

**Alternatives for STM Publishing in  
the Internet Age –  
A Personal View**

ConCERT 2004

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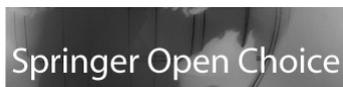
## Alternatives for STM Publishing in the internet age- a personal view

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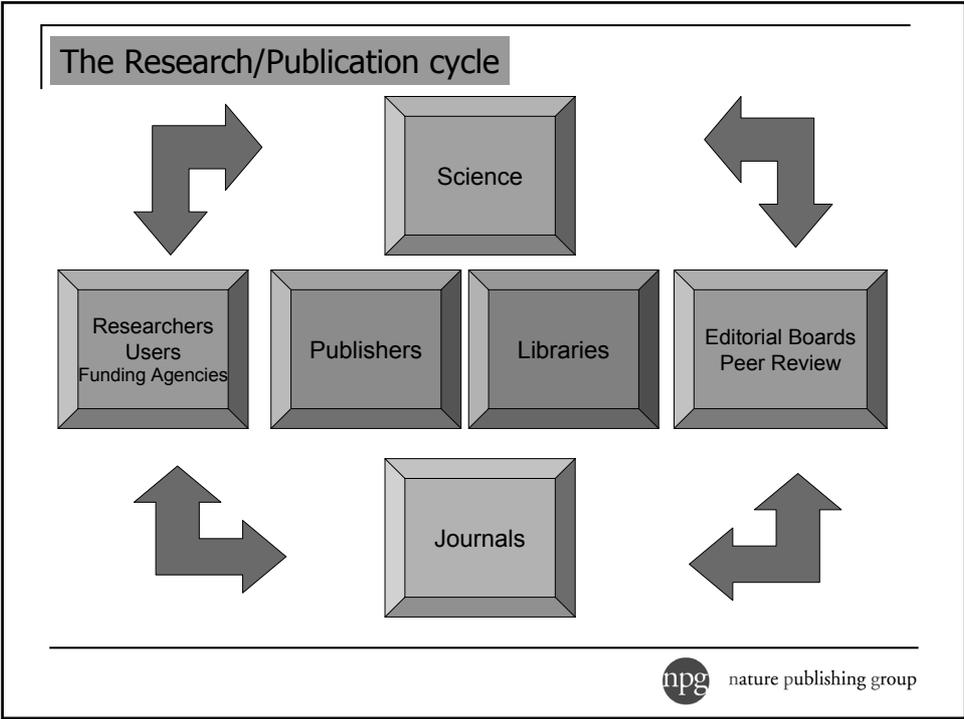


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Are there viable alternatives to “reader pays” publishing?



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### The role of the Publisher is to add value to the process

Publishers

Publishers can be

- Commercial publishers
- Academic Societies
- Governments
- Non-profit groups
- Librarians

Publishers add value to the publishing cycle by providing

<p>High editorial standards and quality Assist the Peer review process Review the existing research Unrestricted Access</p>	<p>Fast publishing Niche publishing</p>	<p>Searching and linking Aggregation of content New content &amp; services Online Tools Ease of Access: anywhere/anytime Continuous publication</p>
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## Who pays?

As Publishers add value, somebody has to pay for it. Here are some of the models.

- Reader pays (Centralized purchasing- the traditional model)
- Author pays (non-profit, or for profit): Open Access
- Advertisers or Sponsors pay.

