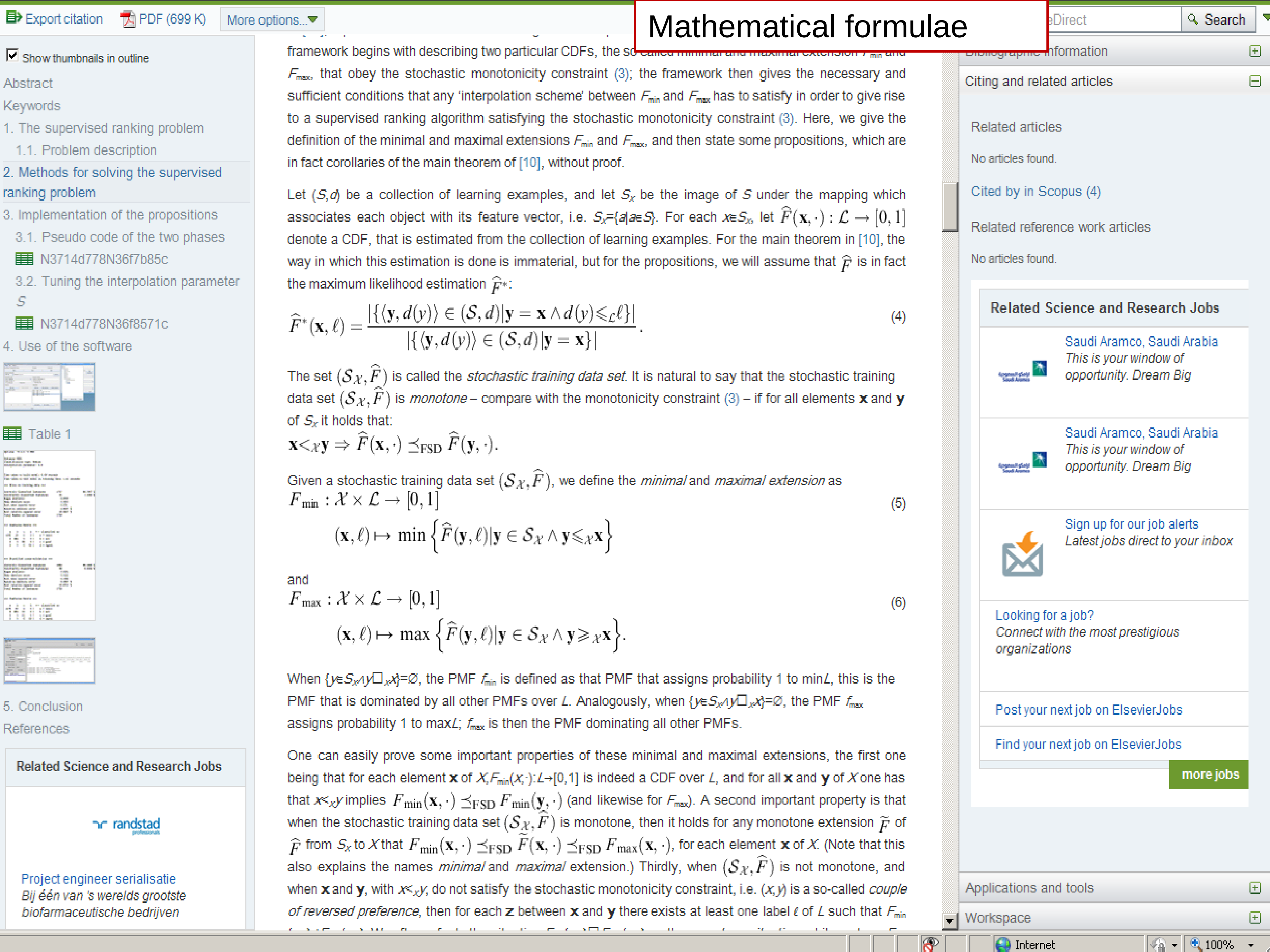

framework begins with describing two particular CDFs, the so $_{\min}$ and $F_{\max}$, that obey the stochastic monotonicity constraint (3); the framework then gives the necessary and sufficient conditions that any 'interpolation scheme' between $F_{\min}$ and $F_{\max}$ has to satisfy in order to give rise to a supervised ranking algorithm satisfying the stochastic monotonicity constraint (3). Here, we give the definition of the minimal and maximal extensions $F_{\min}$ and $F_{\max}$, and then state some propositions, which are in fact corollaries of the main theorem of [10], without proof.

Let (S,d) be a collection of learning examples, and let S_X be the image of S under the mapping which associates each object with its feature vector, i.e. $S_X=\{a|a\in S\}$. For each $x\in S_X$, let $\widehat{F}(\mathbf{x},\cdot):\mathcal{L}\to[0,1]$ denote a CDF, that is estimated from the collection of learning examples. For the main theorem in [10], the way in which this estimation is done is immaterial, but for the propositions, we will assume that $\widehat{F}$ is in fact the maximum likelihood estimation $\widehat{F}^*$:

$$\widehat{F}^*(\mathbf{x},\ell)=\frac{|\{\langle\mathbf{y},d(y)\rangle\in(\mathcal{S},d)|\mathbf{y}=\mathbf{x}\wedge d(y)\leqslant_{\mathcal{L}}\ell\}|}{|\{\langle\mathbf{y},d(y)\rangle\in(\mathcal{S},d)|\mathbf{y}=\mathbf{x}\}|}. \tag{4}$$

The set $(\mathcal{S}_{\mathcal{X}},\widehat{F})$ is called the *stochastic training data set*. It is natural to say that the stochastic training data set $(\mathcal{S}_{\mathcal{X}},\widehat{F})$ is *monotone* – compare with the monotonicity constraint (3) – if for all elements **x** and **y** of S_X it holds that:

$$\mathbf{x}<_{\mathcal{X}}\mathbf{y}\Rightarrow\widehat{F}(\mathbf{x},\cdot)\preceq_{\mathrm{FSD}}\widehat{F}(\mathbf{y},\cdot).$$

Given a stochastic training data set $(\mathcal{S}_{\mathcal{X}},\widehat{F})$, we define the *minimal* and *maximal extension* as

$$F_{\min}:\mathcal{X}\times\mathcal{L}\to[0,1] \tag{5}$$
$$(\mathbf{x},\ell)\mapsto\min\left\{\widehat{F}(\mathbf{y},\ell)|\mathbf{y}\in\mathcal{S}_{\mathcal{X}}\wedge\mathbf{y}\leqslant_{\mathcal{X}}\mathbf{x}\right\}$$

and

$$F_{\max}:\mathcal{X}\times\mathcal{L}\to[0,1] \tag{6}$$
$$(\mathbf{x},\ell)\mapsto\max\left\{\widehat{F}(\mathbf{y},\ell)|\mathbf{y}\in\mathcal{S}_{\mathcal{X}}\wedge\mathbf{y}\geqslant_{\mathcal{X}}\mathbf{x}\right\}.$$

When $\{y\in S_X\wedge y\Box_X x\}=\varnothing$, the PMF $f_{\min}$ is defined as that PMF that assigns probability 1 to $\min L$, this is the PMF that is dominated by all other PMFs over L. Analogously, when $\{y\in S_X\wedge y\Box_X x\}=\varnothing$, the PMF $f_{\max}$ assigns probability 1 to $\max L$; $f_{\max}$ is then the PMF dominating all other PMFs.

One can easily prove some important properties of these minimal and maximal extensions, the first one being that for each element **x** of X, $F_{\min}(x,\cdot):L\to[0,1]$ is indeed a CDF over L, and for all **x** and **y** of X one has that $x\leqslant_X y$ implies $F_{\min}(\mathbf{x},\cdot)\preceq_{\mathrm{FSD}}F_{\min}(\mathbf{y},\cdot)$ (and likewise for $F_{\max}$). A second important property is that when the stochastic training data set $(\mathcal{S}_{\mathcal{X}},\widehat{F})$ is monotone, then it holds for any monotone extension $\widetilde{F}$ of $\widehat{F}$ from S_X to X that $F_{\min}(\mathbf{x},\cdot)\preceq_{\mathrm{FSD}}\widetilde{F}(\mathbf{x},\cdot)\preceq_{\mathrm{FSD}}F_{\max}(\mathbf{x},\cdot)$, for each element **x** of X. (Note that this also explains the names *minimal* and *maximal* extension.) Thirdly, when $(\mathcal{S}_{\mathcal{X}},\widehat{F})$ is not monotone, and when **x** and **y**, with $x\leqslant_X y$, do not satisfy the stochastic monotonicity constraint, i.e. (x,y) is a so-called *couple of reversed preference*, then for each **z** between **x** and **y** there exists at least one label ℓ of L such that $F_{\min}$

