

# Open Access: a funders perspective

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Conference:

Promoting 21<sup>st</sup> Century Scholarly Communication,  
University of Hong Kong, 17-18 May 2007

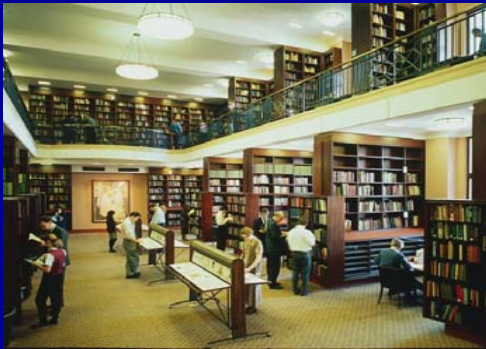
# Overview

- Discuss why the Trust supports open access (OA)
- Provide a summary of the Trust's OA policy and discuss how grantees can comply with this policy
- Highlight what the Trust requires when it pays an OA fee
- Provide some data on publisher compliance with the Trust's OA policy
- Discuss the rationale behind establishing UK PMC
- Conclusion

# The Wellcome Trust



- Largest charity in UK; second largest medical charity in the world
- Funds innovative biomedical research in the UK and internationally
- Currently spends around £500 million (7.78 billion HKD) per annum – supporting the brightest scientists with the best ideas
- Supports public debate about biomedical research and its impact on health and well-being
- Home of the Wellcome Library
- More information at: <http://www.wellcome.ac.uk>



# Why the Trust is supporting open access to the research literature

## 1. To improve the quality of of research by maximising access to the research outputs

- *Access is still an issue – Recent exercise undertaken by the Trust showed that even researchers who has access to well-funded libraries still could not access between 10%-20% of Trust-funded research papers.*
- *Research by BMC shows that 90% of NHS-funded research available online full text ; 30% immediately available to public; only 40% immediately available to NHS staff. See:  
<http://www.biomedcentral.com/openaccess/inquiry/refersubmission.pdf>*

# Access....

1: J Infect Dis. 2003 Oct 15;188(8):1239-44. Epub 2003 Sep 30. [Related Articles, Links](#)

The University of  
Chicago Press

## Safety and immunogenicity of DNA/modified vaccinia virus ankara malaria vaccination in African adults.

Moorthy VS, Pinder M, Reece WH, Watkins K, Atabani S, Hannan C, Bojang K, McAdam KP, Schneider J, Gilbert S, Hill AV.

Medical Research Council Laboratories, Banjul, The Gambia.

The present  
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Funded by the  
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and MRC

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# Why the Trust is supporting open access to the research literature

1. To improve the quality of of research by maximising access to the research outputs
2. To enable greater integration between the research literature and its underlying research data
  - *Articles linked to gene and chemical compound datasets*
  - *Data mining and the semantic web - enables the extraction of new facts from the literature*

UK PubMed Central

# Nucleic Acids Research

Journal List > Nucleic Acids Res > v.34(5); 2006

Abstract  
Full Text  
PDF (706K)  
Contents  
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Related material:  
PubMed record  
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PubMed articles by:  
Braks, J.  
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TOP  
ABSTRACT  
INTRODUCTION  
MATERIALS AND METHODS  
RESULTS  
DISCUSSION  
REFERENCES

Nucleic Acids Res. 2006; 34(5): e39.  
Published online 2006 March 14. doi: 10.1093/nar/gnj033.  
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## Development and application of a positive–negative selectable marker system for use in reverse genetics in *Plasmodium*

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Department of Parasitology, Centre of Infectious Diseases, Leiden University Medical Centre (LUMC), The Netherlands

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Received December 6, 2005; Revised February 4, 2006; Accepted February 4, 2006.

