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[\[生物科技\] 中央大學基因甲基化研究對傳統基因決定論提出新挑戰](#)

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中央大學系統生物與生物資訊研究所助理教授王孫崇參與的一項國際性雙胞胎研究，證實了除了基因體自身外，基因體上的甲基化（即基因體的化學修飾）分佈差異，也影響人與人之間，特別是同卵雙胞胎之間的差異。尤其因為甲基化可靠後天努力改造，該研究修正了傳統「基因決定論」。研究成果刊登於最新一期台灣時間1月19日凌晨發布的《[自然遺傳學 \( Nature Genetics \)](#)》期刊網站。

該研究觀察114對同卵雙胞胎以及80對異卵雙胞胎，分析其白血球、直腸與口腔細胞的基因體甲基化分布，發現「同卵雙胞胎的基因體甲基化相似度高於異卵雙胞胎。」意含基因體自身的DNA序列之外，DNA甲基化差異也具有遺傳潛力；進一步來說，這兩項遺傳因子中，基因體自身DNA序列不可改變，但是透過後天的行為習慣的改變，甲基化卻是可逆的，這對於傳統相信基因決定一切的結論提出挑戰。

深入資料：

1. ["DNA methylation profiles in monozygotic and dizygotic twins"](#) in Nature Genetics.
2. [中央大學生物資訊與系統生物研究所](#)
3. [中央大學校園新聞 2009/01/21](#)
4. [自由時報電子報 2009/01/21](#)

[BIOTECHNOLOGY] NCU Methylation Study Proposed A New Challenge to Traditional Genetic Determinism

The international study on twins in which the Assistant Professor Sun-Chong Wang at the Institute of Systems Biology and Bioinformatics, National Central University, takes part, finds that, beside of DNA sequence, the distributional variation of DNA methylation, i.e., the chemical modification of DNA, is also a factor for interpersonal differences, especially between monozygotic (MZ) twins. Particularly the methylation is an epigenetic factor, i.e., a factor about how genes might interact with their surroundings to produce a (or some) phenotype(s); this finding corrects traditional genetic determinism. The result of the study is presented, on the daybreak 19th-Jan. (Taiwan time), in [Nature Genetics](#).

The study conducted a DNA methylation analysis in white blood cells (WBC), buccal epithelial cells and gut biopsies of 114 monozygotic (MZ) twins as well as WBC and buccal epithelial cells of 80 dizygotic (DZ) twins using 12K CpG island microarrays. An intraclass correlation (ICC)-based comparison of matched MZ and DZ twins showed significantly higher epigenetic difference in buccal cells of DZ co-twins, which implies that, beside of the DNA sequence, the DNA methylation obtains heredity potentials as well. Furthermore, DNA sequence is unchangeable, while methylation is changeable through behavioral and habitual efforts. Thus the study raised a challenge to the traditional belief that genes have determined everything.

Further Information：

1. ["DNA methylation profiles in monozygotic and dizygotic twins"](#) in Nature Genetics
2. [NCU-ISBBI](#)
3. [NCU Campus News2009/01/21](#)
4. [Liberty Times Electrical Paper 2009/01/21](#)

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