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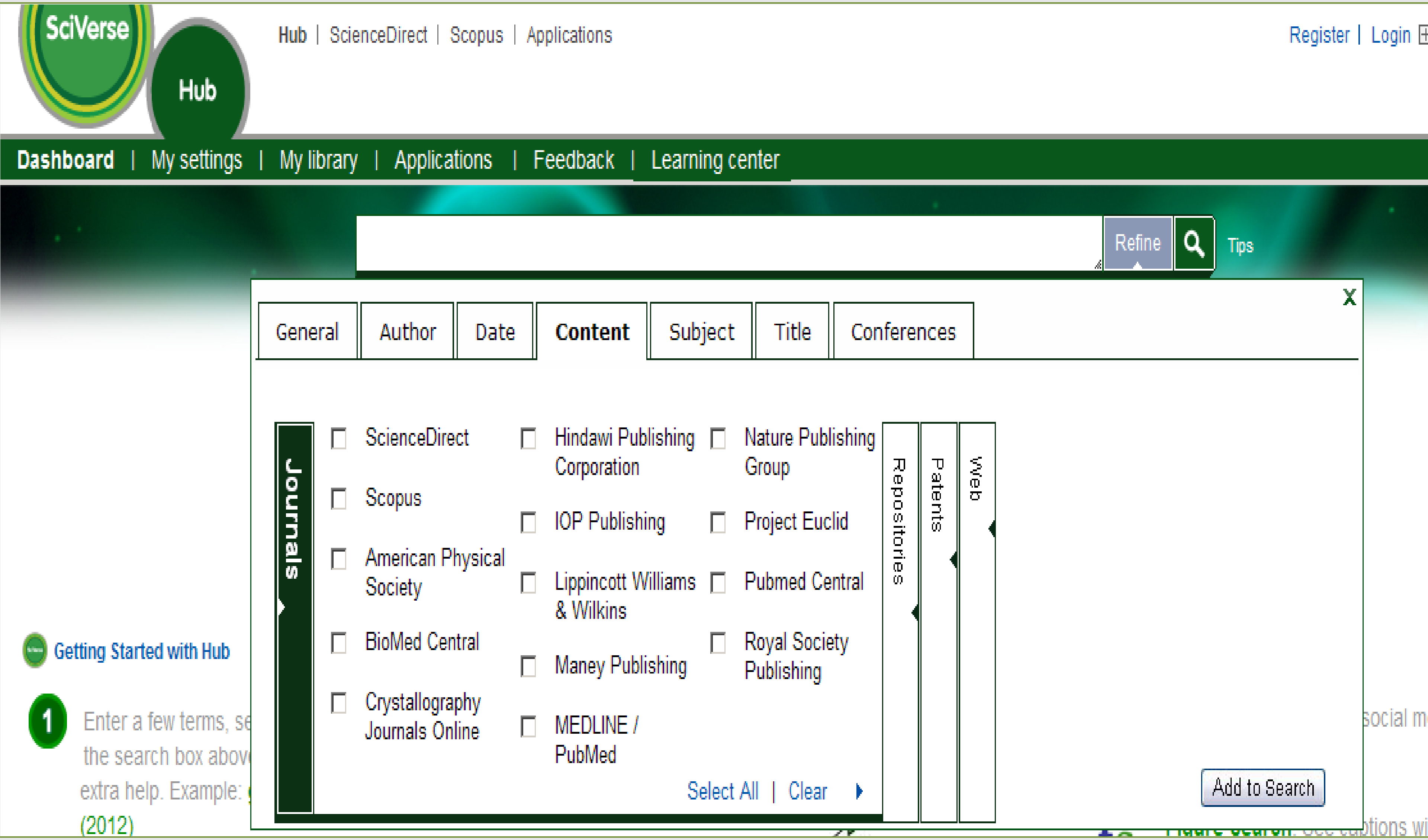

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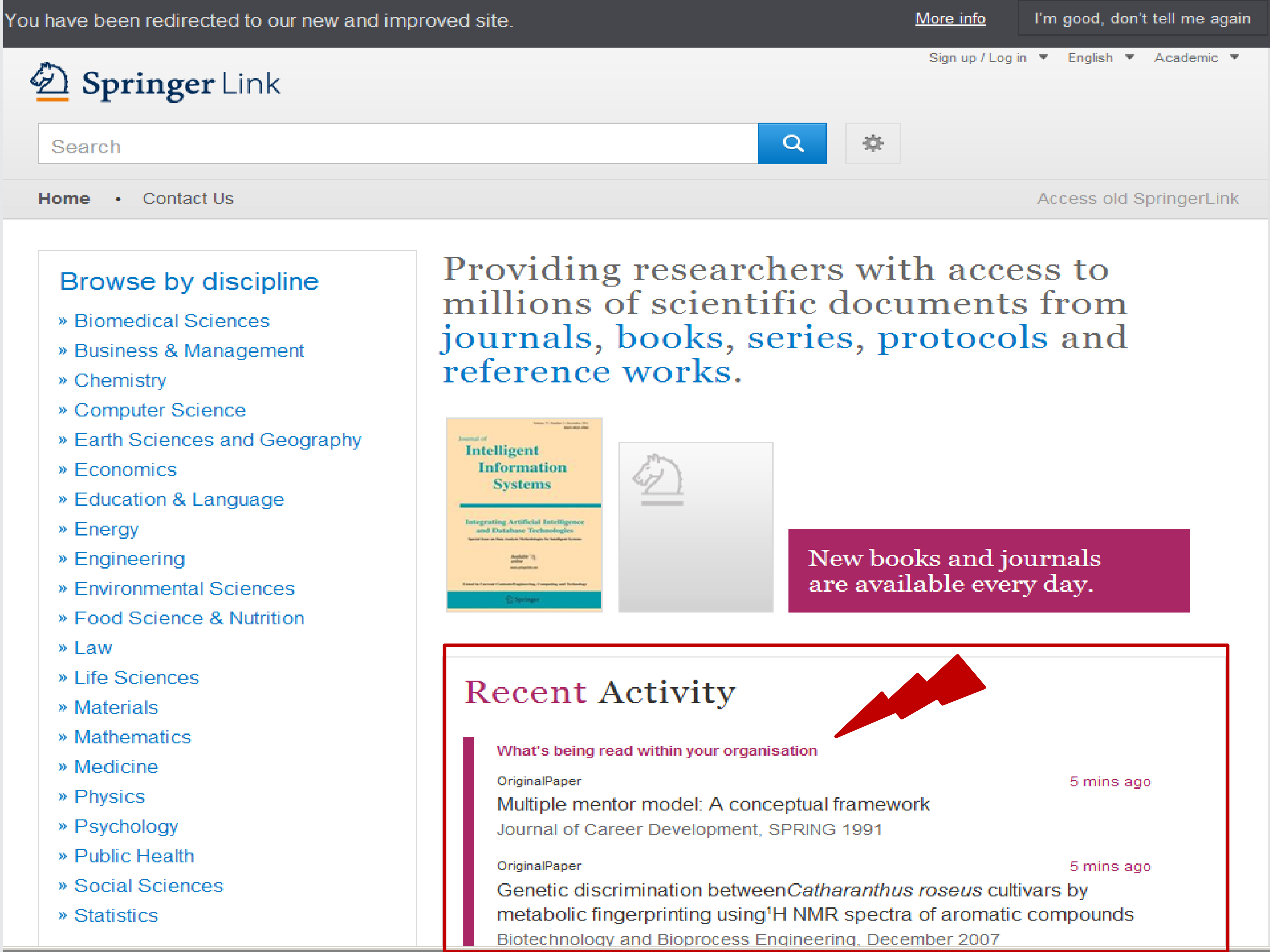

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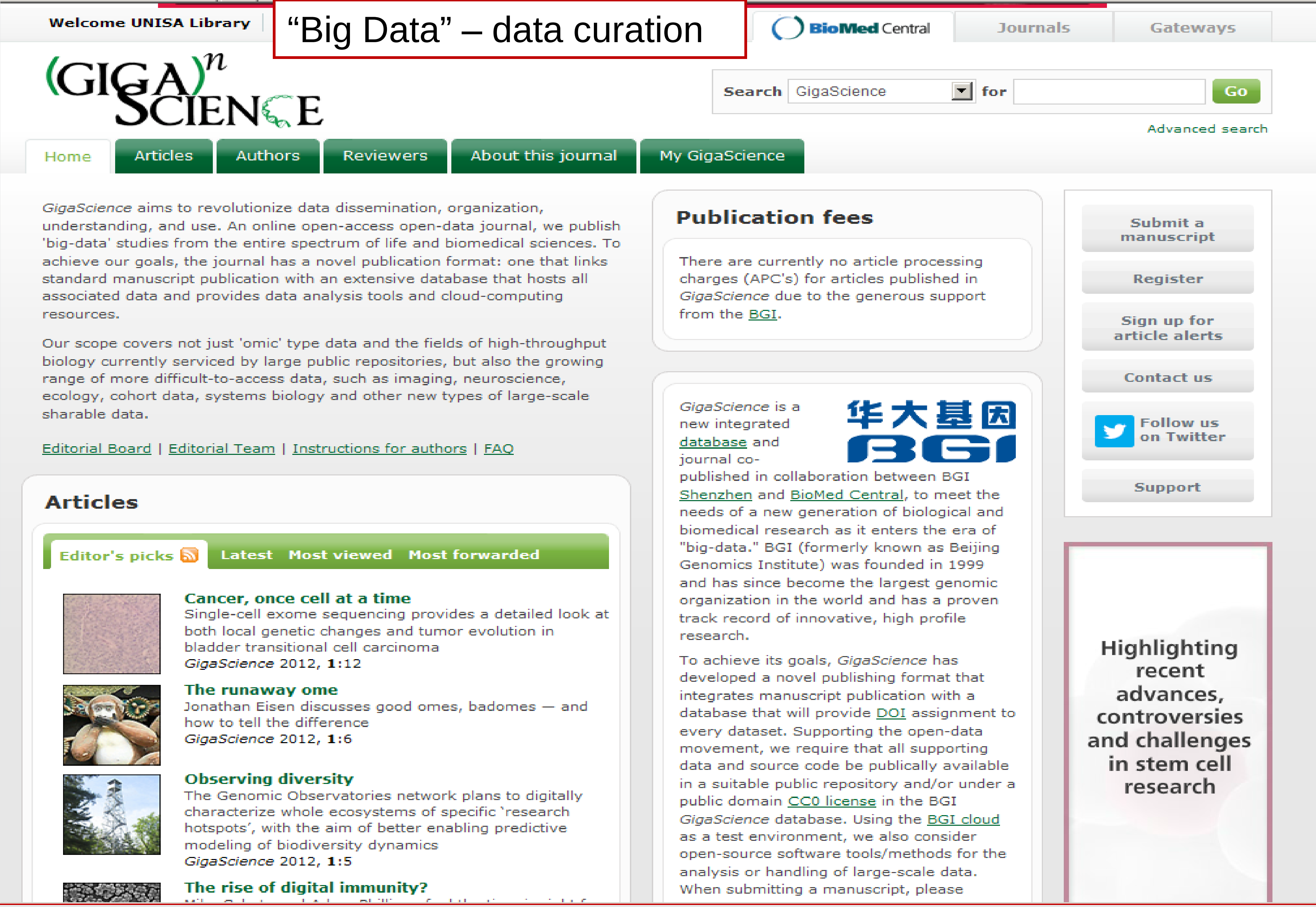