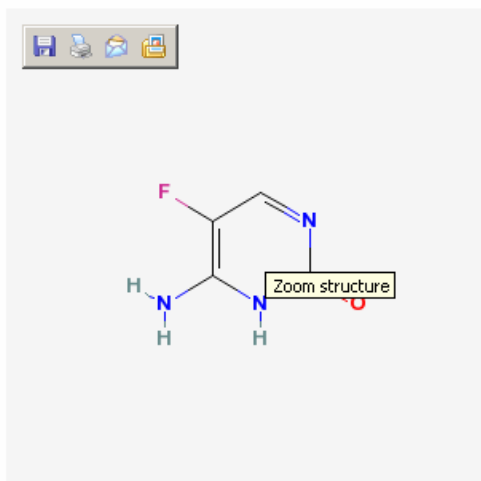
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### ABSTRACT

A limitation of transfection of malaria parasites is the availability of only a low number of positive selectable markers for selection of transformed mutants. This is exacerbated for the rodent parasite *Plasmodium berghei* as selection of mutants is performed *in vivo* in laboratory rodents. We here report the development and application of a negative selection system based upon transgenic expression of a bifunctional protein (yFCU) combining yeast cytosine deaminase and uridyl phosphoribosyl transferase (UPRT) activity in *P. berghei* followed by *in*

Programmatic linking of text to data

### Compound Summary:



- CID: 3366 [?](#) [+](#)
- BioActivity:** Summary [?](#)
  - Inactive: [99 Links](#)
  - Inconclusive: [2 Links](#)
- NLM Toxicology:** Link [?](#)
- Substances:** [?](#)
  - All: [36 Links](#)
  - Same: [26 Links](#)
  - Mixture: [10 Links](#)
- Related Compounds:** [?](#)
  - Same, Connectivity: [2 Links](#)
- Similar Compounds:** [5 Links](#) [?](#)
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[Mesh](#) [Synonyms](#) [Properties](#) [Descriptors](#) [Category](#) [Exports](#)

### Medical Subject Annotations: (Total:1) [?](#)

**Flucytosine**  
A fluorinated cytosine analog that is used as an antifungal agent.

[ShowMeSH Tree Structure](#)



# New resources from mining the literature: textpresso

- Textpresso new text-mining system for scientific literature

and of the HSN neurons of *C. elegans* is regulated at the level of % Cells expressing GFPd AVM 94 3 94 10 91 2 97 3 95 3 28 6\*\* 72 6\* 29 4\*\* 70 4\* 93 4 94 3 90 3 87 2 25 10\*\* 59 3\* PLM 100 0 100 0 100 0 100 0 100 0 54 5\* 79 2\* ND ND 84 7 97 2 ND ND 31 7\*\* 41 5\*\* DNA arraya Control Pmec-3egl-46 Pmec-7egl-46 Pmec-3egl-44e Pmec-7egl-44e Pmec-3egl-44 Pmec-7egl-44 Pmec-7egl-44 Pmec-7egl-44 Pmec-3egl-44 Pmec-3egl-44 ( R125Q ) Pmec-7egl-44 ( R125Q ) Pmec-7egl-44 ( R125Q ) Pmec-7egl-44 ( R125Q ) Pmec-3egl-44+Pmec-3egl-46 Pmec-7egl-44+Pmec-7egl-46 a All animals were injected with the pRF4 plasmid.

Supplemental links/files: [reference in endnote](#) [online text](#) [related articles](#)

Score: 1.00

Title: The Caenorhabditis elegans F-box protein SEL-10 promotes female development and may target FEM-1 and FEM-3 for degradation by the proteasome.

Author: Jager S Schwartz HT Horvitz HR Conradt B

Journal: Proceedings of the National Academy of Sciences USA Citation: V : 101 P : 12  
Literature: C. elegans Field: body Doc ID: WBPaper00024442 Accession (PMID):

Abstract: The Caenorhabditis elegans F-box protein SEL-10 and its human homolog have been shown to be involved in the ubiquitin-mediated proteasomal degradation of LIN-12 Notch proteins and Sema3, which is implicated in Alzheimers disease. We found that sel-10 is the same gene as egl-41, which has been shown to be a sex-determination gene. Mutations that semidominantly cause masculinization of the hermaphrodite soma. Our results indicate that sel-10 also have masculinizing activity, indicating that sel-10 functions to promote female development upstream of the genes fem-1, fem-2, and fem-3 and downstream of her-1 and probably trp-1. SEL-10 protein coimmunoprecipitates with FEM-1, FEM-2, and FEM-3, which are required for male development. We propose that SEL-10-mediated proteolysis of FEM-1, FEM-2, and FEM-3 is required for female development.

