

Largest ever epigenetics project launched

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One of the most ambitious large-scale projects in Human Genetics has been launched today: Epitwin will capture the subtle epigenetic signatures that mark the differences between 5,000 twins on a scale and depth never before attempted, providing key therapeutic targets for the development of drug treatments.

The project is a collaboration between TwinsUK, a leading twin research group based at King's College London, and BGI, one of the world's largest genomic organisations headquartered in Shenzhen, China.

[Epigenetics](#) is the most cutting edge emerging field in Genetics, which explores how the actions of genes can be temporarily modified by [chemical reactions](#) that may occur either at random or by lifestyle or diet. This effect may last several generations.

The plan is to look at the methylation patterns of 20 million sites (called CpG islands) in the DNA of each twin and compare them with the patterns in the co-twin. Rather than looking at similarities as in previous studies, the team will be looking for differences that explain why many identical [twins](#) don't develop the same diseases. Initially the team will focus on obesity, diabetes, allergies, [heart disease](#), osteoporosis and longevity, but the method can be applied to every common trait or disease.

'Finding the crucial differences between twins will lead us to the key genes that are being turned on and off, and so to the cause of disease, with great potential to find key targets for drug treatments,' says Tim Spector, Director of TwinsUK and Professor of Genetic Epidemiology

at King's College London, who is leading the project. 'The fact that twins are such a marvellous natural experiment, combined with the hundreds of disease details and traits on the twins that we have collected over 17 years, offer a unique study opportunity. So far this type of study has only been attempted on a handful of twins, so we want to scale it up - one thousand fold.'

The Executive Director of BGI, Professor Jun Wang, whose team completed the sequencing of many diverse species, including an Asian individual, the Giant Panda, the rice genome, the silkworm [genome](#), and the genomes of the cucumber and ant, is excited about the study: 'Epigenetics is one of our major targets for the next five years - and this combination of our technology and resources with the unique twin resource will provide the world with an unprecedented dataset. We hope to unlock many secrets about [human genetics](#) that we don't currently understand, and to accelerate research and applications in human healthcare.'

The project is expected to cost around £20 million (\$30 million). These costs are being shared by the groups, and supported by a Senior Investigator award to Professor Spector for the EpiTwin project by the European Research Council.

Provided by King's College London

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