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New era for the European Bioinformatics Institute

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Bioinformatics is increasingly important as the means of turning genomic and other biological data into new knowledge about how whole organisms work. Janet Thornton, Professor of Biomolecular Structure and Modelling at [University College London](#), (UCL) takes up the post of Director of the [European Bioinformatics Institute](#) (EBI) next month (October 2001), with a remit - and new money - to expand its research activities. The development is a huge boost for bioinformatics in Europe and should benefit all sections of the biological community.

The EBI is located at the [Wellcome Trust](#) Genome Campus at Hinxton, Cambridgeshire, a site shared by the [Sanger Centre](#) and the UK Medical Research Council [Human Genome Mapping Project Resource Centre](#). It is part of the [European Molecular Biology Laboratory](#) (EMBL), an international network of research institutes funded by EU countries, Switzerland and Israel and headquartered in Heidelberg, Germany. In 1980, EMBL established the world's first nucleotide database; EBI has built on this work, creating and maintaining a number of public domain databases covering gene and protein sequences, biological macromolecular structures and, more recently, gene expression data.

"I see the research being built around these core resources and interacting with them. For example, my own research is very much to do with protein structures, but it goes into sequences and into genomes too. It will make a difference being here with the people developing these resources, who understand what's in them," said Thornton who has been seconded for five years to EBI from her current job as Head of the Birkbeck/UCL Joint Research [Bloomsbury Centre for Structural Biology](#).

She also wants to see groups - some headed by researchers with outside funding - in new areas, such as gene expression, transcriptome and proteomics data, as well as evolutionary and phylogenetic aspects. "I am also interested in the link between bioinformatics and cheminformatics - the small molecules - since biology is not just about the big molecules. At the moment bioinformatics has dealt mostly with single molecules and single genes but the future is clearly about looking at networks of interactions and modelling whole systems and whole animals. The problem of going from genotype to phenotype is one of understanding how all these different things interact and that's the push I think we have to make." She also believes that links with experimental biologists will be critical for taking areas such as functional genomics further.

The core resources - the databases - will also be enhanced and extended. For instance, ArrayExpress - due to come on-line soon - gives researchers access to experiments using DNA chips, which can provide a snapshot of the simultaneous activity of thousands of genes. And as data continue to flood in, ensuring quality, and integration it are major challenges. "You have to develop as many computational tools as you can for quality assurance, but you also need annotators - people who will actually look each entry to the database." Thornton's predecessor at EBI, Michael Ashburner (who is now to return to full-time research at Cambridge University) is one of the founders of an initiative called [GO](#) (gene ontology), which involves building controlled vocabularies which will assist in the cross-searching of the databases.

Another priority for Thornton is building links with industry. Currently the EBI Industry Programme provides a service to a number of large pharmaceutical companies that includes bioinformatics training and education. "One of the key things in the European context is training - not in basic things like how

to do a BLAST search but in training the trainers, so they can in turn train up future bioinformatics specialists."

As co-founder of a UCL spin-off, Inpharmatica, Thornton is well aware of the need to provide such a service to smaller biotech companies as well as to the big pharmaceutical companies. "I want to extend the Industry Programme to provide an interface for smaller companies, because I think that's where the future prosperity in Europe, as much as in the large pharma."

EBI receives core funding of 8.4 million euros a year from EMBL, which is set to increase to 11.4 million euros to help support the expansion in its research activities, while the Wellcome Trust provides 2 million euros annually for EnsEMBL (the genome database) and also funds the structural MSD (macromolecular structure) database. In addition, the EU has just awarded the EBI a three year grant of 19 million euros - a reversal of an earlier decision that it would not support scientific infrastructure within its Framework Programme, which left EBI cash-starved for nearly two years, despite a rescue package put together by EMBL.

Graham Cameron, EBI Associate Director who coordinated the efforts to gain the EU money, warns that there is a need for permanent and increased funding for the databases, and that EBI receives only a fraction of the money of US and Japanese counterparts, the [National Center for Biotechnology Information](#) (NCBI) and the [DNA Data Bank of Japan](#) (DDBJ), while facing the same demands. "The electronic record is part of the fabric of the science infrastructure and the scale up is going to be immense, so we are going to have to find some permanent and robust way of funding it," he said.

But as the funding future of the databases remains uncertain, the UK has opened up its research funding to EBI, since Thornton's appointment. "We are classed as an 'academic analogue' and can now apply for Research Council and Wellcome Trust grants as if we were a university," she said. "I believe this has happened because they are starting to realise that bioinformatics is going to be at the centre of biology over the next 20 years and there is a need to train more people. Bioinformatics is an expanding and vibrant area and I think at the EBI we are in a really special position because of these core resources. There is nowhere else in the world, let alone in Europe, which has the concentration of expertise in handling the range of biological data that we have here."

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