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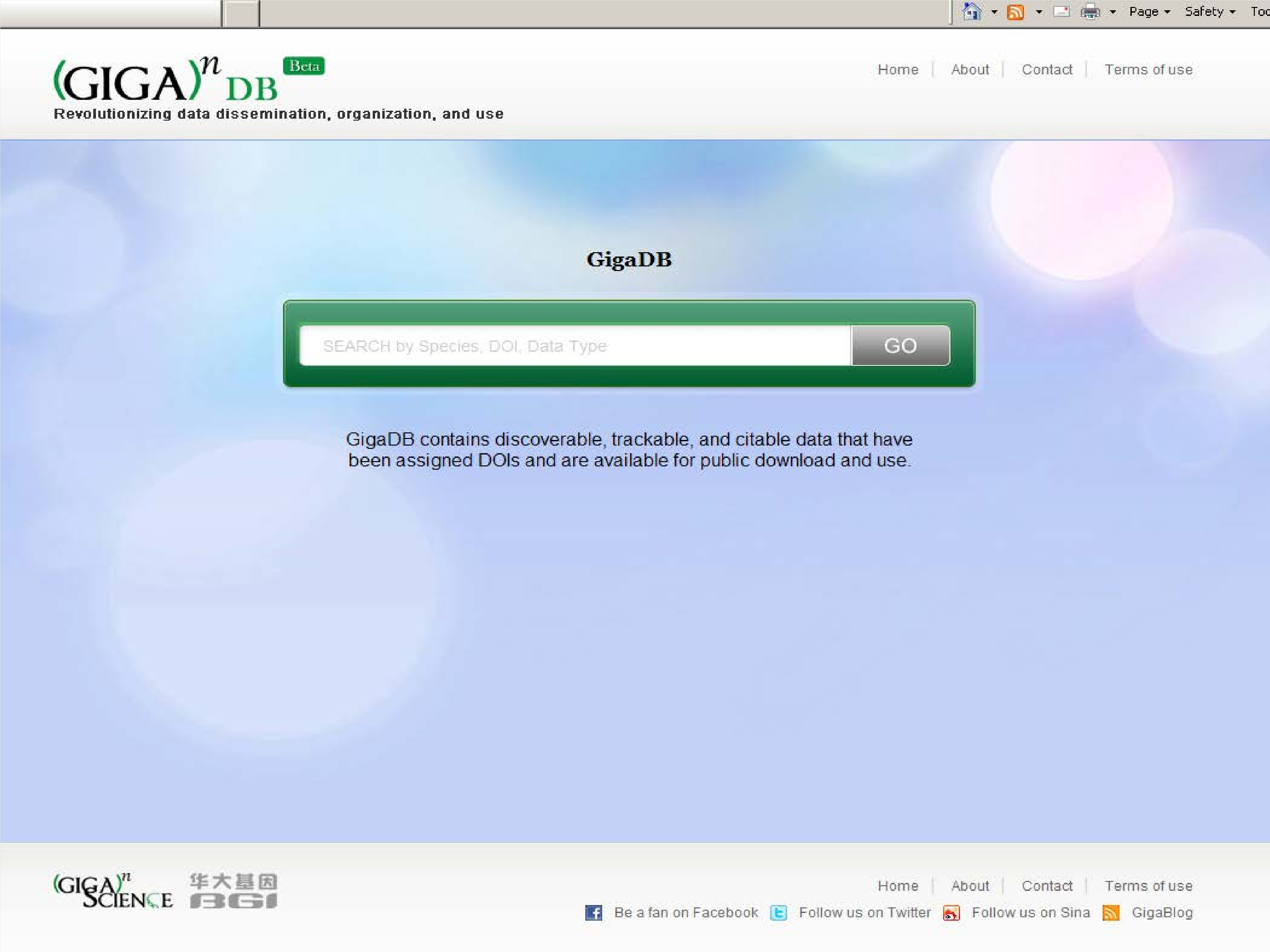

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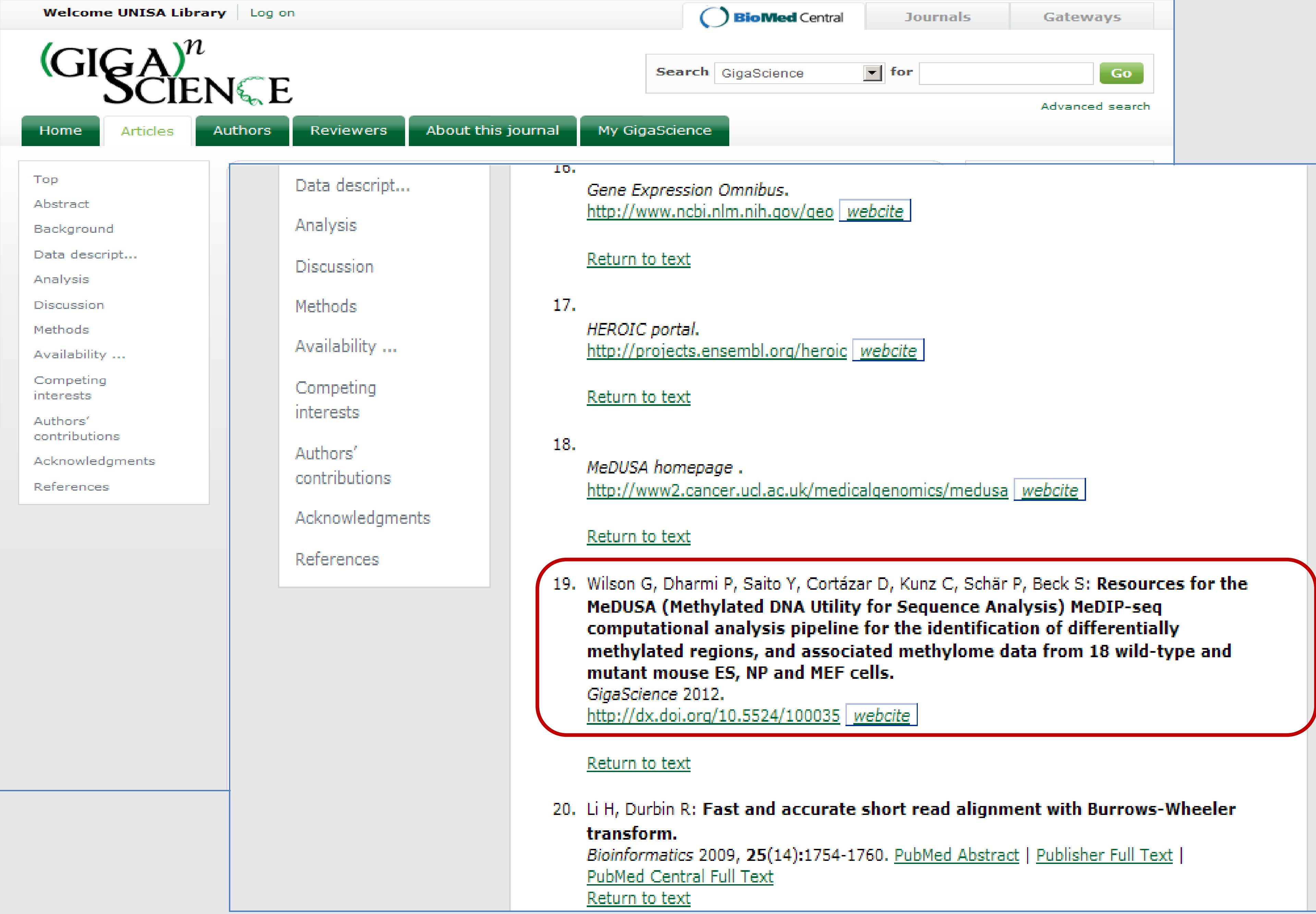

