

## Literature services



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PhD in plant biology, Manchester Metropolitan University, 1990. Editor, *Trends in Biochemical Sciences*, Elsevier, Cambridge, UK, 1997. Staff Scientist, NCBI, National Library of Medicine, NIH, USA, 2009. Team Leader at EMBL-EBI since 2009.

### DESCRIPTION OF SERVICES AND RESEARCH

The scientific literature often represents both the start and end point of a scientific project. However, as with other biomedical data resources, the volume of articles published is overwhelming, too much for any one person to read. Placing the literature within the context of related public data resources will equip researchers better for data analysis, navigation and discovery.

With several thousand new research articles published every day, linking articles to each other – and to the broader scientific literature such as textbooks, theses and patents – will become a necessity if we are to leverage the investment in scientific research to greater potential. Text-mining represents a high-throughput approach to the identification of biological concepts in articles, which can then form the basis for the development of new applications and stimulate precise, deep linking to related data resources in the future.

The goal of Literature Services at EMBL-EBI is to build text-based resources for the life sciences, integrated with other public-domain data resources hosted at EMBL-EBI. To this end, we run two literature databases: CiteXplore and UK PubMed Central. CiteXplore contains over 26 million abstracts and includes PubMed as well as data from Agricola and patents from the European Patent Office. UK PubMed Central comprises over 2 million full-text articles, of which about 400 000 are open access.

The databases are linked to a number of EMBL-EBI data resources by (1) using the references appended to database records by curators and submitters, and (2) through text mining to identify terms of interest, such as gene symbols, and using these to link to appropriate databases.

We also calculate citation network information for the records we hold: over 10 million articles have been cited at least once, representing the largest public-domain citation network in the world. We plan to use this infrastructure to develop novel and useful search and browse features for publications mapped to data, and to share the article content and annotation as widely as possible, both programmatically and for individual users.

### SUMMARY OF PROGRESS

- Assumed leadership of UK PubMed Central (April 2011 – April 2016).
- Improved technical coordination of UK PubMed Central by serving all components (database, indexing, application) from EMBL-EBI.
- Handled over 8 million web service requests per month.
- Introduced citation-count sort order for our citation network of over 10 million cited articles.
- Partnered with OpenAIRE Plus to explore dataset management options.

**CiteXplore - search results**

AUTH: "Sanger F"

Sort by:  Publication Date  Most cited  Most relevant  Synonyms

First Previous Result set size : 93 Page: 1 of 4 Page size : 25 Next Last

**More** **DNA sequencing with chain-terminating inhibitors.** PubMed ID:271968 Score: 888  
 Sanger F, Nicklen S, Coulson AR  
 Proc Natl Acad Sci U S A [1977 (74)] page info:5463-7  
 Cited: 23191 times

**More** **Sequence and organization of the human mitochondrial genome.** PubMed ID:7219534  
 Anderson S, Bankier AT, Barrell BG, de Bruijn MH, Coulson AR, Drouin J, Eperon IC, Nierlich DP, Roe BA, Sanger E, Schreier PH, Smith AJ, Staden R, Young IG

Figure 1. CiteXplore search result.

## MAJOR ACHIEVEMENTS

The major achievements of the Literature Services centred on winning the contract and grant ward to run UKPMC from April 2011, with the service running fully from EMBL-EBI by July 2011. This new and high-profile responsibility for EMBL-EBI will give rise to future integration and development opportunities impacting all data resources at EMBL-EBI. Furthermore, it is a step towards realizing the vision of UKPMC – to evolve into a European resource of international importance.

## FUTURE PLANS

Building on the article collections and websites we host at EMBL-EBI, we plan to extend UK PubMed Central and CiteXplore into a cohesive literature search-and-retrieval system that represents European science on a global scale. In the near future, we will add the full text of a number of books and reports alongside the research article collection. We will also further the concept of 'Literature Labs', which will be an opportunity for us to engage actively with the text-mining community in road-testing applications based on UK PubMed Central and CiteXplore content that will enable us to integrate the literature with public data resources more deeply.

### Selected publication

McEntyre, J.R. Ananiadou, S., *et al.* (2011) UKPMC: a full text article resource for the life sciences. *Nucleic Acids Res.* 39 (Database issue), D58-65.



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### Essential but differential role for CXCR4 and CXCR7 in the therapeutic homing of human renal progenitor cells.

(PMCID:PMC2271008)

Mazzinghi B, Ronconi E, Lazzeri E, Sagrinati C, Ballerini L, Angelotti ML, Parente E, Mancina R, Netti GS, Becherucci F, Gacci M, Carini M, Gesualdo L, Rotondi M, Maggi E, Lasagni L, Serio M, Romagnani S, Romagnani P

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The Journal of Experimental Medicine [2008, 205(2):479-90]

Type: Journal Article, Research Support, Non-U.S. Gov't

DOI: 10.1084/jem.20071903

#### Abstract

#### Highlight Terms

Gene Ontology(2)
  Diseases(1)
  Genes/Proteins(4)
  Species(2)

Recently, we have identified a population of renal progenitor cells in human kidneys showing regenerative potential for injured renal tissue of SCID mice. We demonstrate here that among all known chemokine receptors, human renal progenitor cells exhibit high expression of both stromal-derived factor-1 (SDF-1) receptors, CXCR4 and CXCR7. In SCID mice with acute renal failure (ARF), SDF-1 was strongly up-regulated in resident cells surrounding necrotic areas. In the same mice, intravenously injected renal stem/progenitor cells engrafted into injured renal tissue decreased the severity of ARF and prevented renal fibrosis. These beneficial effects were abolished by blocking either CXCR4 or CXCR7, which dramatically reduced the number of engrafting renal progenitor cells. However, although SDF-1-induced migration of renal progenitor cells was only abolished by an anti-CXCR4 antibody, transendothelial migration required the activity of both CXCR4 and CXCR7, with CXCR7 being essential for renal progenitor cell adhesion to endothelial cells. Moreover, CXCR7 but not CXCR4 was responsible for the SDF-1-induced renal progenitor cell survival. Collectively, these findings suggest that CXCR4 and CXCR7 play an essential, but differential, role in the therapeutic homing of human renal progenitor cells in ARF, with important implications for the development of stem cell-based therapies.

Figure 2. UK PubMed Central in 2011. EMBL-EBI will be leading the project until 2016.

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#### Formats

Abstract

Full Text

PDF

Export citation

Email citation

#### Search by Subject

Acute Kidney

Animals

Cell Line

Cell Movement

Cells, Cultured

Chemokines

Endothelial Cells

Epithelial Cells

Female

Humans

Kidney

Mice

Mice, SCID

Multipotent

Receptors, Chemokine

Receptors, Cell