



## A SYNTHETIC BIOLOGY REVOLUTION

The MRC Laboratory of Molecular Biology's (LMB's) Professor Jason Chin has pioneered a revolutionary technique to make proteins made up of entirely new amino acids (the building blocks of proteins), that are not found in nature. In 2012, he successfully applied this technique to the fruit fly, which shares many of its genes with humans, opening up the possibility of using his approach to study processes important to behaviour, learning and neurodegenerative disease.

Jason's research group at LMB has invented an entirely new toolkit for science, allowing proteins to be engineered with unprecedented precision. This not only provides a new way of investigating how diseases work at the molecular level, but also gives scientists the ability to produce new treatments with exceptional properties.

"Sooner or later I think that more drugs will be protein therapeutics, and our ability to 'soup-up' these proteins with synthetic biology approaches could vastly expand their scope," says Professor Chin. For example, a biotech company in San

Diego, Ambrx, is carrying out a clinical trial of a protein therapeutic for growth deficiency. The protein incorporates synthetic amino acids, which they hope will make the drug more stable in the blood so that patients need to take less of it than they normally would.

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Tags: MRC Laboratory of Molecular Biology, neurodegenerative disease

## Case Studies

1. Profile A: Professor Stephen Holgate, Non-Executive Director, Synairgen plc
2. Profile B: Dr Tim Denison, Director of Core Technology and Technical Fellow, Medtronic Inc, Minneapolis, US
3. Disease research to benefit from pharma collaboration
4. Increasing the speed of bright
5. Gout drug offers hope for heart disease patients
6. Stratified medicine initiative takes shape
7. A phenomenal London 2012 legacy
8. A new stem cell institute for Cambridge
9. New resource will collect and catalogue stem cells
10. New centres put health records at the heart of UK medical research
11. New research collaborations with China
12. Public-private imaging centre to speed drug development
13. £14m investment to accelerate drug development
14. A synthetic biology revolution
15. MRC science behind potential drugs for Alzheimer's and depression
16. Re-designing the molecules of life
17. New biobank to aid faster diagnostics