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19. Wilson G, Dharmi P, Saito Y, Cortázar D, Kunz C, Schär P, Beck S: **Resources for the MeDUSA (Methylated DNA Utility for Sequence Analysis) MeDIP-seq computational analysis pipeline for the identification of differentially methylated regions, and associated methylome data from 18 wild-type and mutant mouse ES, NP and MEF cells.**
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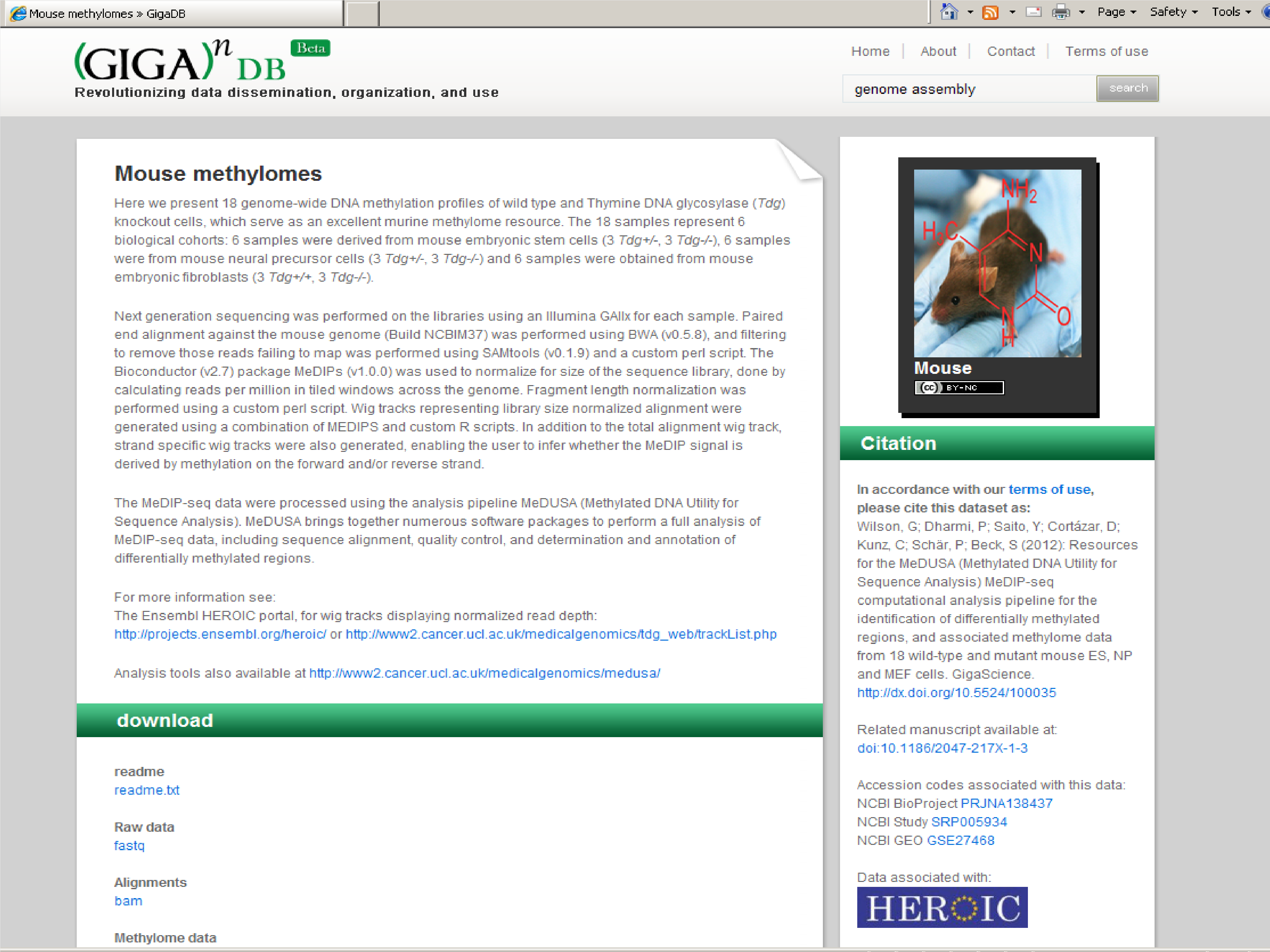

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Here we present 18 genome-wide DNA methylation profiles of wild type and Thymine DNA glycosylase (*Tdg*) knockout cells, which serve as an excellent murine methylome resource. The 18 samples represent 6 biological cohorts: 6 samples were derived from mouse embryonic stem cells (3 *Tdg+/-*, 3 *Tdg-/-*), 6 samples were from mouse neural precursor cells (3 *Tdg+/-*, 3 *Tdg-/-*) and 6 samples were obtained from mouse embryonic fibroblasts (3 *Tdg+/+*, 3 *Tdg-/-*).

Next generation sequencing was performed on the libraries using an Illumina GAIIx for each sample. Paired end alignment against the mouse genome (Build NCBIM37) was performed using BWA (v0.5.8), and filtering to remove those reads failing to map was performed using SAMtools (v0.1.9) and a custom perl script. The Bioconductor (v2.7) package MeDIPs (v1.0.0) was used to normalize for size of the sequence library, done by calculating reads per million in tiled windows across the genome. Fragment length normalization was performed using a custom perl script. Wig tracks representing library size normalized alignment were generated using a combination of MEDIPS and custom R scripts. In addition to the total alignment wig track, strand specific wig tracks were also generated, enabling the user to infer whether the MeDIP signal is derived by methylation on the forward and/or reverse strand.

The MeDIP-seq data were processed using the analysis pipeline MeDUSA (Methylated DNA Utility for Sequence Analysis). MeDUSA brings together numerous software packages to perform a full analysis of MeDIP-seq data, including sequence alignment, quality control, and determination and annotation of differentially methylated regions.

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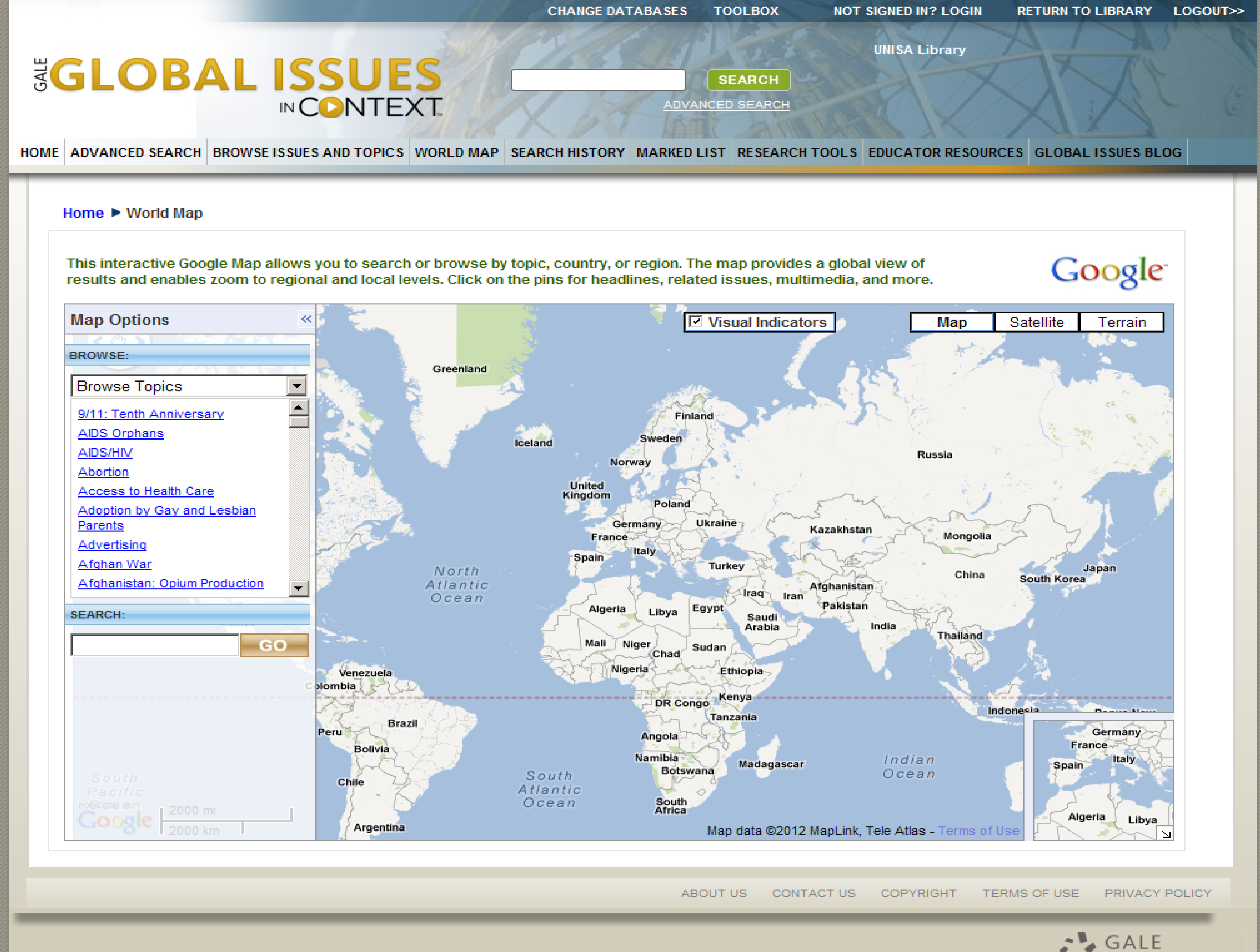

