



Mapping gene expression with Gene Expression Atlas

Hinxton, 15 June 2009 – Today, researchers at the European Molecular Biology Laboratory's European Bioinformatics Institute (EMBL-EBI) launch a new database, the Gene Expression Atlas, which allows scientists to search and compare gene expression data at unprecedented detail and scope. Observing how gene expression varies in different cell types, tissues and under disease conditions can help researchers understand gene function and to develop new drugs and therapies.

Although most cells in an organism share the same genetic information, different cell types, for example skin and liver cells, have different properties and functions, largely because different genes are active in these cells. The Gene Expression Atlas is a new database that allows users to query gene expression under a range of biological conditions, including different cell types, developmental stages, physiological states, phenotypes and disease states. The key questions this new database can answer can be summarised as:

- 1) under which conditions is my particular gene of interest expressed?
- 2) which genes are expressed in a particular condition? For example, what genes are specifically active in kidney cells, or how does the expression of genes in leukemic blood differ compared to normal blood?

Both questions can also be combined to focus on particular genes and their role in a specific disease, such as

identifying members of the Wnt signalling pathway that are expressed in cancer.

The Atlas collates data from over 1000 different independent studies, mainly microarray experiments, with more than 30,000 samples in total. The new database is the latest product of the EBI's Microarray Informatics group and has its origins in the EBI's ArrayExpress resource. After a phase of development, the Atlas is ready to begin its own life as an independent major resource. Misha Kapushesky, Atlas project leader at the EBI commented, "While the ArrayExpress Archive makes data from high throughput functional genomics assays available to experts, Gene Expression Atlas presents this information in a format accessible to any biologist. The Atlas takes data directly from the ArrayExpress Archive, which is then enriched by curation, re-annotation and statistical computations before the results are presented to the user in an easily accessible form."

The Gene Expression Atlas has already found use in the pharmaceuticals industry as a valuable research platform. The resource can be accessed from <http://www.ebi.ac.uk/gxa> and the Microarray Informatics group have produced an e-learning tutorial to guide users on how to get the most from the Atlas. This tutorial is freely available from the EBI's e-learning portal at <http://www.ebi.ac.uk/training/elearning-central/>. ●

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About EMBL-EBI:

The European Bioinformatics Institute (EBI) is part of the European Molecular Biology Laboratory (EMBL) and is located on the Wellcome Trust Genome Campus in Hinxton near Cambridge (UK). The EBI grew out of EMBL's pioneering work in providing public biological databases to the research community. It hosts some of the world's most important collections of biological data, including DNA sequences (EMBL-Bank), protein sequences (UniProt), animal genomes (Ensembl), three-dimensional structures (the Macromolecular Structure Database), data from microarray experiments (ArrayExpress), protein-protein interactions (IntAct) and pathway information (Reactome). The EBI hosts several research groups and its scientists continually develop new tools for the biocomputing community.

About EMBL:

The European Molecular Biology Laboratory is a basic research institute funded by public research monies from 20 member states (Austria, Belgium, Croatia, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom) and associate member state Australia. Research at EMBL is conducted by approximately 80 independent groups covering the spectrum of molecular biology. The Laboratory has five units: the main Laboratory in Heidelberg, and Outstations in Hinxton (the European Bioinformatics Institute), Grenoble, Hamburg, and Monterotondo near Rome. The cornerstones of EMBL's mission are: to perform basic research in molecular biology; to train scientists, students and visitors at all levels; to offer vital services to scientists in the member states; to develop new instruments and methods in the life sciences and to actively engage in technology transfer activities. EMBL's International PhD Programme has a student body of about 170. The Laboratory also sponsors an active Science and Society programme. Visitors from the press and public are welcome. www.embl.org

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