Matching Sentences:  
[ Sen. 33, subscore: 1.00 ]: To obtain recombinants for LGV between N2 and CB4856, the strains *nls133*, *rol-4(sc8)*, *sel-10(n1077gf)*, *unc-76(e911)* or *rol-4(sc8)* *sel-10(n1077gf)* *unc-76(e911)* were BIOLOGY DEVELOPMENTAL DEFECTIVE; CEM, cephalic companion neuron; HSN, hermaphrodite-specific neuron; gf, gain-of-function; lf, loss-of-function; shRNA, short-hairpin RNA; hsel-10, human sel-10; Sema3, semaphorin 3.

Supplemental links/files: [reference in endnote](#) [online text](#) [related articles](#)

Title: Heparan 2-O-sulfotransferase, hst-2, is essential for normal cell migration in Caenorhabditis elegans

Author: Kinnunen T Huang Z Townsend J Gatdula MM Brown JR Esko JD Turnbull JE

Journal: Proc Natl Acad Sci U S A Citation: V : 102 P : 1507-1512 Year: 2005 Type: Article

The Caenorhabditis elegans F-box protein SEL-10 promotes female development and may target FEM-1 and FEM-3 for degradation by the proteasome

Address <http://www.pnas.org/cgi/content/full/101/34/12549>

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Materials and Methods

General Methods and Strains. *C. elegans* strains were maintained at 20°C, unless otherwise noted. The strain N2 (Bristol) was the standard wild-type strain. For single-nucleotide polymorphism (SNP) mapping, the wild-type Hawaiian strain CB4856 was also used. The alleles, deficiencies, and duplications that were used in this study are as follows and are described by Riddle *et al.* (15), except where noted otherwise: LGI, *him-1(e879)*, *nls133(pkd-2:gf)* (ref. 16 and H.T.S. and H.R.H. unpublished data); LGII, *tra-2(e1875, e2019, e2021, e2531, and n1106)*; LGIII, *fem-2(bc245 and e2105)* and *lin-12(n302, n678, and n930)*; LGIV, *fem-1(hc17 and e1965)*, *fem-3(e2006 and e1996)*, *him-5(e1489)*, and *ced-3(n717)*; LGV, *dpy-1(e224)*, *her1(e1561, n695, and hv1 y101)*, *unc-42(e270)*, *lon-3(e2175)*, *rol-4(sc8)*, *sel-10(ar41, n1069, n1074, n1077, and e2055)*, *sel-10(bc189 n1077, bc243, and n4273)* (this study), *sel-10(n3717)* (H.T.S. and H.R.H., unpublished data), *sel-10(n3854, n4041, and n4046)* (B. Galvin and H.R.H. unpublished data), *him-5(e1490)*, *unc-76(e911)*, and *dpy-21(e428)*; and LGX, *sel-12(ar131)* and *sdc-1(n485)*. *nDf42* is a deficiency spanning the *sel-10* locus (17). *ctDp(V;f)* is a free duplication spanning the *sel-10* locus (18).

Mapping of *egl-41/SEL-10*. *sel-10* gf alleles have been mapped between *sqt-3* and *him-5* on LGV (13). The location of *n3717gf* was refined by using SNP mapping and the following SNPs: *pkP5069*, *pkP5070*, *pkP5086*, *pkP5088*, F55B12 9,811, and R10D12 16,645 (19). To obtain recombinants for LGV between N2 and CB4856, the strains *nls133*, *rol-4(sc8)*, *sel-10(n3717)*, *unc-76(e911)* or *rol-4(sc8)* *sel-10(n3717)* *unc-76(e911)* were injected with the pRF4 plasmid.