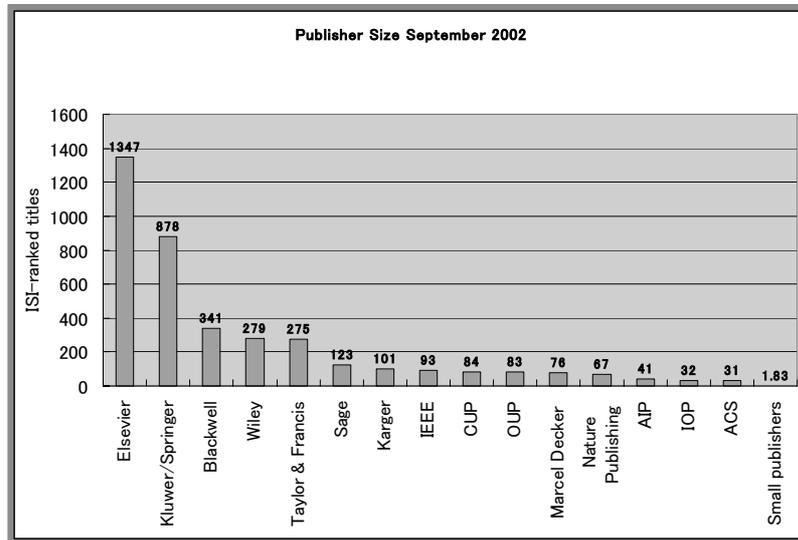
## Reader Pays- centralized purchasing

Centralized Purchasing by libraries and consortia through direct deals with publishers favours larger publishers who can offer large portfolios. While this seems like a good deal it raises many issues.

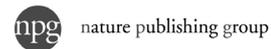
- Is quantity a substitute for quality
- Librarians rely on usage to measure value (COUNTER project) but access promotes usage
- Is single title purchasing viable? If not, what are the consequences for niche titles and new titles?
- What is the accepted unit of information? The document, the journal or the database?
- What does the current marketplace mean for small publishers and local publishers?



The top 5 publishers account for 37% of titles and 44% of articles



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Author Pays- The Open access Debate

What is Open Access?

There is considerable debate on how far the definition goes:

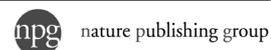
On December 1-2, 2001, the Open Society Institute (OSI) called a meeting in Budapest of leading proponents of open access for scientific and scholarly journal literature. They drafted the Budapest Open Access Initiative.

The BOAI definition of Open Access is:

“The right of users to read, download, copy, distribute, print, search or link to the full text of articles’ free of charge.”

In October 2003, The Max Planck Society drafted the “Berlin Declaration”. This defines Open Access as

“Free...(online, full text) access. A complete version of the (Open Access work)...is deposited...in at least one online repository...to enable Open Access, unrestricted distribution, interoperability and long-term archiving.”



## Author Pays- The Open access Debate



The Open Access movement can be compared to the Open Source movement.

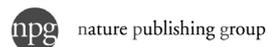
The Open Source movement, to make software available under license free of charge, was a reaction to the dominant position of Microsoft in the industry and high pricing in the software market.

The Open Source movement calls for programmers to distribute their software freely on the web, under a license that protects their intellectual property rights.

So far this has had little impact on the large players in the industry that have well established brands, quality products, or unique products. The biggest effect has been on smaller players as Open Source provides a low cost alternative to new offerings by these companies.

Governments have been supportive of the Open Source movement.

Open Source has created new opportunities for large players who have created new businesses supporting Open Source.



## Author Pays- How widespread is Open Access now?

Open Access Publishers:

BioMed Central (BMC):

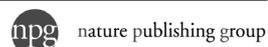
BioMed Central is an independent commercial publisher committed to providing immediate free-access to peer-reviewed biomedical and clinical journals. All the original research articles in journals published by BMC are immediately and permanently available online without charge, or any other barriers to access. It publishes more than 100 peer-reviewed Open Access journals in Biology and Medicine.



BMC charges authors \$500 per paper published (although waivers are available for those who cannot afford these charges). The article processing fee is charged when an article is accepted.

BMC also offers institutional "memberships" allowing paying institutions to waive author fees. These institutional "memberships" are in the order of tens of thousands of dollars.

In 2003 BMC had around 2,700 submissions with a rejection rate of 40-50%.



## Author Pays- How widespread is Open Access now?

Open Access Publishers:



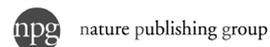
### Public Library of Science (PLOS)

The Public Library of Science (PLOS) is a non-profit organisation of scientists and physicians committed to making the world's scientific and medical literature a public resource. All material published by PLOS is published under an Open Access license that allows unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. It launched its first title PLOS Biology in 2003.

PLOS received a \$9m grant from the Gordon & Betty Moore Foundation and other financial support from the Irving A Hansen Memorial Foundation and several private citizens.

PLOS charges its authors \$1,500 per paper.