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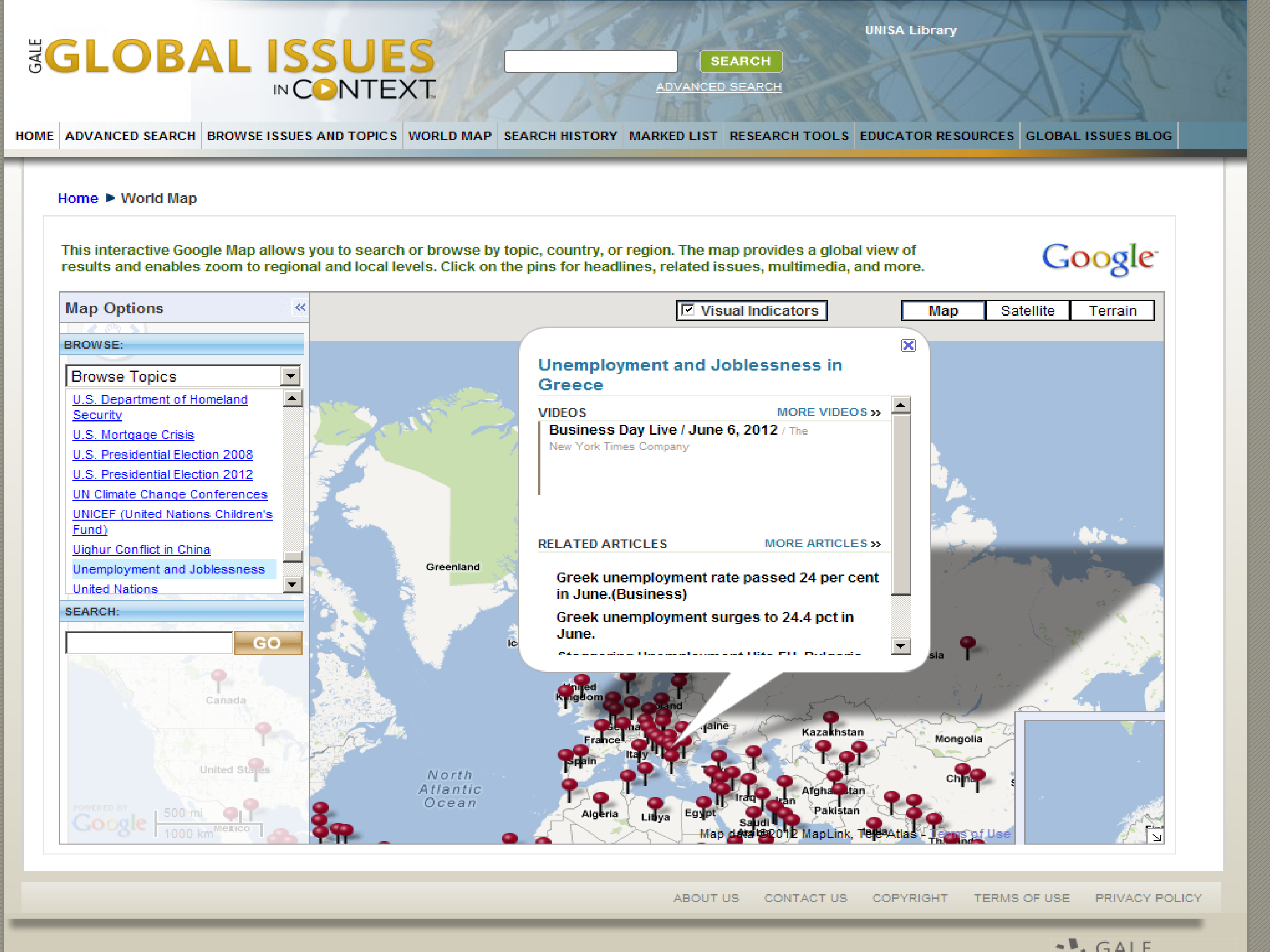

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U.S. Presidential Election 2012

OVERVIEW

The next U.S. presidential election will take place on 6 November 2012. The election process begins in February 2012 with the first state primary elections; these determine which candidates from the Democratic and Republican parties will face off against each other in the main election. Although President Barack Obama (1961–) will almost certainly be the Democratic candidate, no clear Republican front runner has yet emerged.

The 2012 election will be the first presidential election since the Supreme Court case *Citizens United v. Federal Election Commission*, decided in January 2010. In the *Citizens United* case, the court ruled that corporations could provide for unlimited funding of political broadcasts during election season. Previously, corporations and unions had been restricted from airing their own political ads before primary or general elections. Many critics argued that the ruling will give corporations an excessive amount of influence over the political process.

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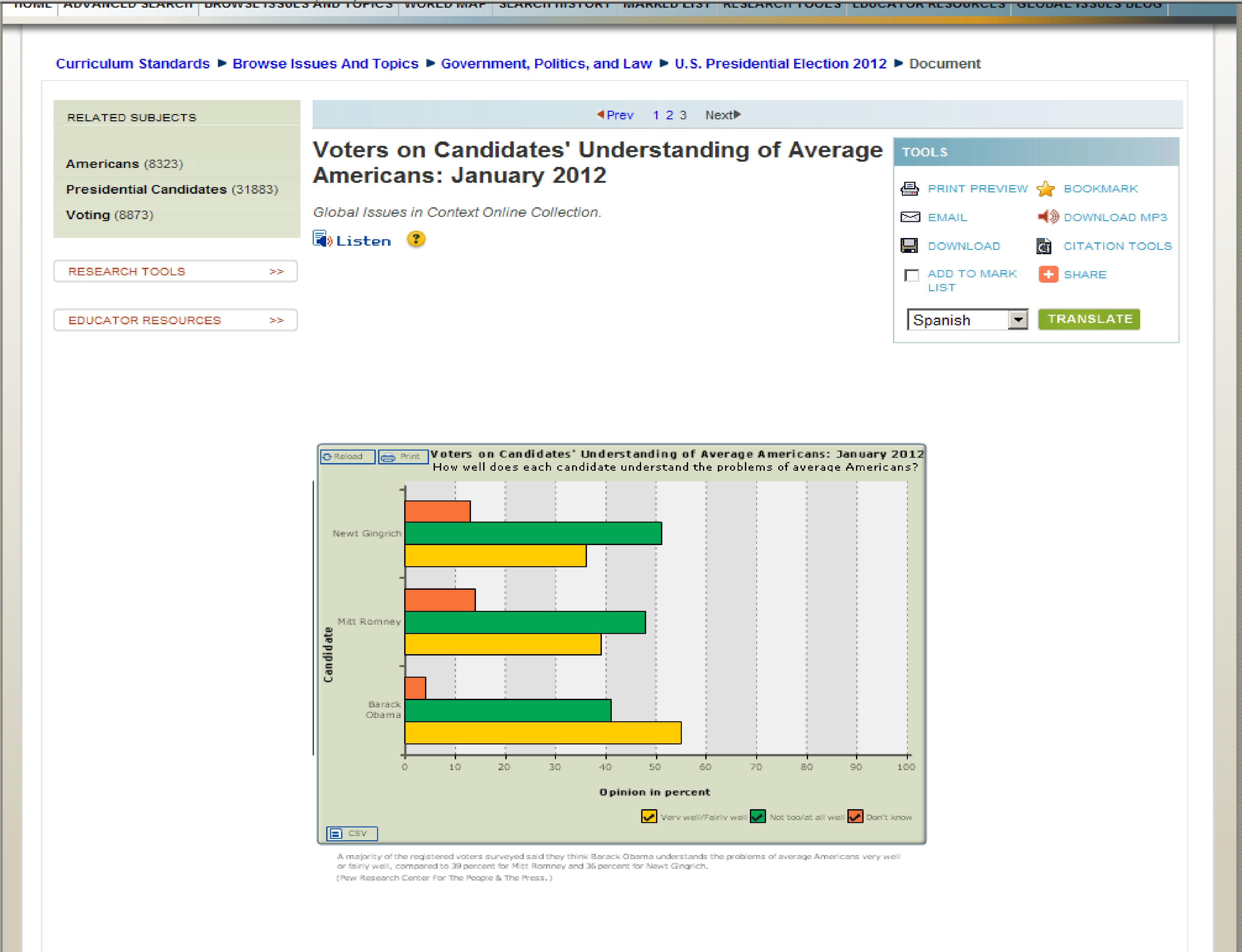