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Materials and Methods  
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Discussion  
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# New resources from mining the literature: Malaria Atlas Map

Malaria Journal  
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Methodology  
Longitudinal study of urban malaria in a cohort of Ugandan children: description of study site, census and recruitment  
Jennifer C Davis<sup>1</sup>, Tamara D Clark<sup>1</sup>, Sarah K Kemble<sup>1</sup>, Nalagwa Talemwa<sup>2</sup>, Denise Njama-Meya<sup>2</sup>, Sarah G Staedke<sup>1</sup> and Grant Dorsey<sup>1</sup>

1Department of Medicine, San Francisco General Hospital, University of California, San Francisco  
2Makerere University Medical School, Kampala, Uganda

Malaria Journal 2006, 5:18 doi:10.1186/1475-2875-5-18

The electronic version of this article is the complete one and can be found online at: <http://www.malariajournal.com/content/5/1/18>

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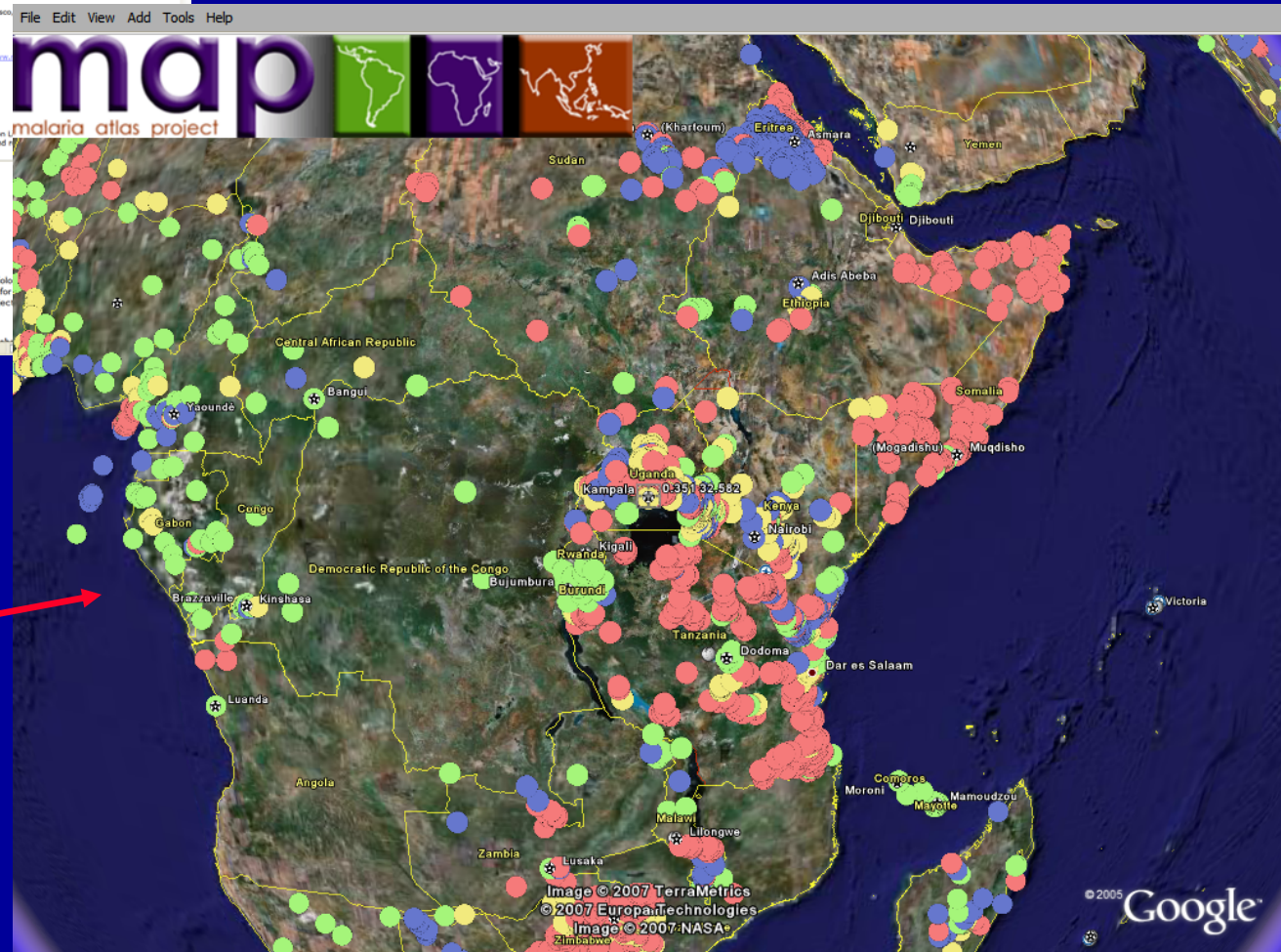
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Key:  
✉ E-mail  
✉ Corresponding author