PLOS is considering launching a cluster of less prestigious journals to increase revenue and spread costs.



## Author Pays- How widespread is Open Access now?

Open Access Publishers:

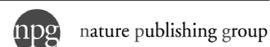
### Oxford University Press

Oxford University Press (OUP) conducted an experiment aimed at moving one of its biochemical journals, Nucleic Acids Research (NAR), gradually to an Open Access model. OUP offered a service to authors whereby all articles in the Annual Database Issue published in January 2004 would be published under an Open Access model if authors agreed to pay a 300 GBP (\$540) charge. The experiment was considered a success with 90% of authors agreeing to pay the charge. OUP announced in June that NAR would move to a full Open Access model in 2005. Author charges will be between \$500 and \$1500, and institutional memberships are \$2459.

### Proceedings of the National Academy of Sciences USA (PNAS)

Proceedings of the National Academy of Sciences USA (PNAS) has begun an Open Access (OA) option, whereby authors may pay a surcharge of US\$1,000 to make their paper freely available on the PNAS and PubMed Central (PMC) websites immediately upon publication.

A recent poll of 210 PNAS authors indicated that half of them would be willing to pay the surcharge.



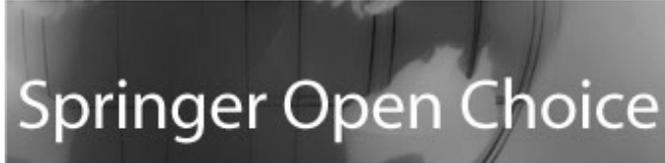
## Author Pays- How widespread is Open Access now?

Open Access Publishers:

### Springer Open Choice

Springer Open Choice allows Authors to pay a surcharge of \$3000 on publication which allows the work to be permanently archived and freely available via SpringerLink to anyone, anywhere in the world for viewing, full-text searching, and downloading.

This charge does not replace any existing charges and authors "purchase" the Open Choice option once a paper is accepted.

The logo for Springer Open Choice features the text "Springer Open Choice" in a white, sans-serif font, centered over a dark, semi-transparent rectangular background. The background image is a grayscale photograph of a globe, showing the continents and oceans.

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## Author Pays- Is it good value?

Open Access Cost Comparison:

BioMed Central: \$500  
Public Library of Science: \$1500

PNAS: \$1,000  
Oxford university Press (NAR): \$1500 (non-member institution)  
Springer Open Choice: \$3000

Cost of a Nature Personal subscription: \$159  
Cost of a Nature Institutional Subscription (2004): \$1280  
Cost of a Nature Online Site license: \$3500 for a Small University, \$6,200 for a large University.

The cost of submitting two papers using Springer Open Choice is almost enough to provide online access to "Nature" for a large university for one year.

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## Author Pays- Open Access: Is it good value?

Open Access Cost Comparison:

It could cost U.S. funders of science up to or more than one billion dollars to publish all U.S. authored papers in Open Access journals under the author-pays model (using an average cost of \$2,500 per paper in 2003).

In 2000- 2001, American Research Libraries (ARL) in the U.S. and Canada spent \$550m on serials subscriptions. Library spending in the US is increasing at an average rate less than the average increase in journal pricing.

Most Open Access publishers admit that author charges alone are not enough to support the costs of journal publishing and some kind of combined model is required and that institutional “memberships” are required. These “memberships” are priced at the same level as journal subscriptions.

## Author Pays- Open Access: Will it survive?

It is currently too early to give a proper assessment on the viability of the Open Access business model.

Most Open Access publishers are struggling to overcome many of the limitations faced by any publisher launching new journals. Authors are reluctant to submit their best papers to an untried journal where readership (although freely available) may be limited by perceptions that the journal is not publishing the best research. The reluctance to publish is not about the business model, but about the perceived value of the journals.

Unless Open Access publishers are willing to charge very high publishing charges, the Open Access model will always be a much lower margin business than subscription based publishing. This makes it harder for new Open Access publishers to succeed.

## Author Pays- Open Access: Will it survive?

Although some early studies have shown that increased access leads to increased citations, this is not necessarily the case for all Open Access journals. As more papers are made available by Open Access, it is likely citations will reduce to their previous levels. (Although the number of papers published over the last ten years has increased greatly, the number of citations has stayed about the same).