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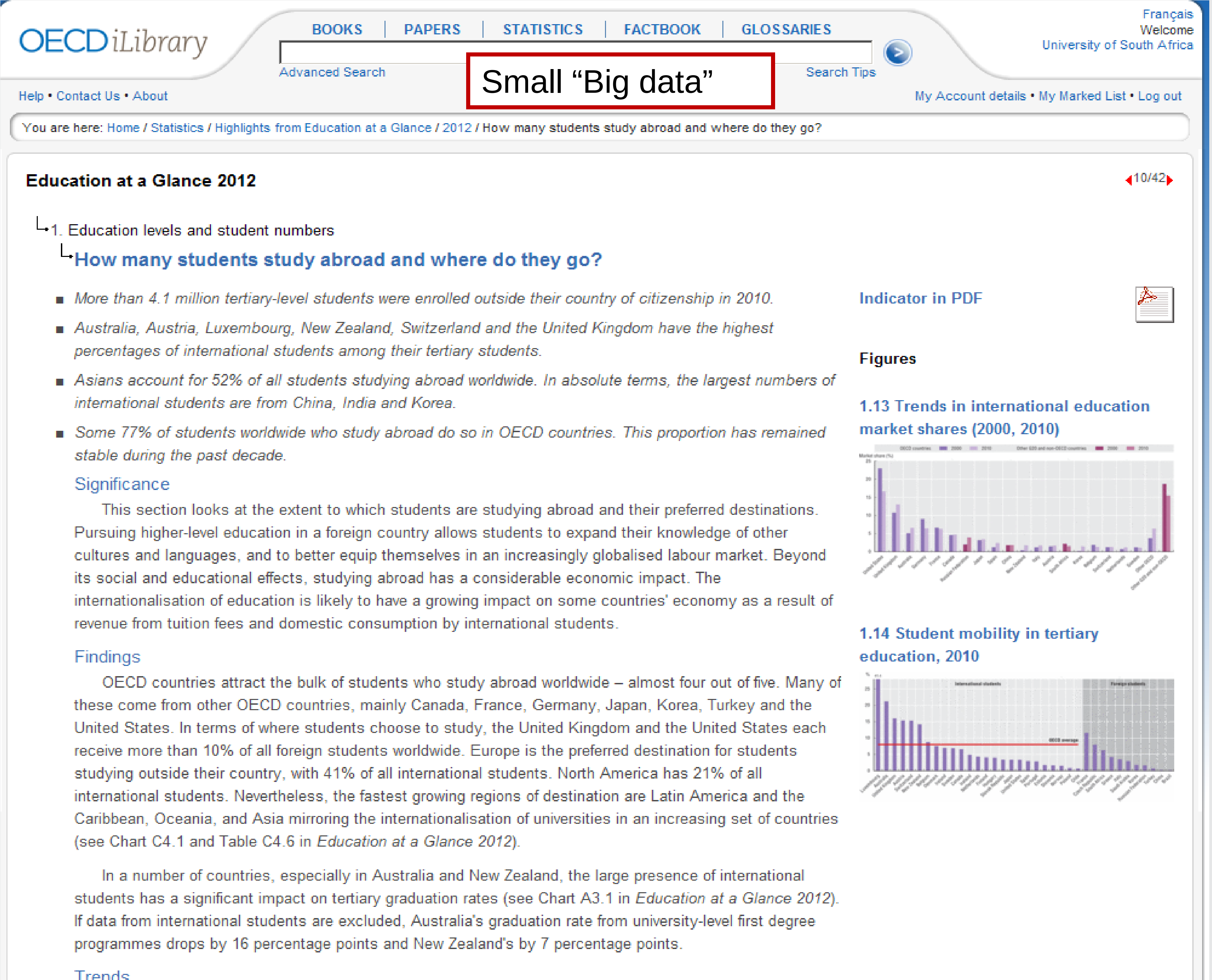

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Education at a Glance 2012

1. Education levels and student numbers

How many students study abroad and where do they go?

- *More than 4.1 million tertiary-level students were enrolled outside their country of citizenship in 2010.*
- *Australia, Austria, Luxembourg, New Zealand, Switzerland and the United Kingdom have the highest percentages of international students among their tertiary students.*
- *Asians account for 52% of all students studying abroad worldwide. In absolute terms, the largest numbers of international students are from China, India and Korea.*
- *Some 77% of students worldwide who study abroad do so in OECD countries. This proportion has remained stable during the past decade.*

Significance

This section looks at the extent to which students are studying abroad and their preferred destinations. Pursuing higher-level education in a foreign country allows students to expand their knowledge of other cultures and languages, and to better equip themselves in an increasingly globalised labour market. Beyond its social and educational effects, studying abroad has a considerable economic impact. The internationalisation of education is likely to have a growing impact on some countries' economy as a result of revenue from tuition fees and domestic consumption by international students.

Findings

OECD countries attract the bulk of students who study abroad worldwide – almost four out of five. Many of these come from other OECD countries, mainly Canada, France, Germany, Japan, Korea, Turkey and the United States. In terms of where students choose to study, the United Kingdom and the United States each receive more than 10% of all foreign students worldwide. Europe is the preferred destination for students studying outside their country, with 41% of all international students. North America has 21% of all international students. Nevertheless, the fastest growing regions of destination are Latin America and the Caribbean, Oceania, and Asia mirroring the internationalisation of universities in an increasing set of countries (see Chart C4.1 and Table C4.6 in *Education at a Glance 2012*).

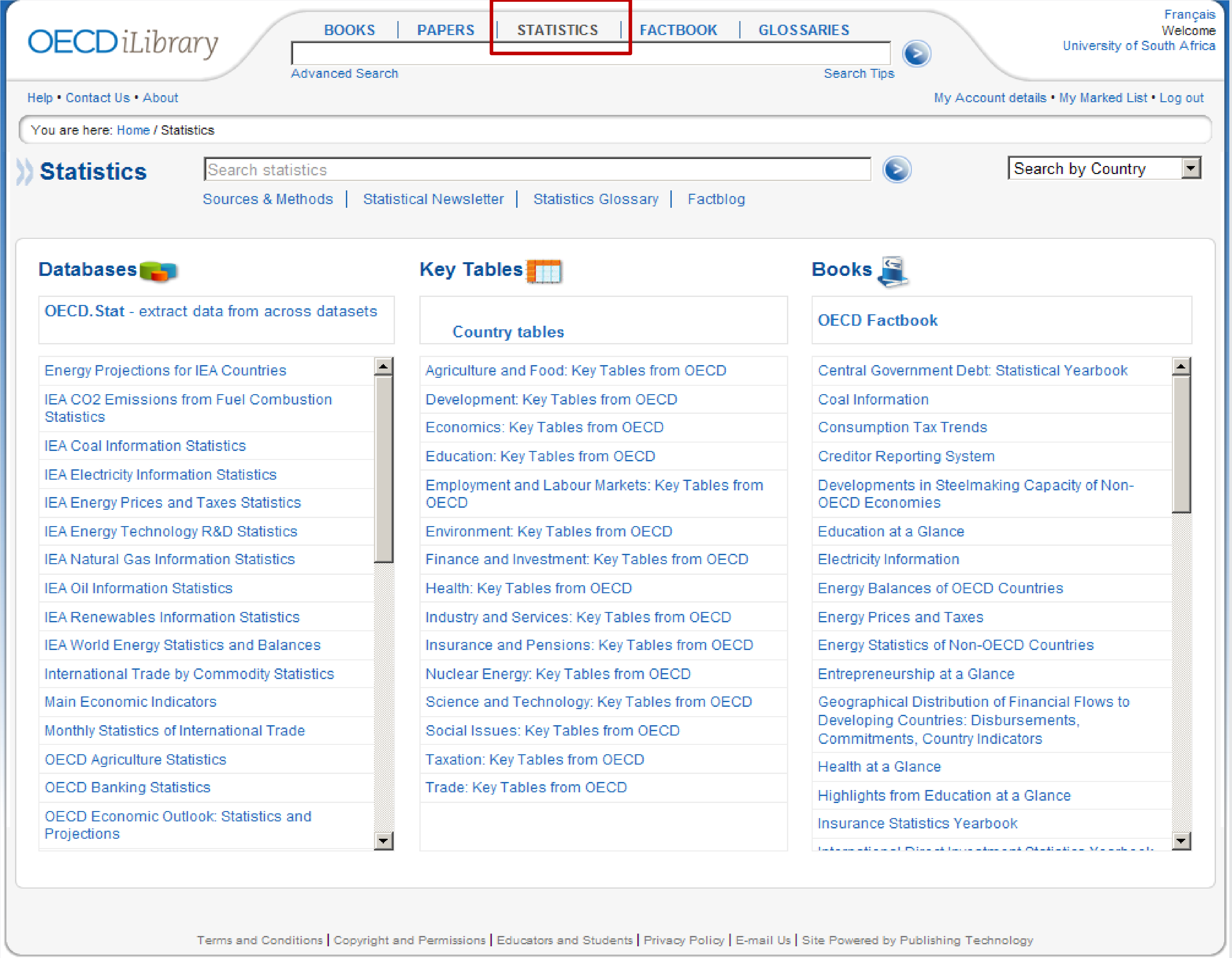
In a number of countries, especially in Australia and New Zealand, the large presence of international students has a significant impact on tertiary graduation rates (see Chart A3.1 in *Education at a Glance 2012*). If data from international students are excluded, Australia's graduation rate from university-level first degree programmes drops by 16 percentage points and New Zealand's by 7 percentage points.

