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PRESS RELEASE

EMBO Gold Medal 2010 recognizes **Jason W. Chin**

Synthetic biologist pioneered genetic code reprogramming

Heidelberg, Germany, 10 May 2010 – The European Molecular Biology Organization (EMBO) today announced the award of the EMBO Gold Medal 2010 to Jason W. Chin from the Medical Research Council's Laboratory of Molecular Biology (MRC-LMB).

Chin receives the award for his pioneering work on reprogramming the genetic code. Chin's work allows designer amino acids to be encoded at specific, predetermined positions in proteins *in vivo*, enabling molecular biologists to control and elucidate the functions of proteins in cells with unprecedented precision.

Each year, the European Molecular Biology Organization (EMBO) awards the EMBO Gold Medal – widely regarded as one of the most prestigious life sciences awards in Europe – to recognize the outstanding contributions of young researchers in the molecular life sciences.

Upon hearing that he had been awarded the medal for 2010 Jason said: "Given all the great science happening in Europe right now I am delighted to receive this award. I am very grateful to all my colleagues who have made the science possible."

Chin's work "identifies him as an outstanding molecular biologist of his generation," commented Paul Nurse, President of Rockefeller University. "Jason is one of the most brilliant, original and imaginative scientists I know," added Venki Ramakrishnan, who is also at MRC-LMB.

Chin's work centers on reprogramming the genetic code – the code of life that contains the information necessary for synthesizing molecules that allow organisms to survive and replicate. DNA is copied to messenger RNA in cells; triplet codons in the messenger RNA (mRNA) are then decoded in the process of translation to make proteins composed of a canon of 20 naturally occurring amino acids.

With his group of researchers at the MRC-LMB, Chin is rewriting this central dogma to create organisms that synthesize proteins containing designer amino acids. He has developed molecular biology tools to incorporate the designer amino acids into proteins, allowing his group to investigate the role of protein interactions and post-translational modifications in diverse biological processes. Chin's group has genetically encoded acetyl-lysine and methyl-lysine into proteins. This has allowed Chin, in collaboration with Daniela Rhodes who is also at MRC-LMB, to construct 'designer chromatin' to define the role of post-translational modifications in epigenetics and DNA-dependent processes such as DNA repair, transcription and replication.

"As a direct consequence of his work molecular biologists can now answer a panoply of important questions about the molecular and cellular functions of proteins and protein post-translational modification with a previously unimagined molecular precision,"

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commented Kim Nasmyth, Head of the Department of Biochemistry at the University of Oxford.

Jason Chin began his quest to rewrite the genetic code during his postdoctoral research years at The Scripps Research Institute in California. There he pioneered the development of an orthogonal aminoacyl-tRNA synthetase/ $tRNA_{CUA}$ pair to direct the incorporation of designer amino acids into proteins in response to the amber stop codon.

Since establishing his independent group at MRC-LMB Chin has developed general methods for creating new orthogonal aminoacyl-tRNAsynthetase/ tRNA pairs and created new orthogonal ribosomes that decode quadruplet rather than triplet codons. By bringing together the new ribosomes and aminoacyl-tRNA synthetases in the same cell he has created a new translation system that operates in parallel with natural protein translation and allows the incorporation of multiple designer amino acids into proteins in cells.

"The translation system really represents the ultimate paradigm for assembling polymers of defined sequence," Chin explains. "We would like to be able to synthesize and evolve designer polymers in cells."

The new polymers Chin envisions might offer key benefits for the creation of stable protein-like therapeutics and enable the discovery and synthesis of biological plastics and other materials. "Our work builds on decades of research that have provided a fundamental structural and mechanistic understanding of how protein translation functions. Using this knowledge to create new systems that help us further understand biology at the molecular level and provide enabling technologies for encoded polymer synthesis is really exciting. We are just at the beginning of investigating what might be possible," Chin notes.

In 2005, Chin was selected to benefit from the highly competitive EMBO Young Investigator Programme. The Royal Society honoured him with the Francis Crick Prize Lecture in 2009. In addition to core funding from the MRC for his lab, his research benefits from an ERC Starting Grant (2008-2013) and an HFSP program grant (2009-2012).

The prizewinner will receive the EMBO Gold Medal and an award of 10,000 euro on 6 September 2010 at *The EMBO Meeting* in Barcelona where he will give a special lecture about his research.

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Four leading peer-reviewed journals – The EMBO Journal, EMBO reports, Molecular Systems Biology and EMBO Molecular Medicine – span a broad spectrum of topics of molecular biology and reflect how science is shaping the world.

EMBO funding, training and networking activities impact thousands of scientists every year, promoting collaboration in all areas of molecular biology – within its 27 member states, in Europe and neighbouring countries, and worldwide.

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