## Author Pays- Open Access: Winners and Losers

### Publishers:

#### Winners:

The most likely scenario for success is the Open Choice (Springer) model where an established publisher introduces an "Open Access option" into a publication predominantly supported by subscription fees. The initial benefits of this are mainly PR related, but if governments and funding agencies start to actively support the Open Access movement, this may give these publishers a commercial advantage.

Very small publishers and non-profit publishers can also benefit by lowering their costs and reducing the value added to their products.

#### Losers:

Open Access only publishers are likely to struggle to establish their brands in the marketplace with limited funds to add value in other ways. Some high profile titles (PLoS Biology) may survive but many smaller journals will fail for the reasons many new journals fail (lack of support from authors).

Small to mid-size publishers (including societies) who rely on subscription revenues and cannot afford to operate on lower profit margins, may be hurt as Open Access journals may provide a low-cost alternative to their titles.

## Author Pays- Open Access: Winners and Losers

Users:

Winners:

Any group that uses more research than they publish.

This includes:

Big Pharma and Industry in general:

Third World countries

Losers:

Any group that publishes more research than they use.

This mainly includes large institutions and funding agencies in the developed world which have been active supporters of the Open Access movement.

## Author Pays- Open Access: a funnel for scientific growth?

The number of research papers published in the last 15 years has increased significantly, doubling in some subject areas like genetics and molecular biology. However, the increase in number of times a paper is cited has not risen in line with the increased output.

As Open access is “author-driven” rather than “subscription driven” it may succeed in an environment where large numbers of Archive-only papers are published. The Open Access model actively promotes quantity, rather than quality.

As increasing the rejection rate of an Open Access journal will increase the cost of the publication charge\*, there is a danger that quality will be compromised.

\* If a journal charges \$2,500 per manuscript and has a 50% rejection rate, the same journal publishing the same number of papers would have to charge \$12,500 per manuscript if it raised its rejection rate to 90%.

## Author Pays- Open Access: Its all about the brand

Ultimately, authors will still select journals that they wish to publish in by the perceived value of the journal to them, and users will still access journals (whether they are free, or purchased by their institution) by the perceived value to their research.

The freedom of authors to select the journal that they wish to publish in is paramount in the scientific community.

Open Access is likely to be perceived as just one more added value that a publisher can add to their products, and this added value has a cost attached to it, just like other values such as speed of publication. Having your paper freely available may not be perceived to have a great value if the journal that makes it available is not perceived to be a quality product.

A Journal, and the quality that its brand represents, is greater than the sum of the articles contained in the Journal. It is that quality that determines whether authors wish to submit to the journal and keep it financially viable, no matter what business model is used.

## Advertising Pays

Can advertising or sponsorship revenue support academic journals as it does newspapers and other forms of publishing?

Some print journals, such as Nature and Science, have been successful at attracting advertising revenue as well as subscription revenue. Journals that serve the pharmaceutical industry and many journals in clinical medicine are entirely supported by sponsorship and advertising.

However, web advertising has yet to replace print advertising in terms of revenue, and e-journals actively threaten advertising revenues of their print counterparts.

Will we see e-journals or database products entirely supported by Advertisers or sponsors?


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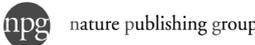
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letters to nature

**Figure 2** Responses to implied motion in a single cell. **a**, Raster and peri-stimulus time histogram for responses to a Glass pattern with a 4° shift, a noise pattern, and clockwise (CW) and anticlockwise (ACW) rotation. **b**, Average firing rates in the stimulation period indicated by the grey area in **a**. The numbers on the ordinate refer to the Glass shift in degrees.