Outline  
Abstract  
Background  
Methods

← Data mined from the research literature



“Mashed-up” with Google earth

# Why the Trust is supporting open access to the research literature

1. To improve the quality of of research by maximising access to the research outputs
2. To enable greater integration between the research literature and its underlying research data
3. Evaluation purposes
  - > *Is the £500m research spend funding making a difference?*

# Evaluation

The screenshot shows the PubMed website interface. At the top, the NCBI logo is on the left, and the PubMed logo with the text "A service of the National Library of Medicine and the National Institutes of Health" and "www.pubmed.gov" is in the center. On the right, there is a "My NCBI" button with "Sign In" and "Register" links. Below the header is a navigation bar with tabs for "All Databases", "PubMed", "Nucleotide", "Protein", "Genome", "Structure", "OMIM", "PMC", "Journals", and "Books". The search bar contains the text "wellcome trust" and has "Go", "Clear", and "Save Search" buttons. Below the search bar are buttons for "Limits", "Preview/Index", "History", "Clipboard", and "Details". The "Display" section shows "Summary" selected, "Show 20", and "Sort by" and "Send to" dropdown menus. The results section shows "All: 8524" and "Review: 1113" with a close button. Below this, it says "Items 1 - 20 of 8524" and "Page 1 of 427 Next". The first five search results are listed, each with a checkbox, a document icon, a title, journal information, and PMID. The results are: 1. Guzman MG, Alvarez M, Rodriguez-Roche R, Bernardo L, Montes T, Vazquez S, Morier L, Alvarez A, Gould EA, Kouri G, Halstead SB. Neutralizing antibodies after infection with dengue 1 virus. Emerg Infect Dis. 2007 Feb;13(2):282-6. PMID: 17479892 [PubMed - in process]. 2. McCarthy ND, Colles FM, Dingle KE, Bagnall MC, Manning G, Maiden MC, Falush D. Host-associated genetic import in Campylobacter jejuni. Emerg Infect Dis. 2007 Feb;13(2):267-72. PMID: 17479890 [PubMed - in process]. 3. Gray KJ, Bennett SL, French N, Phiri AJ, Graham SM. Invasive group B streptococcal infection in infants, Malawi. Emerg Infect Dis. 2007 Feb;13(2):223-9. PMID: 17479883 [PubMed - in process]. 4. Seymour B, Daw N, Dayan P, Singer T, Dolan R. Differential encoding of losses and gains in the human striatum. J Neurosci. 2007 May 2;27(18):4826-31. PMID: 17475790 [PubMed - in process]. 5. Chen LX, Zhu LY, Jacob TJ, Wang LW. Roles of volume-activated Cl- currents and regulatory volume decrease in the cell cycle and proliferation in nasopharyngeal carcinoma cells. Cell Prolif. 2007 Apr;40(2):253-67. PMID: 17472731 [PubMed - in process]. On the right side of the results, there are links for "Related Articles" and "Related Articles, Links". On the left side of the page, there is a sidebar with "About Entrez", "Text Version", "Entrez PubMed" (Overview, Help | FAQ, Tutorials, New/Noteworthy, E-Utilities), "PubMed Services" (Journals Database, MeSH Database, Single Citation Matcher, Batch Citation Matcher, Clinical Queries, Special Queries, LinkOut, My NCBI), and "Related Resources" (Order Documents, NLM Mobile, NLM Catalog, NLM Gateway, TOXNET, Consumer Health, Clinical Alerts, ClinicalTrials.gov, PubMed Central).

