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## **EuroDYNA leaves healthy genomic research ecosystem as legacy**

Europe's position as a major player in genome research has been boosted by the European Science Foundation's three-year EUROCORES programme EuroDYNA. As it draws to a close, EuroDYNA (Dynamic Nuclear Architecture and Chromatin Function) is leaving behind a healthy European ecosystem of interacting multidisciplinary research projects focused on the structure of the cellular nucleus and mechanisms governing gene expression.

The greatest benefit of EuroDYNA has been in stimulating interaction among the various Collaborative Research Projects (CRPs) that had already been established, according to Graham Tebb, a scientific administrator for genetics, microbiology, biotechnology and cell biology at the FWF (Fonds zur Förderung der Wissenschaftlichen Forschung), the Austrian agency for funding basic research. "I was pleased to see the links between the CRPs," said Tebb. "That's the real added value."

The success of EuroDYNA in creating European momentum behind research into chromatin structure and gene regulation was widely acknowledged at the programme's third and final meeting, held at the Wellcome Trust Conference Centre near Cambridge, UK, late May 2008. "The ESF grant had a galvanising effect on our project, increasing credibility on a local, national and international level," said Colin Logie from Nijmegen University in the Netherlands, head of one of the EuroDYNA projects, "Chromatin Higher Order Dynamics: A single molecule approach". Logie pointed out that research into the dynamic structure of chromatin, the nuclear complex of proteins and DNA where 99.99% of all genes reside in higher organisms, requires increasing interaction between biologists and physicists, which has been accomplished within his project, leading to new insights into chromatin structure.

Logie and other project leaders also highlighted an issue common to most if not all projects relating to genomic structure, which is the high cost of meeting the growing genome-wide profiling challenge. Rene Ketting from the Hubrecht Institute for Developmental Biology in Utrecht, in the Netherlands, and David Shore from the University of Geneva's Department of Molecular

Biology, suggested there should in future be separate provision for the cost of protein chromosomal location by ChIP-seq, genome-wide RNA profiling and the concomitant bioinformatics analyses, which otherwise could easily consume budgets and reduce the resources available for dedicated laboratory experiments. Alternatively at least some aspects of genomic profiling could be provided as a service by major funding agencies or research councils. The role of EuroDYNA not just in fostering collaboration between disciplines and countries, but also in highlighting such future funding issues, was acknowledged by many of the project leaders and scientists present at the final conference.

The best measure of EuroDYNA's success though lies in the cross fertilisation between different multi-disciplinary CRPs, some of which were sparked by unexpected breakthroughs. A good example is the serendipitous discovery of the close and important relationship between two proteins, cohesin and CTCF, in regulating the expression and transcription of genes. This subsequently brought two separate groups within EuroDYNA together, one from the Institute of Molecular Pathology (IMP) in Vienna on the control of the chromosome structure by Cohesin, and the other from Erasmus Medical Centre in Rotterdam working on the role of the zinc finger CTCF proteins in the cell cycle and differentiation processes. The discovery that cohesin and CTCF are intimately linked was made by the group of Jan-Michael Peters at the IMP. Subtle deficiencies in this relationship might lead to a group of diseases known as "cohesinopathies" that are more common than once thought because they are frequently misdiagnosed. One such disease is Cornelia de Lange syndrome, causing various developmental abnormalities such as low birth weight, delayed growth, and small head size.

EuroDYNA, and indeed the ESF in general, has made a major contribution to the development of multinational, multidisciplinary funding models that reduce the bureaucratic and logistical hurdles that scientists need to overcome both in complex and smaller scale projects, whenever European collaboration is required. However some scientists at the EuroDYNA conference argued that the ESF could stimulate collaboration even further by extending the timespan of projects from three to four or even five years, potentially with a mid-term review after three years. This was recommended

by Juan Ausio from the Department of Biochemistry and Microbiology, University of Victoria. Ausio, who is a member of the EuroDYNA review panel, pointed out that in Canada funding for scientific projects typically runs for five years, and gives the scientists longer to establish lasting collaborations and derive real value from them. “It saves a lot of resources and effort,” said Ausio. “It especially decreases the burden on the reviewers’ side and it decreases significantly the administrative effort of the funding agencies.”