



Embargoed until Sunday, 3 May 2009, 18:00 BST

Getting a grip on complexes: EMBL scientists develop first fully automated pipeline for multiprotein complex production

Grenoble, 3 May 2009 - Most cellular processes are carried out by molecular machines that consist of many interacting proteins. These protein complexes lie at the heart of life science research, but they are notoriously hard to study. Their abundance is often too low to extract them directly from cells and generating them with recombinant methods has been a daunting task. A new technology to produce multiprotein complexes, developed by researchers at the European Molecular Biology Laboratory (EMBL) in Grenoble, France, and the Paul Scherrer Institute (PSI) in Villigen, Switzerland, now makes the biologist's life easier.

In a paper published in the current issue of *Nature Methods* researchers of the groups of Imre Berger at EMBL and Michel Steinmetz at the PSI describe ACEMBL, the first fully automat-

ed pipeline for the production of multiprotein complexes. Requiring much less effort and materials, the new pipeline will speed up structural studies of protein complexes and will allow to decipher as yet elusive molecular mechanisms of health and disease.

ACEMBL can produce complexes consisting of different types of components, including protein, RNA and other biomolecules. Currently designed to express proteins in the standard system *Escherichium coli*, the automated pipeline will in future be adapted for complex production in eukaryotic cells. This will allow the study of even larger, more complicated complexes of human origin, including many promising drug targets. The system has already attracted commercial interest. ●

Source Article

Bieniossek, C., Nie, Y., Frey, D., Olieric, N., Schaffitzel, C., Collinson, I., Romier, C., Berger, P., Richmond, T.J., Steinmetz, M.O. & Berger, I. Automated Unrestricted Multigene Recombineering for Multiprotein Complex Production. *Nature Methods*, 3 May 2009

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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.

About EMBL Grenoble

The EMBL Outstation in Grenoble, France, is located in very close proximity to two unique European facilities for research in structural biology: the nuclear reactor of the Institut Laue-Langevin (ILL), which provides high flux neutron beams, and the European Synchrotron Radiation Facility (ESRF), which produces Europe's most intense X-ray beams. EMBL Grenoble collaborates very closely with both of these facilities in building and operating beamlines for macro-molecular crystallography, in developing the associated instrumentation and techniques, and in providing biochemical laboratory facilities and expertise to external visitors, as well as supporting an active in-house research programme in structural biology.

About the Paul Scherrer Institute

The Paul Scherrer Institute develops, builds and operates large and complex research facilities, and makes them available to the national and international scientific community. Its own work concentrates on solid-state research and material sciences, elementary particle physics, biology and medicine, energy research and environmental research. With a staff of 1300 and an annual budget of approximately CHF280 million, this is Switzerland's largest research institution.

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