# Why the Trust is supporting open access to the research literature

1. To improve the quality of of research by maximising access to the research outputs
2. To enable greater integration between the research literature and its underlying research data
3. Evaluation purposes - is our funding making a difference?
4. Long-term preservation
  - *All current articles in PMC are marked-up in XML - future-proofing the record of medicine*
  - *Open archive – around 2 million unique IP addresses access PMC every month – 10m page views; errors quickly spotted*

# OA at the Wellcome Trust: policy

All research papers – funded in whole or in part by the Wellcome Trust – must be made freely accessible from the PubMed Central and UKPMC repositories as soon as possible, and in any event within six months of the journal publisher's official date of final publication



# How do WT grantees comply?

- Compliance can be achieved by following one of two routes:
- Route 1
  - *Publish in OA/hybrid journal [preferred route]*
- Route 2
  - *Publish anywhere - but self-archive a version of the author manuscript (must include all changes that arise from the peer-review process) and make that available from PMC/UKPMC within 6 months*
- If a publisher offers neither route then
  - *Author can make revision to the journals copyright statement – boilerplate language provided – and see if the publisher will accept this*
  - *Look for an alternative publisher*

# What does the Trust require when it pays an OA fee?

- Mandatory requirements

- *Deposit, on behalf of the author, the final version of the article - in PMC, where it must be made freely available at the time of publication.*
- *Permit these articles to be freely accessed and re-used, subject to agreed limits (for example, the commercial rights to the article would most likely continue to reside with the publisher).*
- *Allow such articles to be mirrored to PMC International repositories, such as UKPMC.*
- *Deposit the article in XML, along with high-resolution images used in the article.*
- *Sign PMC Selective Deposit Agreement*

- Desirable requirements

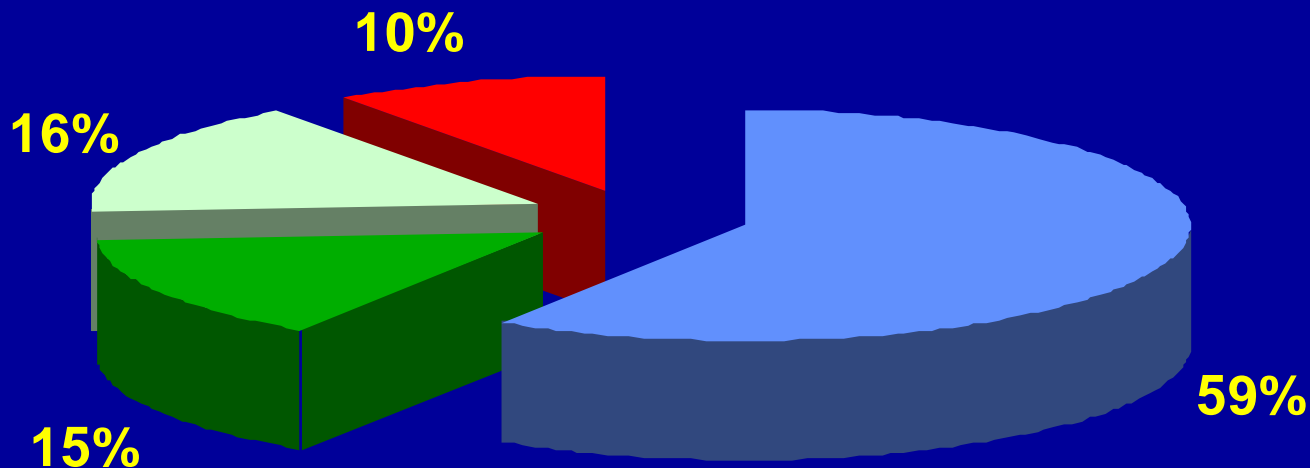
- *Deposit the publisher PDF version of the article in PMC.*
- *Make the article freely available on the publisher website at the time of publication*



# Publishers response to the Wellcome grant conditions

- Significant number of commercial and not-for-profit publishers now offer an OA option that is fully compliant with the Trust's requirements (e.g. PLoS, BMC, Springer, Elsevier, OUP, CUP, BMJPG, Sage, Taylor & Francis)
- Other publishers allow the author to self archive a version of the final article and make that available within 6 months (e.g. Nature, AAAS, AMA, Am. Physiological Assoc)
- However, some publishers have policies that do not allow Wellcome-funded authors to publish in these titles
  - *High profile publishers that do not offer a WT-compliant policy include the American Association of Immunologists, and the American Association for Cancer Research*

