Virtual research institute needed to unlock RNA's promise

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A Europe-wide network of labs focusing on RNA research is needed to make the most of RNA's high potential for treating a wide range of diseases. The recommendation for this virtual research institute comes from a panel of biologists at the European Science Foundation in a report published today, 'RNA World: a new frontier in biomedical research'.

Ten years on from the human genome project, RNA (ribonucleic acid) has stolen some of DNA's limelight. The basic ingredient of our genes, DNA long outshone the other form of genetic material in our cells, RNA. RNA was seen as a simple stepping stone in the cell's gene-reading activities.

Research over the last decade has shown RNA to be a remarkable molecule and a multi-talented actor in heredity. It is thought to be a major participant in the chemical reactions that led to the origins of life on Earth - the 'RNA World' hypothesis. RNA also controls genes in a way that was only recently discovered: a process called RNA interference, or RNAi. Medical researchers are currently testing new types of RNAi-based drugs for treating conditions such as macular degeneration, the leading cause of blindness, and various infections, including those caused by HIV and the herpes virus.

"RNA could bring significant advances to the diagnosis, treatment and prevention of many human diseases," said Professor Jörg Vogel from the University of Würzburg, Germany, who co-chaired the report. "In the

global context, it's surprising that Europe doesn't have many centres specifically funded for and dedicated to it, particularly in comparison to the US. We strongly recommend creating a network of RNA centres, linked together as a Europe-wide 'virtual institute'. A first step could involve calls through the European Commission and national funders. "

The virtual RNA institute would be made up of locally-funded, multidisciplinary centres with a critical mass of strong research groups in disciplines such as biology, biochemistry, chemistry, genetics, bioinformatics, biophysics, structural analysis, microbiology, plant sciences and clinical medicine. This environment could be well-suited to promoting superior training of a generation of young scientists, PhD students and postdoctoral researchers. They could also help deliver dedicated education programmes for RNA research, which are currently lacking.

A particular area where an increasing demand in the future can be foreseen is, as in almost all other areas of life science, bioinformatics. "A new generation of bioinformaticians needs to be trained to meet future demand, in RNA research and in many other areas of the life sciences," continues Professor Vogel.

New models for public funding of infrastructure and resources for promising compounds to be used in the clinic should be developed. The financial burden for taking basic compounds and developing them into drugs could be shared by academic-industrial partnerships.

'RNA World: a new frontier in biomedical research' reviews the high pace of discovery in RNA research and gives a 5-10 year outlook of how both basic RNA research and its use in clinical practice should develop. Nine thematic priority areas were identified to address new and promising opportunities for biomedical, biotechnological, pharmaceutical and clinical RNA research.

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