We have found a neural correlate of the global implied motion percept in the dorsal stream of the macaque visual cortex. While the monkeys fixated the centre of a screen, we recorded from cells in the medial (MT) and medial superior (MST) temporal areas of the superior temporal sulcus. We presented sequences of rotational Glass patterns (see Methods) with a varying amount of Glass shift. Humans perceived the patterns with the smallest and largest shift as random noise; only the patterns in the centre of the tested range

**Figure 4** Interactions between real and implied motion in a single cell. **a**, Polar direction tuning plot for a random dot pattern on a circular pathway. Dots represent single spikes recorded while the pattern moved in that direction, corrected for the latency of the cell. The solid grey curve represents the mean firing rate (the full radius represents 125 Hz in all polar plots, the arrow the preferred direction). **b**, Direction tuning for a combination of circular pathway motion with a Glass pattern oriented along the axis indicated above the plots. **c**, Direction tuning for circular pathway motion combined with translational motion in the direction indicated above the plots.

motion, we determined whether a cell's preference for expanding or rotating flow patterns predicted its preference for expansion or rotational Glass patterns. The trend ( $P = 0.055$ ) that 20 out of 32 cells thus tested preferred the same type of motion in the real

Figure 2

Figure 4

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# Complete atomic model of the bacterial flagellar filament by electron cryomicroscopy

Koji Yonekura<sup>1,2,3\*</sup>, Saori Maki-Yonekura<sup>1,3\*</sup> & Keiichi Namba<sup>1,2,3</sup>

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<sup>2</sup>Graduate School of Frontier Biosciences, Osaka University, and  
<sup>3</sup>Dynamic NanoMachine Project, ICORP, JST, 3-4 Hikaridai, Seika, Kyoto 619-0237, Japan

\*These authors contributed equally to this work

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The bacterial flagellar filament is a helical propeller for bacterial locomotion. It is a helical assembly of a single protein, flagellin, and its tubular structure is formed by 11 protofilaments in two distinct conformations, L- and R-type, for supercoiling. The X-ray crystal structure of a flagellin fragment lacking about 100 terminal residues revealed the protofilament structure, but the full filament structure is still essential for understanding the mechanism of supercoiling and polymerization. Here we report a complete atomic model of the R-type filament by electron cryomicroscopy. A density map obtained from image data up to 4 Å resolution shows the feature of  $\alpha$ -helical backbone and some large side chains. The atomic model built on the map reveals intricate molecular packing and an  $\alpha$ -helical coiled coil formed by the terminal chains in the inner core of the filament, with its intersubunit hydrophobic interactions having an important role in stabilizing the filament.

Bacteria swim by rotating helical flagellar filaments, which grow as long as 15  $\mu\text{m}$ , but the diameter is only 120–250 Å. The rotary motor at the base of the filament drives the rotation of this helical propeller<sup>1,2</sup> at hundreds of revolutions per second<sup>3,4</sup>. For chemotaxis and thermotaxis, the swimming pattern of bacteria such as *Salmonella* and *Escherichia coli* alternates between 'run' and 'tumble'; a run lasts for a few seconds and a tumble for a fraction of second. During a structure consisting of the F41 subunit, which is composed of three domains, D1, D2 and D3. Domain D1 forms the outer core of the filament and domains D2 and D3 form the projection on the filament surface. Simulated extension of the R-type protofilament model showed a small but significant conformational change of the  $\beta$ -hairpin in domain D1, which covers most of the axial molecular interface in the F41 protofilament, and it was interpreted as the

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## Advertising only models have rarely worked in Online Publishing

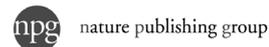
In 1990 Britannica's main product was the 32-volume print Encyclopedia Britannica priced at \$1000.

In 1994, Britannica launched a Web version.

By 1997, print sales had fallen to 17% of 1990 levels due to competitors such as from Encarta. In response

In 2000 Britannica placed its entire contents free on the web, relying on advertising to support its business.

In 2002, Britannica reverted to a "member's pay" model (\$60 per year) to recoup lost revenue from advertising



## What does the future hold?

The STM business environment is robust and expanding, despite cyclical pressures on library budgets. There is plenty of capacity to experiment with new business models.

In the STM market, competition is based on quality, not price, and quality is determined by added value. Whatever the business model used, its success will be determined by the perceived value of the product to authors, readers, and advertisers and sponsors.

Just as many print journals have not stood the test of time, or are now indistinguishable from their counterparts, new internet ventures will also survive or fail not on the basis of their business model, but on their perceived value to the community.

Time will tell which business models can provide consistently high quality journals to the STM community, and it will be these journals that survive.