Trends

Figures

1.13 Trends in international education market shares (2000, 2010)

1.14 Student mobility in tertiary education, 2010



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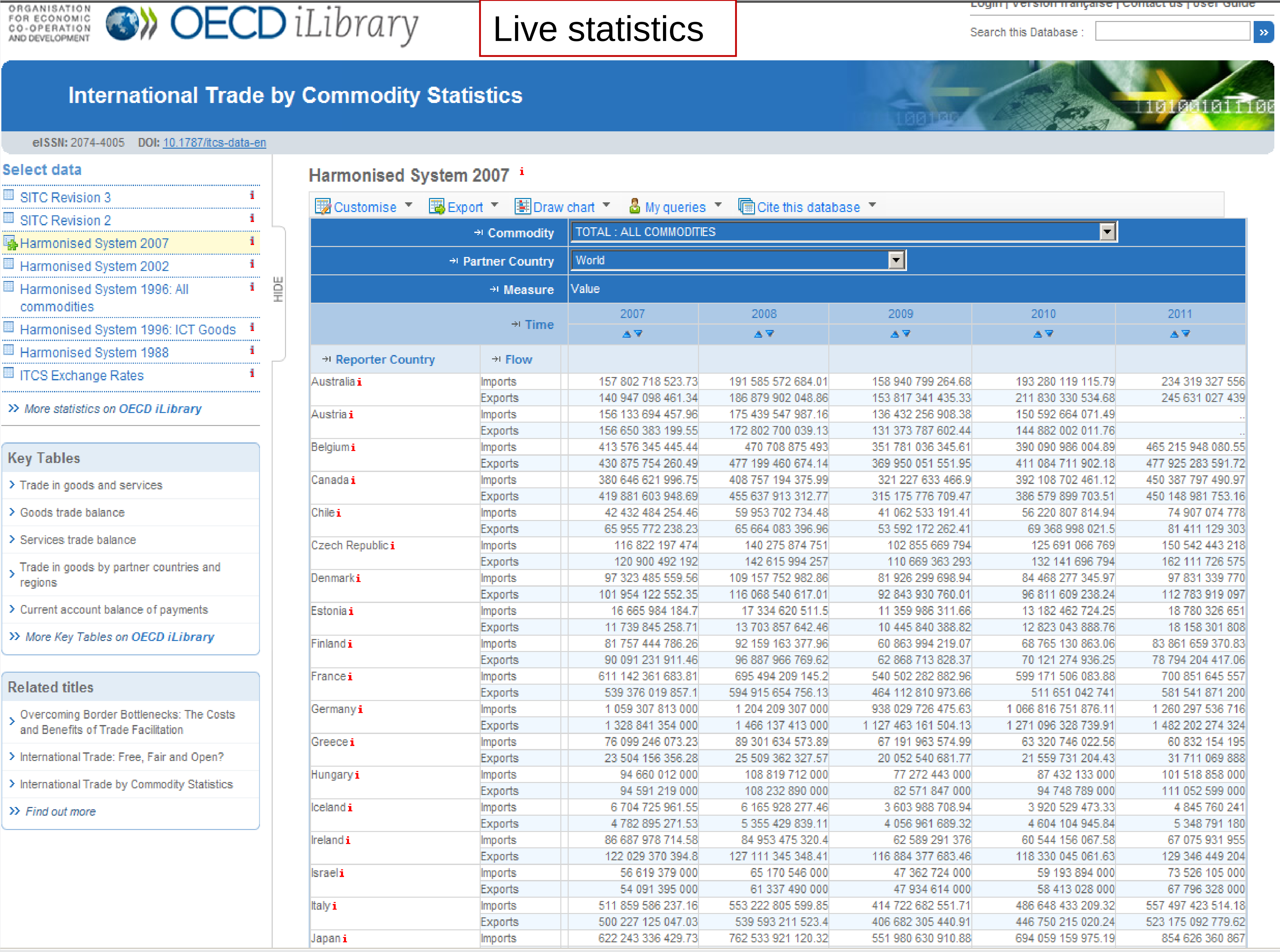

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	Exports	140 947 098 461.34	186 879 902 048.86	153 817 341 435.33	211 830 330 534.68	245 631 027 439
Austria	Imports	156 133 694 457.96	175 439 547 987.16	136 432 256 908.38	150 592 664 071.49	..
	Exports	156 650 383 199.55	172 802 700 039.13	131 373 787 602.44	144 882 002 011.76	..
Belgium	Imports	413 576 345 445.44	470 708 875 493	351 781 036 345.61	390 090 986 004.89	465 215 948 080.55
	Exports	430 875 754 260.49	477 199 460 674.14	369 950 051 551.95	411 084 711 902.18	477 925 283 591.72
Canada	Imports	380 646 621 996.75	408 757 194 375.99	321 227 633 466.9	392 108 702 461.12	450 387 797 490.97
	Exports	419 881 603 948.69	455 637 913 312.77	315 175 776 709.47	386 579 899 703.51	450 148 981 753.16
Chile	Imports	42 432 484 254.46	59 953 702 734.48	41 062 533 191.41	56 220 807 814.94	74 907 074 778
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Czech Republic	Imports	116 822 197 474	140 275 874 751	102 855 669 794	125 691 066 769	150 542 443 218
	Exports	120 900 492 192	142 615 994 257	110 669 363 293	132 141 696 794	162 111 726 575
Denmark	Imports	97 323 485 559.56	109 157 752 982.86	81 926 299 698.94	84 468 277 345.97	97 831 339 770
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Estonia	Imports	16 665 984 184.7	17 334 620 511.5	11 359 986 311.66	13 182 462 724.25	18 780 326 651
	Exports	11 739 845 258.71	13 703 857 642.46	10 445 840 388.82	12 823 043 888.76	18 158 301 808
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	Exports	90 091 231 911.46	96 887 966 769.62	62 868 713 828.37	70 121 274 936.25	78 794 204 417.06
France	Imports	611 142 361 683.81	695 494 209 145.2	540 502 282 882.96	599 171 506 083.88	700 851 645 557
	Exports	539 376 019 857.1	594 915 654 756.13	464 112 810 973.66	511 651 042 741	581 541 871 200
Germany	Imports	1 059 307 813 000	1 204 209 307 000	938 029 726 475.63	1 066 816 751 876.11	1 260 297 536 716
	Exports	1 328 841 354 000	1 466 137 413 000	1 127 463 161 504.13	1 271 096 328 739.91	1 482 202 274 324
Greece	Imports	76 099 246 073.23	89 301 634 573.89	67 191 963 574.99	63 320 746 022.56	60 832 154 195
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Hungary	Imports	94 660 012 000	108 819 712 000	77 272 443 000	87 432 133 000	101 518 858 000
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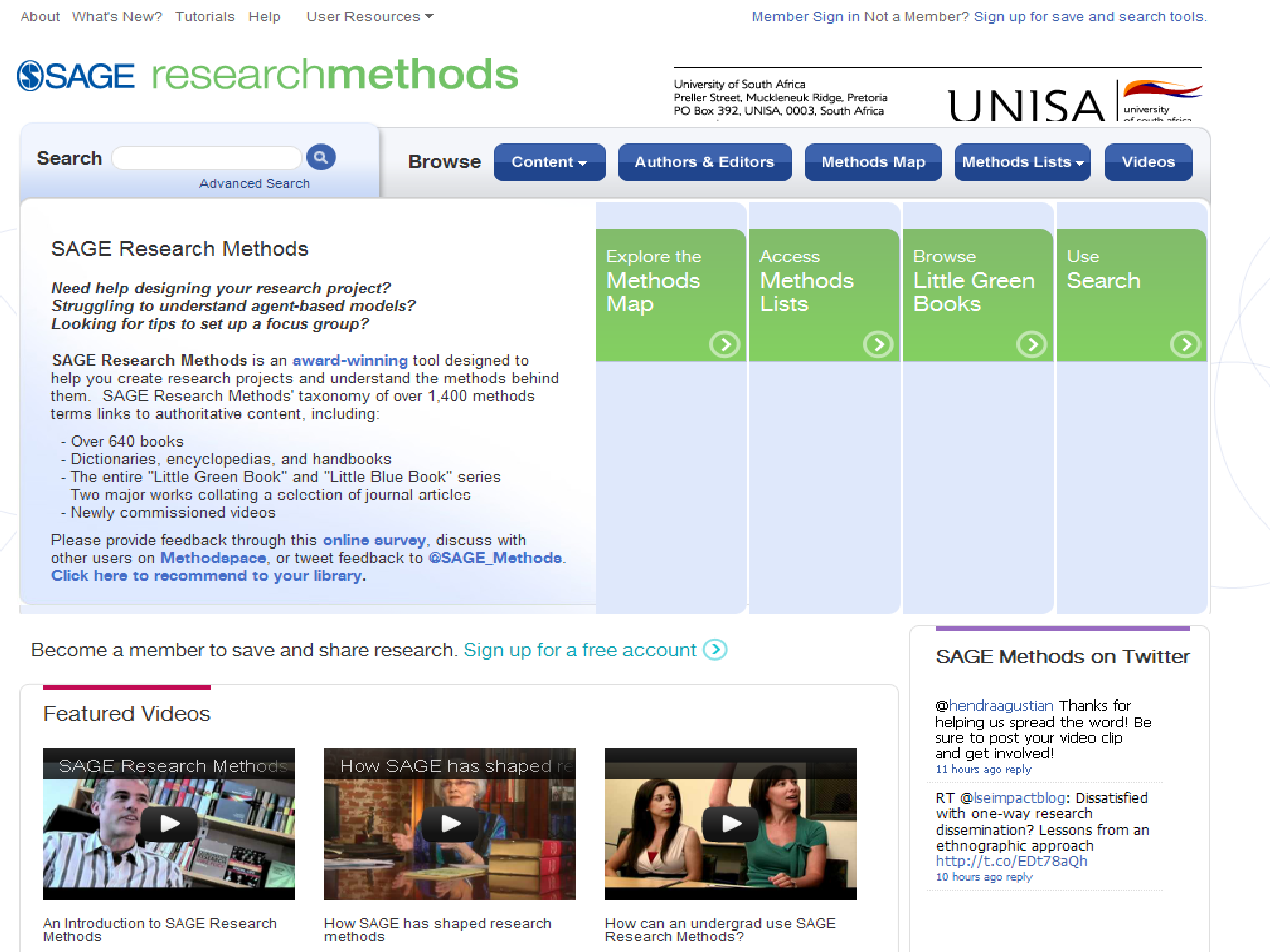
	Exports	4 782 895 271.53	5 355 429 839.11	4 056 961 689.32	4 604 104 945.84	5 348 791 180
Ireland	Imports	86 687 978 714.58	84 953 475 320.4	62 589 291 376	60 544 156 067.58	67 075 931 955
	Exports	122 029 370 394.8	127 111 345 348.41	116 884 377 683.46	118 330 045 061.63	129 346 449 204
Israel	Imports	56 619 379 000	65 170 546 000	47 362 724 000	59 193 894 000	73 526 105 000
	Exports	54 091 395 000	61 337 490 000	47 934 614 000	58 413 028 000	67 796 328 000
Italy	Imports	511 859 586 237.16	553 222 805 599.85	414 722 682 551.71	486 648 433 209.32	557 497 423 514.18
	Exports	500 227 125 047.03	539 593 211 523.4	406 682 305 440.91	446 750 215 020.24	523 175 092 779.62
Japan	Imports	622 243 336 429.73	762 533 921 120.32	551 980 630 910.88	694 059 159 975.19	854 626 360 867