# Biomedical publishers: compliance with Wellcome OA policy

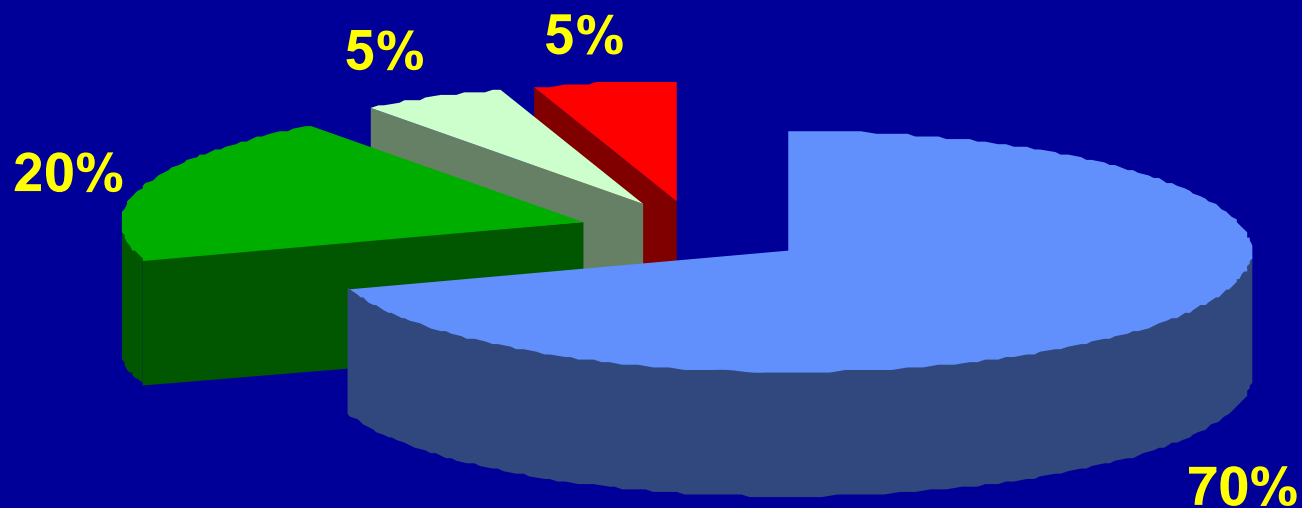


Source = RoMEO database

- WT compliant policy
- Active discussion
- No policy
- Non-compliant

# PubMed 4000 - compliance with Wellcome OA policy

PubMed 4000 study analysed papers indexed by PubMed, and attributed to WT funding, and looked to see if these were published in journals that had a WT-compliant policy



■ WT compliant policy ■ Active discussion  
■ No policy ■ Non-compliant

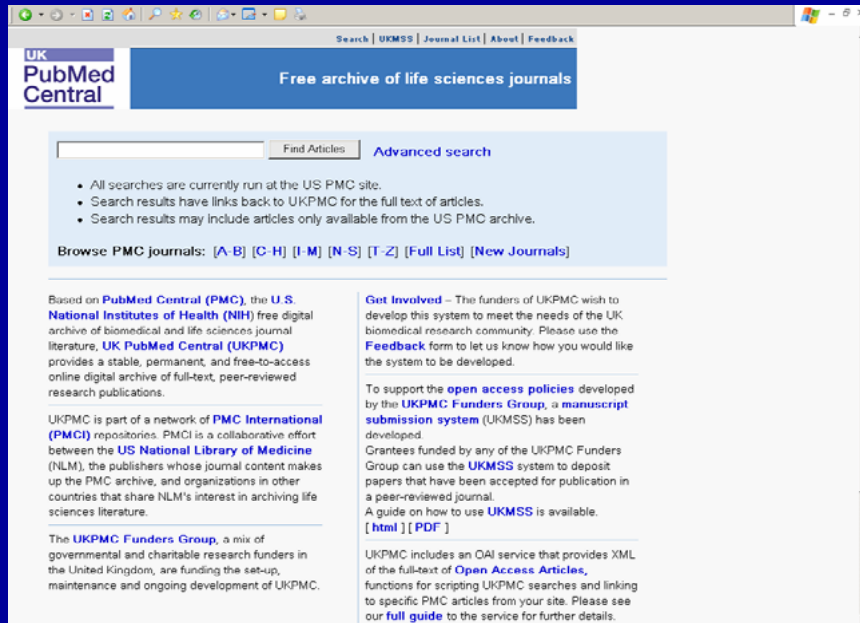
# Are Wellcome grantee's adhering to the mandate?