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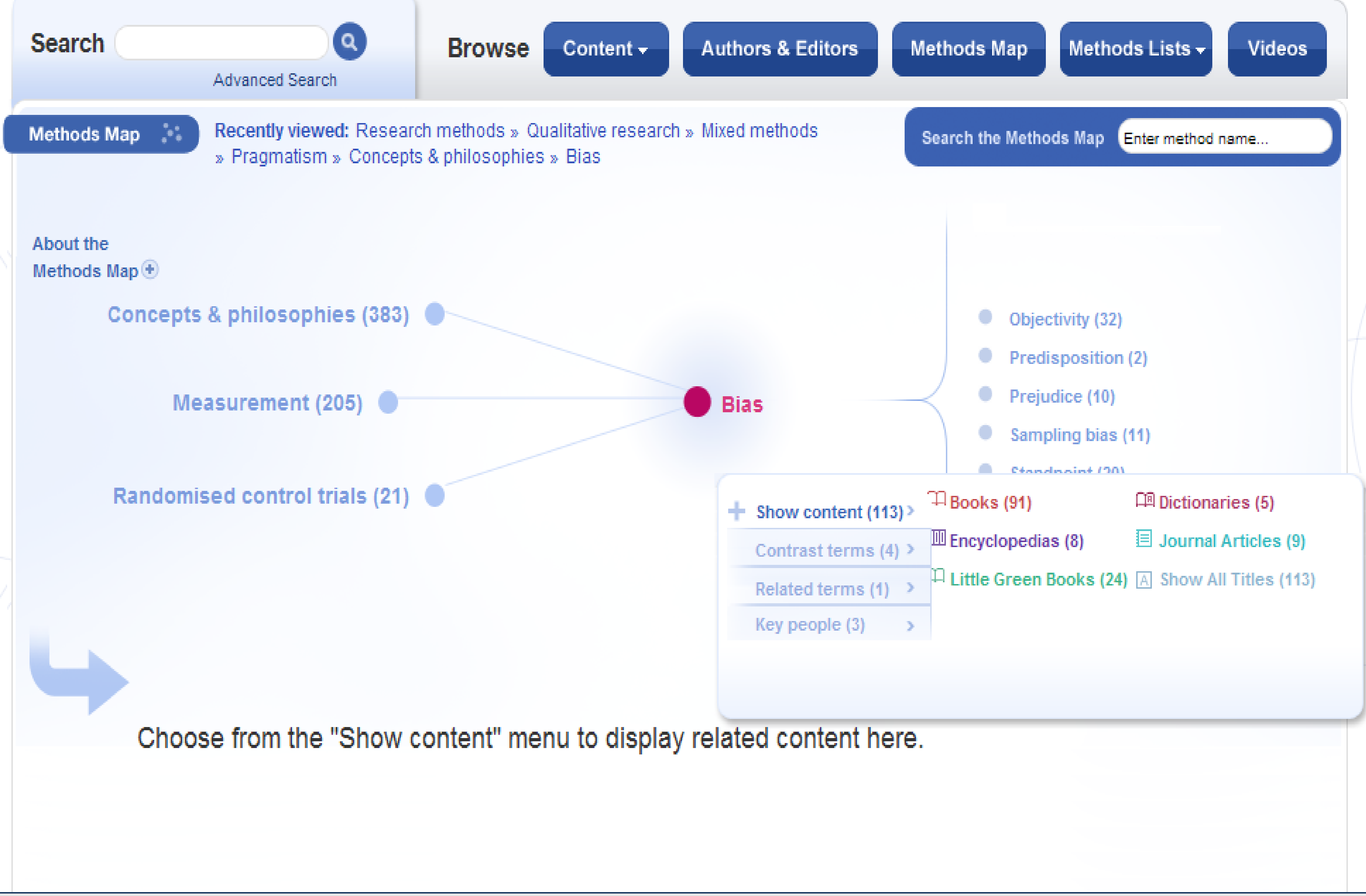

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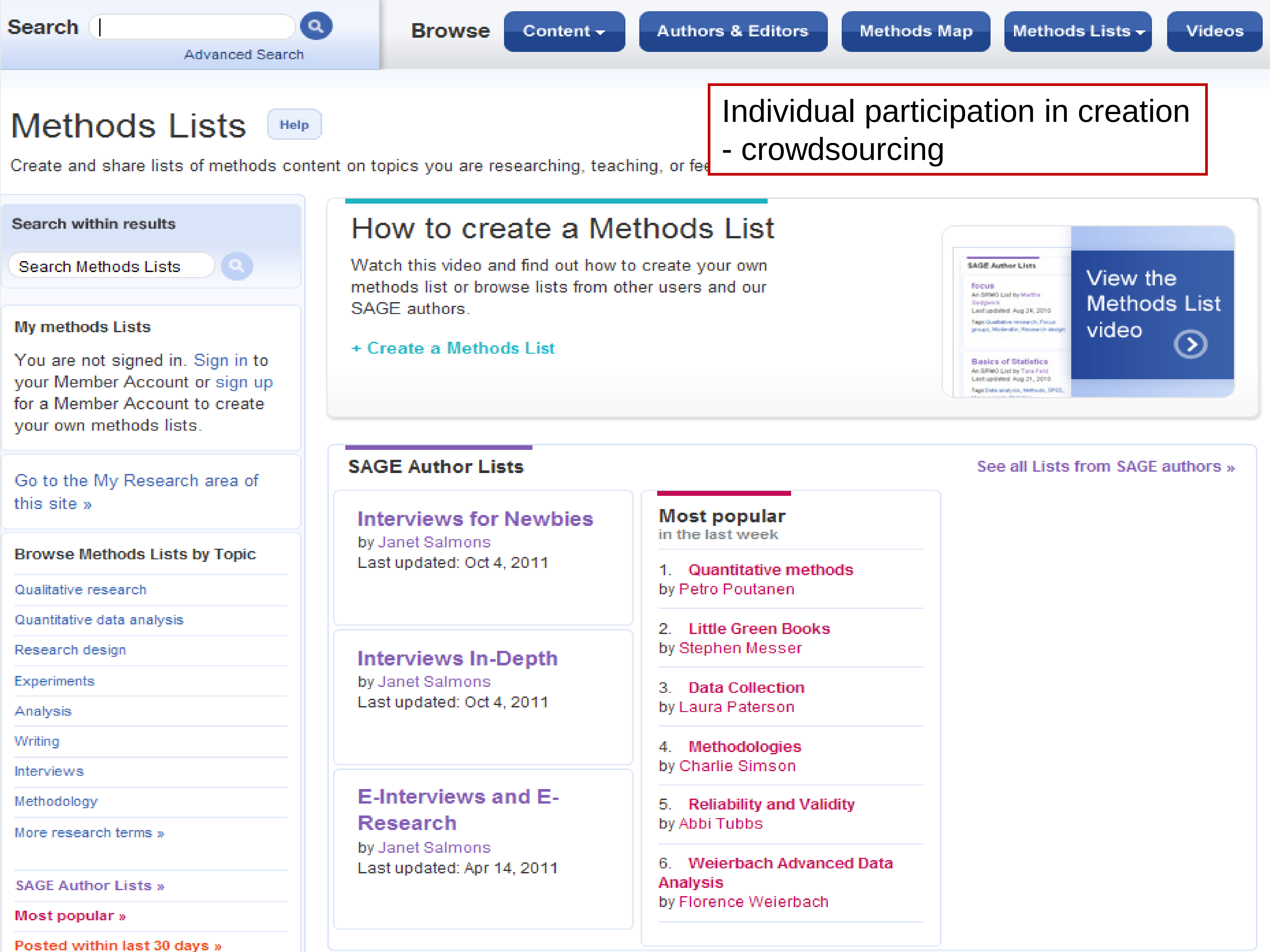

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