- Too early to tell. Policy has only been fully implemented since October 2006
  - *Pragmatic approach. If papers were “in process” before 1<sup>st</sup> October, - and the journal that accepted the paper is now deemed non-compliant – the Trust does not expect the researcher to withdraw a manuscript.*
  - *Obviously, all new papers, submitted for publication after Oct 2006, should only be submitted to “WT-compliant” journals*
- Some encouraging signs....
  - *In the first 3 months of running UKPMC 250 author manuscripts were deposited and completed*
  - *Elsevier have deposited 35 papers within the past month*
- ..but more advocacy and awareness required
  - *Only 22% of OA funds made available to UK universities in the year 05-06 has been claimed.*

# Total cost of paying for OA?

- Just funding the research is a job only part done – a fundamental part of our mission is to ensure the widest possible dissemination and unrestricted access to that research
- Trust estimates that providing OA to all the research papers it helps fund will cost between 1%-2% of its annual research budget.
  - *Approx 4000 original research papers published every year. If every single one of those papers was published as an open access article, with an average cost of £1650 per article, the total cost to the Trust would be £6.64 million; just over 1% of our annual research budget.*
  - *Trust is rarely the sole funder of a research team, and more than 80% of papers that acknowledge our support also acknowledge the support of one or more other funders. In time these costs will be spread throughout the research budget and fall below the figure estimated here.*

# UKPubMed Central



- Objective is to create a stable, permanent and free-to-access online digital archive of the full-text, peer reviewed research publications (and datasets) that arise from research funded by the UKPMC Funders Group
- 8 UK biomedical research funding organisations have joined the UKPMC Funders Group
- Estimated that around 90% of the biomedical research that is funded in the UK comes from the UKPMC funders

# UKPMC Funders Group

Funder	Mandate?	Max embargo	OA – Article Processing Charges (APC)?
arc	✓	6 mo.	Will pay APC's via grants.
BBSRC	✓	ASAP	Will pay APC's via grants.
BHF	✓	6 mo.	Will pay APC's via additional funds
CSO (Scot)	✓	6 mo.	APC can be paid from grant funds, but will not be specifically allocated.
CR-UK	✓	6 mo.	APC costs to be met from existing grants/lab budget allocations.
Dept Health	✓	6 mo.	Will pay APC's via grants.
MRC	✓	6 mo.	Will pay APC's via grants.
Wellcome Trust	✓	6 mo.	Will pay APC's via additional funds.

# Why establish UK version of PMC?



- Provides the infrastructure to enable Wellcome grantees (and others within the UKPMC Funders Group) to comply with their grant conditions
- A UK version of PMC will benefit the Trust, its partners and the UK research community in a number ways:
  - *UK-focussed services - evaluation of funding; development of new metrics that could feed into a future RAE*
  - *Local ingestion of UK documents e.g. NICE guidelines, MRC reports*
  - *Enhanced functionality - integration with grants systems, text mining services with other open data sources*
  - *Long term preservation of the record of medicine becomes a shared responsibility*
  - *Helps to ensure that the OA principles espoused by the Trust become a reality in the UK*



# UKPMC – systems and services



- Systems
  - *A UK-hosted mirror of PMC*
  - *A manuscript submission and tracking system for UKPMC grantees*
- Services
  - *Robust, secure and scalable infrastructure*
  - *Manuscript conversion facilities*
  - *Helpdesk*
  - *Communications and marketing*
  - *R&D*
- Contract to run and develop UKPMC services has been awarded to a consortium led by the British Library in association with University of Manchester and European Bioinformatics Institute
- UKPMC went live in January 2007 – see <http://ukpmc.ac.uk>

# Conclusion

- The way original research papers are disseminated and made available is changing.
  - *Funders are demanding more; publishers are responding to this need*
- In the UK, biomedical research funders have agreed a common approach to OA, and now have the infrastructure in place (UKPMC) to help realise our objectives.
- Dissemination costs are research costs
- “Ensuring that the outputs of research are freely available to all is the best way to maximise their utility.” Sir John Sulston, 2006 .